Phenom Cogn Sci
DOI 10.1007/s11097-012-9256-0

Phenomenal consciousness, attention and accessibility

Tobias Schlicht

Abstract This article re-examines Ned Block's (1997, 2007) conceptual distinction between phenomenal consciousness and access consciousness. His argument that we can have phenomenally conscious representations without being able to cognitively access them is criticized as not being supported by evidence. Instead, an alternative interpretation of the relevant empirical data is offered which leaves the link between phenomenology and accessibility intact. Moreover, it is shown that Block's claim that phenomenology and accessibility have different neural substrates is highly problematic in light of empirical evidence. Finally, his claim that there can be phenomenology without cognitive accessibility is at odds with his endorsement of the 'same-order-theory' of consciousness.

Keywords Consciousness · Cognitive access · Attention · Working memory · Global workspace · Neural correlate of consciousness

Any empirical investigation of consciousness needs to be preceded by a conceptual clarification of the phenomenon under investigation. That is, in order to determine the neural basis of our rich conscious mental life, one needs a notion (or notions) of consciousness, which is both true to the phenomenal facts and can be operationalized in experimental research. This project has proved to be difficult not only because consciousness is an umbrella term used to cover more than one phenomenon but also because researchers from different disciplines approach the problem in different

The material in this paper has been presented at various occasions and I would like to thank the audiences for the feedback that I received. I am especially grateful for Ned Block's comments at the meeting of the *Association for the Scientific Study of Consciousness* in Taipei, 2008 where I first presented this paper. For valuable discussions I also thank Anne-Sophie Brüggen, Max Coltheart, Santiago Arango-Muñoz, and again Ned Block. Finally, I would like to thank an anonymous reviewer for valuable suggestions regarding an earlier version of this paper.

T. Schlicht (✉)
Institut für Philosophie II, Ruhr-Universität Bochum, Universitätsstr. 150, GA3/29, 44780 Bochum, Germany
e-mail: tobias.schlicht@rub.de

Published online: 12 April 2012

ways. While some empirical researchers bypass conceptual issues preferring to use a common sense notion assimilating consciousness to wakefulness (Crick and Koch 1990), others have offered various distinctions (cf. the overview in Van Gulick 2004b). Such conceptual clarification has been and still is foremost a philosophical task. This paper is concerned with one central and much-discussed distinction, proposed by Ned Block (1997), separating phenomenal consciousness (or *phenomenology*, for short) from access-consciousness (or *accessibility*, for short). While this has found an enormous acceptance among philosophers and scientists alike, and had a huge impact on current discussions about consciousness, it is not clear that it really constitutes a distinction of two *kinds* of consciousness as Block claims it does. This distinction is important partly because if Block is right, then there is not only a large part of our mental life that is inaccessible to us, namely the unconscious part; in addition, even a large part of our *conscious* mental life will then be inaccessible to us, since he argues that there are phenomenal yet inaccessible experiences. What this means will be explained shortly. It is important to note that this is not only a verbal issue, since it has obvious methodological consequences for a scientific investigation of consciousness. More specifically, since accessibility is closely associated with focal top-down attention, the viability of the distinction at issue decides whether and how experimental work on attention can teach us anything about consciousness. What's more, data drawn from experimental setups usually rely on a subject's report about what they *think* they are conscious of. Since a report presupposes cognitive access, such a report can only feature those items that are both conscious and accessible to the subject. Regarding their putative phenomenal yet inaccessible experiences the subjects' reports remain silent. Thus, Block's claim has important ramifications for consciousness research. Therefore, this article re-examines this distinction in the light of Block's recent argument to the effect that these are not only two different concepts of consciousness but that they also have different and non-overlapping neural substrates (Block 2007, 2011).

It will be argued that the way Block draws the distinction is not only insufficiently motivated but also has problematic methodological consequences. Thus, after recounting Block's distinction in the first section, several objections to it will be put forward: In the second section of the paper, a plausible yet more conservative interpretation of the crucial psychological data Block invokes in support of his claim is outlined. This jeopardizes Block's contention that his interpretation is an inference to the *best* explanation. Since this alternative interpretation as well as Block's notion of cognitive accessibility trade on the relation between attention and consciousness, the third section is devoted to this topic. Finally, in section four it is shown that Block's claims regarding the relationship between phenomenology and cognitive accessibility are in tension (if not incompatible) with his acceptance of the same-order-theory of consciousness.

Phenomenal consciousness vs. access consciousness

According to Block (1997), phenomenal consciousness is 'experience'. A phenomenally conscious (henceforth, phenomenal) state is one with experiential properties in virtue of which there is something that it is like to have it or to be in it. Of course, this

characterization alludes to Nagel's (1974/1997, p. 519) famous characterization of the subjective character of consciousness *as such*, according to which "the fact that an organism has conscious experience *at all* means, basically, that there is something it is like to *be* that organism". Paradigmatic phenomenal states are sensations like pain, which exhibit a certain feel. A further characteristic feature of a phenomenal state is, according to Block, that "one is in some way aware of having it", i.e. its "content is in some sense 'presented' to the self"; it exhibits what Block calls "me-ishness" (2007, p. 484). This is to say that phenomenal consciousness is essentially a first-person-phenomenon. While some philosophers claim that this feature can only be conferred to a representation by *another* state being *about* or representing this first one (Rosenthal 2004, Lycan 1996), Block favors the so-called same-order view according to which phenomenal states are "self-presenting" (cf. Brentano 1874, Kriegel 2009). That is, a phenomenal experience is supposed to be "reflexive in that it consists in part in an awareness of itself" (Block 2007, p. 485). But as Block uses the term, phenomenal properties are "distinct from any cognitive, intentional, or functional property", where 'cognitive' means "essentially involving thought" and 'intentional' is equated with being about something (1997, p. 381). This is in basic agreement with Nagel's contention that this subjective character of experience is "not analyzable in terms of any explanatory system of functional states, or intentional states" (1974/1997, p. 519). One of the main points shared by both Nagel and Block is to point to an aspect of consciousness, namely, its subjectivity, which apparently cannot be accommodated by either functionalistic or physicalistic theories (although Block is more optimistic than Nagel that reductive physicalism is true). For this reason, many philosophers and scientists agree that there is an "explanatory gap" (Levine 1983) between conscious experience and any functional or physical property.

Block defines another notion of consciousness, namely access consciousness, in terms of a state's causal effects within a cognitive system: A perceptual state is access-conscious if its content is available for the executive systems of reasoning and behavior, or more specifically, "if it is poised for free use in reasoning and for direct 'rational' control of action and speech" (Block 1997, p. 382). Paradigmatic access-conscious states are beliefs and desires, hopes and intentions, whose representational content can be expressed using a *that*-clause, as in 'believing that physicalism is true'. States like these can guide the consuming system's rational thought, speech and action in virtue of what they are about.[1] Access-consciousness is thus a functional notion. In Block's usage, "poise" is an "intermediate" notion between mere availability for use and actual use. He rejects Tye's (1995) use of this notion as the crucial factor in his representationalist account of *phenomenal* consciousness, since Block thinks that the latter cannot be exhaustively analyzed in terms of representational (or intentional) content. More recently, Block (2002) characterized access-consciousness (or accessibility, for short) in terms of the global neuronal workspace theory (Baars 1988, Dehaene and Naccache 2001). According to this model, our perceptual systems supply representations to consuming mechanisms, which are responsible for reporting, reasoning, evaluating and other functions. Those

[1] Block also allows sensations like pain to be representational in this sense, but his point is that they need not be and even if they were, then this would not be all there is to them.

representations, which are 'broadcast' into the global workspace and are thus immediately available for such mechanisms, count as access-conscious.[2]

Block mentions three main differences between these two notions of consciousness, phenomenology and accessibility: The first difference regards the content of the relevant conscious experiences. Access-conscious mental states are those states which make us conscious *of* something—they have representational content. While an access-conscious state is necessarily representational and conscious in virtue of its representational content, a phenomenal state may be but need not be representational in this sense. Nevertheless, Block grants such non-representational phenomenal states a kind of content, which he calls phenomenal content. A phenomenal state is conscious in virtue of its phenomenal content. This content is supposed to be the "totality of the state's experiential properties, what it is like to be in that state" (1997, p. 383). The second difference is that, as mentioned already, accessibility is a functional notion whereas phenomenal consciousness is not: "what makes a state access-conscious is what a representation of its content does in a system" (1997, p. 383), whereas phenomenology is what consciousness *is*. Finally, the third difference is that there is something essential that all tokens of a phenomenal state type like pain have in common, namely, a certain feel. By contrast, an access conscious state, which is accessible now, may not be so at a later time such that its accessibility is not as essential to it as a pain's feeling a certain way is essential to its being a pain (since, arguably, once something does not *feel* like pain, it isn't pain).

On the basis of these characterizations and differences, Block mentions a few examples to illustrate that and "how it is at least possible to have access-consciousness without phenomenal consciousness and vice versa" (1997, p. 382). Block's interpretation of these cases is crucial since it is supposed to motivate his claim that it is a *conceptual* difference instead of being merely a difference in degree among conscious states of the same kind. Bear in mind that Block intends these cases to be merely *conceptually* possible, since he acknowledges that in most normal cases, the two forms of consciousness occur together, which is the reason why it is so easy for researchers to conflate the two. But one may of course provide reasons to reject this separation of accessibility from phenomenology. Therefore, we need to have a closer look at how Block motivates these cases and whether they can support the claim that one can occur without the other.

Access without phenomenology? Why call it conscious?

Blindsight-patients suffer from damage in primary visual cortex resulting in there being a region in their visual field where they do not consciously perceive any stimuli (Weiskrantz 1986). Although they deny seeing anything in this region, they can nevertheless make reliable guesses as to which stimuli are presented when forced to choose among a small number of alternatives. This suggests that the visual information is processed in their brains although it remains *unconscious*—in *both* senses of the term considered here: For, arguably, neither is there anything that it is

[2] In addition, Block distinguishes a form of reflexive consciousness which he associates with a higher-order thought model (Rosenthal 2004), and self-consciousness in the sense of a sophisticated knowledge of one's own mental states, presupposing the possession of the concept of 'self'.

like for these patients to see any of the stimuli, nor would they, for example, voluntarily report or grasp an object presented in their blind field. Thus, blindsight is a paradigm case of subliminal perception.

Sharing this interpretation of blindsight, Block constructs a putative case of accessibility without phenomenology by asking us to imagine a *super-blindsight*-patient, differing from actual blindsight patients in his ability to spontaneously and voluntarily guess and report what—apparently—he does not see: "Visual information from his blind field simply pops into his thoughts in the way that solutions to problems [do]" (1997, p. 385). Although the content of the relevant perceptual representation is poised for report and thus accessible in this case, it is not phenomenal, according to Block, since there is still nothing it is like for the 'super-blindsighter' to see the stimuli. It is crucial for Block's distinction to constitute a distinction of kinds that it is possible for representations to be merely accessible without at the same time being phenomenal. But even if one may grant such cases to be conceptually possible, it is not clear what would motivate us to categorize this accessibility as a kind of *consciousness*. After all, such a representation is *nothing for* the subject, although it guides his reasoning, reporting and action. There is nothing it is like for him to have it. Thus, it doesn't exhibit the me-ishness characteristic of phenomenology. That is, the putative situation is that although you have a certain thought, belief or desire with a specific representational content and you report and act on it and can use it in your further reasoning, it is supposed to be nothing for you to have this thought, belief or desire. Importantly, as a (supposedly) *conscious* representation, it is *not* subliminal either, since its effects on reasoning and guiding action are not supposed to be unconscious like in priming-experiments or in cases of "normal" blindsight. Since there is nothing for the superblindsight-subject to have access to the relevant information and to have the resulting belief, this access may just as well be enjoyed by a module in a robot. It need not necessarily be treated as a (first-person) phenomenon on the personal level at all. Not being phenomenal, this thought, belief or desire is not supposed to be self-related or implicitly self-given, not subjective in the sense of involving a reference to the subject of experience. But then it seems that it is better treated as an unconscious information-bearing computational brain state. Block faces a dilemma: If he construes accessibility as the access that a subject of experience has to a representational content, then it is simply unmotivated to say that this should *not* involve any of the characteristics of phenomenology. But if he construes accessibility the way he actually does in this thought experiment, then it is not clear why we should treat it as a case of consciousness instead of treating it as a kind of unconscious access that some brain module has to a representational content. One might argue that Block could happily embrace the second horn of the dilemma. Yet, it seems like a strong concession to the functionalist theory of consciousness that he so vehemently opposes in his writings. Since the criterion for something to count as conscious in the case of the putative super-blindsighter is so weak, it would simply lead to a proliferation of systems that need to be granted a *conscious* access to information. A further problem is that in some cases, blindsight boils down to superblindsight in the sense that "prompting" patients to guess does not always seem necessary. As emphasized by Overgaard (2011, p. 474), blindsight patient TN, investigated by de Gelder et al. (2008), is capable of walking down a corridor without bumping into obstacles, yet without being aware that he actually takes great care to go

around them. Yet, Block's interpretation of blindsight patients is that they are neither phenomenally nor access conscious.[3]

The upshot of this discussion is that the fictitious case of super-blindsight may very well be regarded as an unconscious access to a representational content, exercised by a module of the brain, leading to behavioural effects and possibly even affecting what is consciously (phenomenally) experienced (thus rendering it a case of "normal" blindsight). But I see no motivation to consider this access as a form of consciousness independently of this thought experiment. Since Block does not offer any other arguments for his claim that mere accessibility (devoid of any phenomenal characteristics) is a kind of consciousness, his case seems quite weak, especially since he doubts that access without phenomenology is *empirically* possible at all.[4] What's more, when saying that "phenomenology" denotes what consciousness *is*, while "accessibility" points to what consciousness *does*, Block seems to point at two aspects of the *same* phenomenon rather than two separate *kinds* of consciousness. In this section, the aim was to cast some initial doubt on the plausibility of divorcing phenomenology from access and of construing mere access as a kind of consciousness.

Phenomenology without access? Says who?

What about cases of phenomenology without accessibility? In light of Block's recent work, this possibility is very controversial,[5] and, arguably, more important in the context of empirical investigations of consciousness since it posits a kind of consciousness "that the subject not only does not know about, but … cannot know about" in certain circumstances (Block 2007, p. 498). Block (1997) initially argued that it is, again, at least conceptually possible that the neural bases of phenomenology and accessibility be distinct such that one may be impaired leaving the other one intact. This possibility allows for an experience being phenomenal yet inaccessible. To illustrate this, Block provides the following example:

> Suppose that you are engaged in intense conversation when suddenly at noon you realize that right outside your window, there is—and has been for some time—a pneumatic drill digging up the street. You were aware of the noise all

[3] Overgaard (2011) also points to the unresolved issue whether blindsight patients actually do have residual visual phenomenology on the basis of their reports regarding a "feeling of knowing" what there is in their visual field, indicating a correlation between their feeling and good performance. Yet, for the purposes of this discussion, this issue is not problematic for the following reasons: (1) Block himself treats blindsight as being unconscious *tout court*, (2) the possibility raised by Overgaard's interpretation of various reports does not drive a wedge between phenomenology and accessibility, and (3) this possibility would merely amount to a case of what Koch (2004) calls "gist perception" (see below). In any case, if there is residual phenomenology, then it is merely a "degraded conscious vision", as Overgaard acknowledges, not a full-fledged phenomenology of details. For Block's overall argument to go through, it would have to amount to a "rich" visual phenomenology (more on this in the next section).

[4] Block himself takes cases of A-consciousness without P-consciousness to be empirically *unlikely* (personal communication).

[5] The fact that the first possibility is not so much-discussed might have to do with the fact that functionalism is still the dominant account of the mind; and for functionalists (like e.g. Dennett 1991), the possibility of access without phenomenology is, of course, very welcome since it is, in their view, what is in fact the case.

> along, one might say, but only at noon are you *consciously aware* of it. That is, you were p-conscious of the noise all along, but at noon you are both P-conscious *and* A-conscious of it. (1997, p. 386f)

There are different ways to interpret this example. One of them proceeds in terms of attention and a difference in richness of content:

(1) While *before* noon you were only dimly conscious of the noise because your conscious representation had merely an indeterminate (or generic) content, *at* noon you focused your attention on it and were conscious of a more specific determinate content, focal attention allowing you to experience it as a noise of a pneumatic drill etc. This is not Block's interpretation, since he ultimately argues for the case that we can enjoy a very rich and detailed phenomenology in the absence of cognitive access to this detail. This will become clear below.—Thus, Block's phenomenal, yet not accessible, representation is not to be identified with what Koch (2004, p. 165) calls "gist perception", namely, "a succinct summary of what is in front of me, devoid of details". This kind of experience is exemplified rather by Armstrong's (1981) famous example of the distracted truck driver who does not attend to the road (because he is focused on a conversation say, or lost in thought), but nevertheless manages to avoid accidents and arrive at his destination safely. Supposedly, although the driver does not attend to his surroundings, he consciously perceives the gist of what's there, presumably without being able to conceptualize what he perceives, e.g. to identify the brands and colors of the cars in front of him etc. Clearly, it is plausible to grant him some awareness of his surroundings (otherwise he would plausibly have had an accident), so the truck driver does not merely subliminally process the information about his environment. But it is not equally plausible to grant him a conscious representation of the environment with the same specific detail it would have in case he had attended to the road.

(2) Alternatively, *before* noon, you (or more specifically, something in your brain) merely subliminally detected or registered the noise but you didn't consciously experience it, while *at* noon the neural activation representing the noise suddenly transcends a certain threshold (or gets broadcast to other mechanisms in the brain), thus making you conscious of the noise. Since on this interpretation, you are *not* conscious of the noise before noon, this is also not what Block has in mind.

(3) A third alternative is that only *at* noon do you become aware of having the conscious experience of the noise produced by the drill outside. Since phenomenology (not accessibility) is already supposed to partly consist in such awareness, as I hinted at above, this cannot be Block's view either.

(4) Finally, and this is what Block actually claims, *the same determinate and specific representational content* of the noise outside (in all its detail) which you only have cognitive access to *at* noon, has been phenomenally conscious all along. That is, Block claims that you consciously experienced the noise of the drill in its specific detail *both before and at noon*, the difference being that you couldn't make use of it—or access this phenomenal experience—*before* noon. The question is whether this last interpretation of what's going on is better and

more accurate than its alternatives.[6] Admittedly, that this is what Block (1997) actually claims is left somewhat unclear in this example, but it is a central claim in his recent publication (Block 2007) that what is phenomenal without being accessible *before* noon is a representation having *the same content* as what is both phenomenal *and* accessible *at* noon. In his discussion of Sperling's (1960) famous experiment, to be discussed in the next section, he concludes from the subject's reports and performances that a representation with the specific content C being phenomenal and accessible at t_2 must have been phenomenal (yet not accessible) at t_1 (before t_2). The next section examines and rejects Block's argument for this claim. After that, another interpretation along the lines of the first alternative above is developed.

Does phenomenology overflow accessibility?

Recently, Block (2007) has put forward an argument purporting to show that (1) phenomenology "overflows" cognitive accessibility, i.e. that we are phenomenally conscious of much more specific information than we can cognitively access. This claim is based on an interpretation of experimental data, and he uses it to support his further claim that (2) this psychological phenomenon can only (or at least best) be explained by the assumption that the neural processes realizing cognitive accessibility are not constitutive of the neural processes underlying phenomenology (2007, pp. 489, 491). He arrives at this conclusion by way of an inference to the best explanation. In this section, the experimental data that Block mentions in support of his first claim shall be introduced and discussed in greater detail. In the following section, we will have a look at alternative interpretations, which leave the link between phenomenology and accessibility intact. We shall return to the second claim later in the context of a discussion of the relation between attention and consciousness (Attention and consciousness section).

In a number of now classical experiments, George Sperling (1960) was able to determine that working memory is limited to a certain number of items. He presented subjects with an array of letters (e.g. twelve letters arranged in three rows) for 50 ms (or longer) using a tachistoscope and asked them what they saw. Although participants generally claimed (reported) that they could see all or almost all the presented items, the correct responses usually did not exceed 4 to 5 items regardless of the number of items presented (and even regardless of the duration of the presentation). In order to find out whether the subjects really saw *all* the letters, Sperling had the ingenious idea to ask participants to give only a partial instead of a total report. After the brief presentation of the array, a high-, medium- or low-pitched tone was produced and the subjects were asked to reproduce only either the first, second or third line according to the pitch of the tone. Of course, the effect of the tone was to direct their attention to one of the rows. In this condition, the subjects performed much better, generally being able to give an accurate partial report of the subset of letters in question. Since the subjects did not know in advance which line they would have to report, Sperling acknowledged that immediately after the end of the presentation, the information necessary to recall all the letters had to remain accessible to

[6] Of course, I do not claim that the alternatives mentioned are exhaustive. There may be others but it is not the point of this paper to investigate this example in detail. I will argue for the first option later in the paper.

them for a short time after the presentation. Thus, in a way, the subjects were right to claim that they saw all the letters.

Another important, more recent set of data comes from experiments done by Landman et al. (2003) who combined Sperling's paradigm with a change blindness paradigm. They asked participants to focus on a dot in the centre of the screen around which a circular array of eight rectangles was arranged, some horizontally, some vertically oriented. In the presentation, this screen was followed by a blank for variable periods of time after which another array of rectangles appeared with a line pointing to one of the eight items which may or may not have changed its orientation. The participants were then asked whether this rectangle had in fact changed its orientation. The result was similar to Sperling's result, i.e. subjects reported to see all the rectangles but were able to report only about four of them. In another condition, the indicating arrow was presented already on the first screen. Then, subjects performed much better, presumably since they could already focus their attention on that particular rectangle. In a final condition, the indicating arrow appeared during the intermediate blank screen. But (presumably) due to the informational persistence of the whole array, the participants performed almost as good as in the second condition. (The task seems somewhat easier than Sperling's task, since the rectangles all had the same form, whereas in Sperling's paradigm, the alphanumeric characters were all different.)

Now, Block suggests the following interpretation of Sperling's experiment:

> Although one can distinctly see all or almost all of the 9–12 objects in an array, the processes that allow one to conceptualize and identify the specific shapes are limited by the capacity of 'working memory', allowing reports of only about 4 of them. That is, the subject has experiences as of specific alphanumeric shapes, but cannot bring very many of them under specific shape or alphanumeric concepts (i.e. representations) of the sort required to report or make comparisons. The subject can bring them under a general concept like 'alphanumeric character'—which is why the subjects can report that they have seen an array of alphanumeric characters—but not under the more specific concepts required to identify which alphanumeric character. (Block 2007, p. 487)

Block's interpretation of Landman's data is analogous to his interpretation of Sperling's data, explaining the limited performance in the identification of items in terms of working memory constraints: The "capacity" of phenomenology is apparently "greater than that of the working memory buffer that governs reporting" since subjects have "persisting experience as of more specific shapes" than can be brought under the specific concepts (specifying their orientation) "required to report or compare those specific shapes with others" (2007, p. 489), although their experiential content can be brought under a somewhat more generic, less determinate concept (e.g. "rectangle"). To sum up, Block's claim is that in these two experiments what is both phenomenal and accessible is the generic information that there is an array of items (letters or rectangles), but what is only phenomenal yet inaccessible is the representation of the specific items (letter identities or rectangle orientations) making up the array.

I agree with many aspects of Block' assessment of Sperling's experiment in the longer quote above, in particular with the claim that the subjects' performance has to

do with the limitation of working memory. Also, I think it is right that they can bring the items under the general concept "letter" or "rectangle" but not under more specific concepts. But I reject Block's claim that in the initial condition, subjects are phenomenally conscious of all the "*specific alphanumeric shapes*", i.e. that they have phenomenology as of more specific letters than they can access and report (in Sperling's experiment), and, analogously, of all specific orientations of the rectangles in Landman's experiment. My reason for this rejection is basically that there is an alternative interpretation of the data that does not rely on this strong separation of phenomenology from accessibility. Although consciousness is a mongrel phenomenon that can take on different forms differing in complexity, subjectivity remains the constitutive feature in virtue of which we subsume all these varieties as conscious experiences. This subjectivity includes both a phenomenal feel and access to the content of the experience in question. Unless a strong case can be made for including a notion of consciousness that lacks this feature of subjectivity, it is more parsimonious and explanatorily more fruitful to work with this more unified notion of consciousness. And the claim of this paper is that Block has not made this case. His argument for *conscious* access without phenomenology has been shown to be unconvincing, and in order to show that his case for phenomenology without accessibility is also unconvincing, an alternative interpretation will now be developed which has the advantage of solely relying on sources that Block himself uses.

Another look at the data

Kinds of stimulus persistence and kinds of content

Block's claim is, as has already been mentioned, that in the two sets of experiments subjects have phenomenal experiences as of all the *specific items*. This is clear from his assessment of Landman's experiment: "What is both phenomenal and accessible is that there is a circle of rectangles. What is phenomenal but in a sense not accessible, is all the specific shapes of the rectangles" (2007, p. 488). This, of course, drives a wedge between phenomenology and accessibility. But then he also notes several times that what is reflected in the reports, i.e. what subjects generally claim to see, is "an array of alphanumeric characters" (p. 487); that they "maintain a visual representation of the whole array" (p. 488); that "subjects' reported phenomenology is of seeing all or almost all of the items" (p. 488). Thus, what subjects claim to see is an "array of letters" or a "circle of rectangles". Formulated in this way, these reports do *not* suggest that subjects claim to be consciously experiencing each item in detail. What the subjects apparently do *not* claim, but what Block would need them to claim in order to support his interpretation, is that they see—*regarding each specific item*—that it is this or that specific letter, or, in Landman's experiment, that this or that specific rectangle on the left is oriented horizontally, while the one below it is oriented vertically, and so on (Byrne et al. 2007). They do not seem to claim that they saw, for example within the array presented by Sperling, that the first alphanumeric character in the bottom row was a K, that the alphanumeric character in the upper left corner was an M, and so on. (Neither did I find mention of such reports in Sperling's original paper.) But Block interprets the reports in this way, since

otherwise it would not be clear what he means by an 'experience as of a specific item'. The report that they see all the letters may also be influenced by the experimenter's introduction to the experiment, since the subjects might already have *expected* that they will be presented with an array of letters. The first point to make is thus that the reports do not support this strong interpretation, and consequently, not Block's claim.[7] But of course, this is not enough to reject Block's interpretation.

Therefore, an alternative interpretation of the Sperling-data needs to be presented. This relies heavily on two distinctions that Block accepts. The first distinction is borrowed from Coltheart (1980). Coltheart distinguishes three senses in which a stimulus may "persist psychologically" after its offset. First of all, the neural activity evoked by the stimulus may last longer than the presentation of the stimulus (*neural persistence*). Secondly, the information about certain properties of the stimulus may be available to the perceiver for some time after stimulus offset (*informational persistence*). Finally, the stimulus may even remain consciously visible after the stimulus has disappeared (*visible persistence*). Coltheart argues that Sperling's data can be interpreted as demonstrating informational persistence, and that in general, visible persistence depends upon both other types of persistence, while the former do not presuppose the latter. Clearly, Block is claiming that Sperling's and Landman's experiments demonstrate that all stimuli also remain visibly persistent, since he holds that all items are phenomenally experienced in detail.

The second distinction to be introduced is also endorsed by Block himself and regards richness of content. The content of a mental representation may be either generic and largely indeterminate or specific and thus more determinate. For example, you may visually experience something, which you can identify as a face (generic content) although you cannot identify it (for whatever reason) as your mother's face (specific content). This distinction is one of degree, not one of two poles.[8] But for the purposes of this discussion, we may confine ourselves to the two ends of the spectrum, namely, the generic and largely indeterminate content "an array of letters" and the specific and more determinate contents (being the sum of contents having roughly the form) "the specific letter M", "the specific letter C" and so on.

[7] It might appear strange to the reader that Block relies on subjective reports at all, since these are not the kind of data that could support a case of phenomenology without access. Since any report relies on cognitive access, it cannot inform us about the presence of an inaccessible conscious representation. A report about such a representation would be indistinguishable from a report about a totally unconscious representation, e.g. "I see nothing". In a recent paper, Cohen and Dennett (2011) emphasize this point and argue that theories like Block's which completely dissociate phenomenology from function "are inherently unfalsifiable and beyond the scope of science, because inaccessible conscious states are intrinsically off-limits to investigation" (ibid., 358). The problem for Block is that he obviously thinks that phenomenology can be scientifically investigated; the problem for Cohen and Dennett is that their own argument could be turned against them to the effect that they have thereby shown that functionalism about consciousness is false: since "science necessarily relies on cognitive functions in order to investigate consciousness", but consciousness is not exhausted by those functions, consciousness cannot be approached scientifically.

[8] This is relevant, since the specification of content provides the answer to the question what the subject is supposed to have access to. Regarding Sperling's experiment and Block's claim that subjects are phenomenally aware as of all the specific items, one may ask, for example, what an 'item' is. There are of course many ways to single out something as an item. Any of the 12 letters may count as an item, but also the whole array counts as an item. Moreover, there are various ways to group items to get other items (e.g., a row of four letters may count as an item). Block obviously identifies a single letter as the relevant specific item.

You can combine these distinctions between kinds of persistence and kinds (or degrees of richness) of content in various ways and apply them to the data of the Sperling-experiment. Everyone can agree that the stimuli at least *neurally* persist, i.e. that the experiment demonstrates neural persistence of both generic and specific content. Moreover, the subject's reports also indicate informational as well as visible persistence of the generic content ('an array of alphanumeric characters'). Thus, the dispute concerns the question whether the experiments also demonstrate *visible* instead of mere *informational* persistence of specific content—in addition to the visible persistence of the generic content. Block argues for visible persistence of specific content, that is, subjects are supposedly not only phenomenally conscious of the representation with the generic content that there is an array of letters. Block takes them to be also phenomenally conscious of the individual representations with the specific contents specifying the identities of the letters; they just cannot access (most of) these individual representations. An alternative interpretation of the experimental data that does not divorce phenomenology from accessibility may then proceed along the following lines. (For simplicity of discussion, we may ignore neural persistence, since it is presupposed by both other kinds of persistence as an enabling factor.) As already mentioned, in the *initial* condition of Sperling's experiment the subjects report that they see "an array of letters", and this content is rather generic and indeterminate, since it contains nothing about the specific identities of the letters. Arguably, this content is both phenomenal and accessible. That is, it is reasonable to hold that with respect to generic content, all three kinds of persistence apply. There is something it is like for the subjects to see a whole array of letters and they can also access and report this information. They can even apply the generic concept "LETTER" to all the items, although this may be partly due to the fact that they already *expected* to see letters on the screen, depending on the instruction of the experimenter. In the *partial* report condition, again, both informational and visible persistence of the generic content 'an array of letters' after stimulus offset apply and account for the subjects' report that they see the whole array.

But this cannot be the whole story. In his reply to critics, Ned Block correctly points out that "the objectors have to agree that before the cue, there are *specific* (not just generic) visual representations of all or almost all of the 8 to 32 items…" (2007, p. 531) because otherwise we cannot explain that the subjects can access around four of them in any case. I agree that there have to be specific visual representations of the letters, at least on the level of neural processing, and they may even informationally persist. But acknowledging this neither implies that these specific representations are phenomenal, nor that they are phenomenal before (and independently of) being accessible. It is not clear, as Block might argue, that the successful partial reports can only be explained by postulating *visible persistence* of the stimulus. To explain the data it suffices to use the notion of *informational persistence* plus the power of focal attention: In virtue of the informational (not visible!) persistence of all the specific letters, subjects can consciously access any of them, or a subset of the array, by turning their attention to them, led by the auditory signal. As Block acknowledges, attention can make us conscious of a stimulus, which was formerly unconsciously processed. This focal attention amplifies a subset from subthreshold to suprathreshold, which is a remarkable feat; but that this is a possibility has been demonstrated by Carrasco et al. (2004), and it is also mentioned and accepted by Block (2007, p.

492). Moreover, Landman's experiment also demonstrates that focal attention can allow one to access a representation even after stimulus offset. In one condition, cueing occurs during the blank screen, i.e. after stimulus offset but before the new stimulus appears. Subjects perform just as well as when cueing occurs during presentation of the first stimulus, i.e. no change blindness results. Now, if it is possible that focal attention can provide access to a representation even after the presentation of the relevant information (Landman's finding) and if focal attention can amplify an unconscious stimulus to be consciously perceived (Carrasco's finding), then this is motivation to regard the specific representations of the stimuli before the shift of attention as unconscious. On this more conservative interpretation then, the amplification in virtue of the power of focal attention allows for the accurate partial report. Needless to say, on this interpretation, the link between phenomenology and access remains tight, since subjects have a phenomenal experience of the whole array and can access this generic content. They are not phenomenally conscious of all the specific contents and cannot access all of them. But by shifting their attention to a subset of the unconscious representation of the specific items, this subset can be phenomenally experienced and accessed. According to this interpretation then, in both conditions the contents of the relevant phenomenal representations are accessible, accessed, and, on that basis, reported. The generic content "array of letters" is both phenomenally experienced and accessible. The more determinate specific content of the representations in the partial report condition, such as "the letters in the middle row are R, T, J, and S" say, is both phenomenally experienced and accessible. Finally, as Block concedes, both the less determinate, generic content as well as the more specific contents are conceptual. The former can be brought "under a general concept like 'alphanumeric character'", which allows subjects at least to wonder what specific letter some item might be, as Tye (2009, p. 171ff) points out in his interpretation of the data. And the latter can be brought under the more specific concepts required to identify the letters.[9]

This interpretation in terms of (a) informational persistence of the stimulus, (b) the distinction between generic and specific content, and (c) an act of attention captures the data well enough such that there is no need to subscribe to Block's stronger interpretation that separates phenomenology from accessibility. Moreover, it is questionable whether Block's explanation will hold up (or be equally plausible) if it is applied to slightly different cases. For example, what if the letters are not as neatly arranged in three rows of four letters each, which makes it easy for us to count them, for example? (Indeed, this arrangement seems to make counting unnecessary!) If the letters are scattered around the screen, then it is much less plausible that subjects

[9] Sid Kouider (Kouider et al. 2007) proposes a similar interpretation, but instead of distinguishing between generic and specific content he puts it in terms of fragmented letters which are phenomenally conscious and on that basis also accessible: "subjects have a transient and degraded access to fragments of all the letters in the grid. As subjects are not expecting anything other than letters, fragments are used to reconstruct as many letters as possible" (2007, p. 511). Kouider designed a variation of the Sperling- experiment, where he replaced some of the letters with non-letters or letters being turned on their heads. After offset of the stimulus he presented an array containing both letters which had not been included in the original array, and the turned-around letters which had been presented in the original array. When subjects had to decide whether any of those had been presented in the original array, they generally reported the letter, despite the fact that it had not been presented before, but they did not report the non-letter, which had been included (see also de Gardelle et al. 2009).

should be phenomenally conscious of the exact number and identity of all the items. But it remains plausible that they will be phenomenally conscious of an unordered array of letters, which is predicted by the competing interpretation in terms of generic content. What if one of the items in this array is not a letter but a number, e.g. 8 (which can easily be mistaken for a B)? Is Block ready to claim that in this case, subjects are phenomenally conscious of all the specific items? And how far can we take this? Of how many of the hen's speckles are we phenomenally conscious, only 47 or all 48? Or aren't we merely phenomenally conscious of "a speckled hen"?

Consciousness and content

The weaker interpretation suggested here points to a tight connection between phenomenology and cognitive accessibility and it suggests that while Block's distinction between phenomenal and access-consciousness is wrongheaded, there is a viable distinction to be drawn on the level of content instead of consciousness, which can be used to describe the experimental data at issue. This is the distinction between generic and specific content. In their critical commentaries to Block's article, a number of authors make use of similar distinctions. For example, Sergent and Rees (2007, p. 524) point out that the subjects' good performance on the basis of focal attention to specific items "does not entail … that the earlier 'seeing it all' experience therefore reflects phenomenal experience of all the letters *at the same level of detail*". Naccache and Dehaene (2007, p. 519) distinguish between "approximate content" and something like identificatory content, the difference being essentially a matter of focal attention. Koch and Tsuchiya (2007, p. 510) interpret Sperling's data in terms of "consciousness without top-down attention processing". Similarly, Papineau distinguishes between "scene phenomenology" and "item phenomenology", arguing that Block's argument only "shows that we can have scene phenomenology without item access, but not that we can have scene phenomenology without scene access, or item phenomenology without item access" (2007, p. 521). Grush (2007, p. 504) even argues for a sui generis "generic phenomenology" in contrast to "detailed phenomenology". Finally, Dennett already suggested in his commentary to Block's earlier target article (Block 1997) that the distinction between phenomenal and access-consciousness can be "accommodated under the two rough quantitative headings of *richness of content* and *degree of influence* (Dennett 1997, p. 417). All these distinctions allow for interpretations of Block's pneumatic-drill example and the Sperling- and Landman-data along the lines of the first alternative mentioned in connection with the drill-example, i.e. in terms of the distinction between indeterminate generic content and determinate specific content.[10] None of these interpretations (possibly with the exception of Grush's)

[10] A crucial factor both in the putative examples for phenomenal without access-consciousness and the present alternative interpretation of the data in terms of indeterminate and determinate content is focal attention. In the pneumatic drill-example, attention is initially directed only at the conversation (or the conversation partner), not at the noise outside, which you may be only peripherally aware of since it is outside your focus of attention. But then, at noon, the noise grabs your attention (or you actively direct it towards it), which results in your being aware of the noise as coming from the pneumatic drill outside.

presupposes a distinction of kinds of consciousness, since all uphold a tight connection between phenomenology and accessibility.

It is interesting to note that in recent discussions the motivation for the distinction between phenomenal and access consciousness as initially conceived by Block (1997) has changed considerably. Initially, Block has emphasized that there is a dimension to consciousness, namely, its subjective feel, which is not accommodated by functionalistic theories, since it is distinct from function and non-intentional; access consciousness was introduced as a purely functional notion that does not exhibit any subjective dimension. But the overflow argument trades on a quite different difference between phenomenology and accessibility, namely, the "amount" of content that is computed (experienced) in the respective cases. The capacity of phenomenology is supposed to be higher than the capacity of the machinery underlying cognitive access. Moreover, Block's recent discussions of the distinction suggest that cognitive access is higher-order with respect to phenomenology, and comes after phenomenal consciousness. The idea seems to be that first of all, we can be phenomenally conscious of something, and afterwards—due to constraints of working memory—what we actually access cognitively is somewhat diminished compared to what we initially experienced. That leaves it completely open to debate whether this latter higher-order cognitive dimension of consciousness also contains a subjective dimension. Indeed, to hold that there is something that it is like to have cognitive access to representational content is intuitively more plausible than denying it, i.e. to hold that what I can cognitively access is completely *nothing* to me, in terms of what-it-is-like-ness. To my mind, it seems even more plausible to argue that there is something that it is like to cognitively access what is experienced than to hold that there is something that it is like to experience something, yet not knowing that one experiences it.

Since on the alternative account presented above, the distinction between phenomenal consciousness and access consciousness is replaced by a distinction within the dimension of the contents of experience, it avoids the implausible consequence of access consciousness being both higher-order with respect to phenomenal consciousness while at the same time being totally devoid of subjective character (recall the imagined super-blindsight-patient). This is not to say that consciousness is a monolithic concept. It is still an umbrella term, encompassing a variety of phenomena, which can possibly be hierarchically distinguished, with increasing complexity, culminating in full-blown self-consciousness in Block's sense (presupposing the possession of the concept of 'self').[11] But crucially, since subjectivity is then not confined to only one of them (phenomenal consciousness), as Block would have it, we can have phenomenology on *all* levels of consciousness and self-consciousness. And of course this is plausible, since if phenomenology is understood in terms of Nagel's phrase that there is something it is like *for a subject* to have conscious experiences, where this means that conscious experiences—however complex and with whatever kind of content—are subjective first-person phenomena, then not only sensations are such first-person phenomena but also conscious beliefs, desires, and other propositional attitudes. As long as they are conscious, they exhibit subjective character and are thus something

[11] The concept of self-consciousness may also allow for different levels of complexity and thus encompass various phenomena but this is not the place to elaborate this point further.

for the subject.[12] If one were to categorize mere access to a representation in the absence of phenomenology as a kind of consciousness, then it is their task to make a good case for it.

Instead of identifying phenomenal consciousness with some sort of content (phenomenal content), as Block (1997) introduces it, one should divide the notions of consciousness and content and follow Byrne (2003) and Vosgerau et al. (2008), construing phenomenology as a *property* that some representations possess and others lack. One motivation for this alternative is the observation that my conscious representation of the chair in front of me does not seem to have a different content than my unconscious representation of the chair in front of me. More generally, it seems that all kinds of representational content may be either conscious or unconscious, i.e. there does not seem to be some unique kind of content which is essentially conscious such that it could explain the difference between conscious and unconscious representations. Furthermore, it does not seem clear at all why one should accept a second notion of (phenomenal) content in addition to representational content if, on this usage, in phenomenal content, nothing is presented in a certain way. In general, a visual representation with a certain content may be either conscious (i.e. phenomenal) or unconscious (i.e. subliminal). If it is conscious, then—according to the present proposal—this is so *not* in virtue of its having some further content that it lacked in its unconscious form. Rather, in contrast to an unconscious representation, it exhibits a certain relational property. Another way to put it is to say that phenomenology and content are 'orthogonal' to each other (cf. Vosgerau et al. 2008).[13] In the next section, the crucial role played by attention in the present interpretation of the psychological data shall be elaborated in a little more detail.

[12] Note that this does not imply the view that beliefs and thoughts have qualia. In this context, we can remain neutral on this question. This is so since one need not reduce phenomenal character to qualia, as some philosophers seem to be willing to do. Qualia are supposed to be properties by which two sensations (as of red and as of blue, say) differ from each other. We may call this the 'qualitative character' of an experience, in contrast to its 'subjective character', which is constitutive of conscious experiences tout court (Kriegel 2005). While not all conscious experiences need exhibit qualitative character, they all have the same property in common, namely, their subjective character. The former may very well be analyzed in terms of content, along the lines suggested by Tye (1995). But the present claim is that subjective character may not be so analyzed, since it is not a matter of a further content being added to the representational content of the experience! This is not the place to argue for this claim but see Schlicht (2011) for a discussion of several (unsuccessful) attempts to explain subjective character in terms of content.

[13] In contrast to representationalist approaches (Tye 1995; Dretske 1995; Rosenthal 2004; Lycan 1996; Carruthers 2000), the difference between an unconscious and a conscious representation may be that the latter is integrated in the right kind of way into the subject's transient global experiential state, which also includes information about the overall biological (homeostatic) state of the organism as a whole (Damasio 1999). This proposal is based on the assumption that creature consciousness is not only the necessary basis of phenomenal consciousness, but also (at least partly) constitutive of phenomenal consciousness (Bayne 2011). The resulting dynamic neural state of the organism, which includes not only such "proto-self" structures but also the core correlates of representations in various sense modalities, may then be called the "total state of consciousness" (Bayne & Chalmers 2003) of the organism at a time. Once a mental representation is integrated in the right kind of way, it is phenomenally conscious and can be considered as a modification of the organism's total state of consciousness. Then there is something it is like for the subject to be in this representational state (Metzinger 1995; Van Gulick 2004a; Edelman and Tononi 2000). This is not the place to develop this account in any more detail, but see Schlicht 2011.

Attention and consciousness

What remains to be tested empirically regarding the present interpretation of the experimental data is the role played by attention in the experiments that are crucial for this debate. In addition, the role played by the neural mechanisms underlying attention need be examined to test Block's second claim that the necessary and sufficient neural bases of phenomenology and attention/accessibility are different and non-overlapping. This is because Block associates the mechanisms of attention with access rather than with phenomenology. Block (2002) accepts the global workspace model (Baars 1988; Dehaene and Naccache 2001) as an account of accessibility but rejects it as an account of phenomenology. Since attention plays a crucial role for cognitive access in the global workspace model, attention is closely associated with access and contrasted with phenomenology. In defending the workspace model for consciousness, Dehaene et al. (2006, p. 205) hold the quite strong claim that "without attention, conscious experience cannot occur". Accordingly, attention plays a central role in their model of consciousness. They write: "Both bottom-up stimulus strength and top-down amplification … are jointly needed for conscious perception, but they might not always be sufficient to cross the threshold for conscious perception" (2006, p. 206). They define a preconscious or potentially conscious state as one which carries enough information to become a conscious state, "but is temporarily buffered in a nonconscious store because of a lack of top-down attentional amplification" (2006, p. 207). On this model, these representations need to be attended to in order to be accessed (they are accessible simply by being preconscious).

Block is opposed to the workspace model as a model of phenomenal consciousness. In oversimplified terms, his claim is that while the neural base of (visual) phenomenology is in the back of the head, the neural base of access is in frontal areas of the brain. Empirical evidence about the neural mechanisms of attention and the workings of attention in general is of course crucial for the evaluation of this claim since the sufficient neural base of phenomenology must not involve the neural mechanism of focal attention which is associated with access. In this section, the role of attention both for phenomenology and for Block's claim shall be examined more closely, since it seems that a methodological problem arises when one tries to defend this claim using empirical evidence.

It is customary to distinguish between (at least the following) two kinds of attention: (1) Looking for a friend in a huge group of people is an example of top-down, volitionally controlled selective attention, which may be described using the searchlight-metaphor. Stimuli in the visual field being in the focus of your attention are illuminated, so to speak, and clearly visible, while items at the periphery or outside the focus of attention are not so clearly perceived (Koch 2004, pp. 153ff). (2) Sometimes a stimulus is so salient that it 'sticks out' from its background and grabs your attention. For example, at a party a friend of yours may attract your attention simply by being the only one wearing a red sweater while everyone else wears a black suit. This is a case of bottom-up attention, which is also exemplified in Block's pneumatic drill-example. At some point, the noise of the drill attracts your attention. For the purposes of evaluating Block's claim and the alternative interpretation of Sperling's data, we need to concentrate on top-down focal attention.

At first glance, recent experimental evidence seems to support Block's claim regarding the different neural bases of attention and consciousness. Koch and

Tsuchiya (2007) have argued that attention and consciousness are different processes being realized by different underlying neural mechanisms. Based on experimental data they argue that four cases are possible: (a) Attention and consciousness may occur together, since uncontroversially, attention can make us conscious of novel or unexpected stimuli. (b) Sometimes, in the absence of attention, we do not consciously perceive anything that we can report. Koch and Tsuchiya mention the formation of negative afterimages on the basis of invisible stimuli as an example for this case. (c) Priming is a demonstration of attention not leading to consciousness, because some crucial constraint is not met, e.g. processing time or presentation time of the stimulus. One might also count blindsight as an example of attention without consciousness (Kentridge and Heywood 2001). (d) The last possible case is conscious perception in the absence of attention. A typical example of this is 'gist perception' exemplified by the absent-minded truck-driver who does not attend to the road in front of him but nevertheless manages to drive safely. The case crucial for Block's claim is (d) where consciousness occurs without (or in the near absence of) focal attention. But the case of 'gist' perception is not relevant for Block's argument: since the conscious experience in this case has merely a generic content, it is a succinct summary of what's there, as Koch (2004) describes it. In contrast, Block claims that in Sperling-like paradigms, *specific details* are consciously experienced in the absence of attention and thus in the absence of access. Moreover, he claims that the neural mechanism of attention is not part of the neural base of phenomenology. Thus, what Block needs to show in order to support his claim is that in order to experience specific details, i.e. in order to be phenomenally conscious of specific content, no attentional modulation is required. In apparent support of such a claim, Koch and Tsuchiya (2007) mention experiments where they presented a photograph for merely 30 ms arguing that this is "insufficient time for top-down attention to play much of a role". Nevertheless, subjects were able to "report a summary of the photograph" (2007, 18). Two comments: First, this is only an example demonstrating gist perception and can thus not support Block's claim. Secondly, what's crucial for conscious perception is not so much *presentation time* of the stimulus but *processing time* of the information. And it is clear that for information about any stimulus to lead to conscious perception, it needs to be processed much longer than 30 ms, namely, several hundred milliseconds which is a lot in brain-time (Koch 2004; Libet 2005). Now, the neural mechanisms underlying attention are commonly held to be in frontal areas, just like the mechanisms for access in the global workspace model (see below). In order to demonstrate that activation of visual areas in the back of the head is both necessary and sufficient for visual phenomenology, it would need to be shown that absolutely no interference or modulation from frontal areas is involved or needed during the (relatively long) processing of visual information. Only then could Block's claim be backed that the neural base of phenomenology is completely independent from the neural base of attention.

But the best empirical evidence points in another direction. It suggests that visual information is not only modulated by attention at late stages of neural information processing. Attentional influences on visual information processing have now been demonstrated throughout visual cortex, such that it is hard to regard sensory consciousness as being completely independent from such modulation. Both early and late selective mechanisms are at work, changing how sensory information is

processed.[14] Modulation by attention has been demonstrated already in primary visual cortex (V1), it has been demonstrated in both visual pathways from the beginning, and it increases as one ascends the hierarchy of visual areas (Treue 2001; Kanwisher and Wojciulik 2000). What's crucial is that the source of this modulation by attention on the neural level is generally taken to be based in frontal areas of the brain. Kanwisher and Wojciulik (2000) report that specific fronto-parietal areas are responsible for the influence exerted by top-down attention on the visual processing elsewhere in the visual system. In general, multiple frontal brain areas are associated with attention. According to Corbetta and Shulman (2002), top-down attention and bottom-up, saliency-driven attention are supported by different yet both frontal brain regions. While dorsal posterior parietal and frontal cortex are associated with the first, endogenous kind, the temporo-parietal cortex and ventral frontal cortex support the latter, exogenous kind of attention. On the other hand, Rosen et al. (1999) found a certain amount of overlap among the mechanisms of both kinds of attention. Be that as it may, the upshot remains that (1) the "front of the head" is strongly associated with modulation by attention, and that (2) these areas strongly influence phenomenal experience from the beginning and at all times.[15] The issue is complicated by the fact that "attention" is not a monolithic term, since there are many different kinds of attention. This leaves room for the possibility that although the kind of focal attention that was characterized at the beginning of this section is engaged with some item or primary task, information outside this focus receives different kinds of attention rather than receiving zero attention, namely "distributed, featural, spatial, internal" attention and so on (Chun et al. 2011). This would of course be in line with the empirical evidence mentioned above that attention mechanisms seem to be involved at all stages of visual processing; it just need not be always the same mechanisms.

This evidence considered, of course, makes it unlikely that a neural base necessary and sufficient for phenomenology can be found (roughly) in the back of the head. Now, Block might argue that in Sperling's and Landman's experiments no shifts of attention are involved. But this is not the point. The claim at issue is whether feed-forward processing in visual areas in the back of the head (or even local recurrent processing in Lamme's (2006) sense) is sufficient for visual phenomenology. And the evidence discussed in this paragraph seems to support a negative answer, or at least demonstrates that it may be impossible to demonstrate empirically that visual phenomenology and accessibility (involving attention) have non-overlapping neural bases. It may be that a very brief processing time in visual areas (in the back of the head) which does not allow frontal areas to interfere is too short to lead to conscious perception, while the processing time needed to lead to conscious perception is always long enough for attention mechanisms (in frontal areas) to interfere and thus become part of the necessary and

[14] One may object that this way of talking only makes sense when one presupposes that visual processing is linear and where attention has a place, thereby ignoring the massively parallel and distributed nature of neural processing (cf. Mole, forthcoming). But the obvious reply is that if the information processing is always a two-way affair, with no major direction, then this is even worse for Block's case.

[15] These mechanisms of focal attention in visual processing may play a crucial role in the context of integration of information and reduction of uncertainty. This is therefore relevant for the discussion of the preceding sections. If Tononi (2004) is right that consciousness corresponds to the brain's ability to integrate information, and if information can be defined as the reduction of uncertainty, then a notion of maximally integrated content could be developed, which is content that is fully determined, in contrast to content which is less integrated and thus less determinate.

sufficient neural base of phenomenology. This may be so even though attention and consciousness are different phenomena, as Koch and Tsuchiya emphasize. If attention influences conscious experience from the beginning, then it is not so easy to isolate a neural mechanism for visual phenomenology independent from attention and access.[16]

In the previous section, an alternative interpretation of the experimental data at issue has been provided to cast some doubt on the claim that phenomenology 'overflows' accessibility in Block's sense. The present section was meant to cast some doubt on Block's second claim that the neural machinery of phenomenology is completely independent from the neural machinery of attention and accessibility. I will now turn to my final objection against Block's thesis.

Extinction and the same-order-theory of consciousness

According to Block's characterization of phenomenal consciousness, "it is platitudinous that when one has a phenomenally conscious experience, one is in some way aware of having it", i.e. its content is "in some sense 'presented' to the self"; it "comes with a sense of ownership" (Block 2007, p. 484). According to Block, the me-ishness associated with conscious experiences is the central feature of phenomenology (cf. Phenomenal consciousness vs. access consciousness section above). Block mentions three alternative positions that try to cash out this notion of immediate and automatic awareness of a phenomenally conscious experience (and presumably, Block takes these options to exhaust the spectrum since he describes them as "classes of accounts"). First of all, he mentions Sosa's (2002) deflationary view that "one experiences one's experience just as one smiles one's smile or dances one's dance". Secondly, he mentions and rejects higher-order theories, according to which a mental representation is phenomenally conscious just in case a second distinct and separate (and itself unconscious) representation is about or represents that target representation.[17] Finally, Block mentions and endorses the same-order view, which is in many respects similar to the higher-order view, but 'simpler' in that it rejects the claim that a distinct and separate mental representation is needed. Instead, phenomenally conscious representations are taken to partly consist in an awareness of themselves. Brentano (1874) famously developed a view of this kind by distinguishing two kinds of content. When you have a visual experience as of a face, say, this experience is accompanied by an inner awareness of it. That is, while the primary content of the conscious experience is the face, its secondary content is the act of seeing. In contrast to the higher-order views, these two contents constitute one single experiential state.[18] On this view, unconscious representations are unconscious since

[16] Another source for doubt regarding Block's claim concerning a sufficient neural base of phenomenology "in the back of the head" are studies that highlight activations in prefrontal and parietal cortices in association with conscious experience, see Dehaene and Naccache (2001) and Rees et al. (2002). Whether these activations support the view defended here that attention is involved in visual processing or whether it supports a higher-order theory of consciousness, according to which this kind of activation underlies a non-conscious higher-order thought that renders a visual representation conscious (Lau and Rosenthal 2011), is an open question that cannot be decided here.

[17] This view has been developed in different ways, some take the higher-order state to be perception-like (Lycan 1996), others construe it as a thought (Rosenthal 2004; Lau and Rosenthal 2011).

[18] More recent developments of this position can be found in Kriegel and Williford 2006.

they lack that secondary content; they do not partly consist in an awareness of themselves. Block prefers that view to the higher-order view because it "fits both science and common sense better" (2007, p. 485). In this section, it shall be demonstrated that Block cannot hold on to this view while at the same time accepting the consequences of his reasoning regarding the neural base of phenomenology and his argument of overflow. This can be elaborated in the context of Block's discussion of patient GK who suffers from visuo-spatial extinction as a result of brain injury.

Unilateral brain damage sometimes leads to visuo-spatial neglect. Patients with this disorder systematically ignore the left region of their visual field if the lesion is in their right hemisphere (which is the most common case) although some patients can still perceive a single stimulus presented on the left side. Only when a second stimulus is presented simultaneously further to the right, the patients claim to see only the one on the right while being ignorant of the left one. Awareness of the stimulus on the right seems to "extinguish" awareness of the one on the left (Driver and Vuilleumier 2001). GK, a 68-year-old man, was able to consciously detect single stimuli presented in his left visual field but failed to perceive them when a competing stimulus on the right was presented simultaneously. Nevertheless, Rees and colleagues found that "the same neural machinery was activated in early visual areas of the right hemisphere by a left visual field stimulus, whether seen or extinguished" (Rees et al. 2000, p. 1630). This suggests that mere activation of these areas, including primary visual cortex, is not sufficient for conscious experience. But they found another more specific result. There is a region located at the bottom of the temporal lobe, usually in the right hemisphere, called the "fusiform face area", which is robustly correlated with conscious experiences of faces (Kanwisher et al. 1997). When Rees et al. (2000) presented GK with a single face-stimulus in his left visual field he consciously perceived it in almost all cases, accompanied by a certain neural activity in the fusiform face area. But GK showed profound visual extinction when a second stimulus (which was never a face) on the right side was presented. Interestingly, although GK claims not to see the extinguished faces, the activation in his fusiform face area is almost as strong as when he consciously sees and reports seeing a face.

Block now offers alternative conclusions one could draw from this latter observation which are all consistent with the fact that GK does not report seeing a face despite the neural activation: (1) GK does in fact experience the face phenomenally but is not aware (access-conscious) of it. (2) In contrast to earlier assumptions, the fusiform face area is *not* the core neural basis for conscious experiences of faces. (3) Although the fusiform face area is the core neural basis, it is not its total neural basis and some part of the remaining total neural basis is malfunctioning. Based on his argument for overflow, Block endorses the first option. Since none of GK's negative subjective reports which are based on introspection can be used to decide the question whether his mental representation as of a face is totally unconscious or phenomenally conscious yet simply inaccessible, Block is willing to turn to neurophysiological criteria that may trump first-person criteria for phenomenal consciousness. He basically accepts Lamme's (2006) proposal that recurrent processing (either localized in visual cortex or widespread throughout cortex) is necessary and sufficient for phenomenology. Based on this move, Block predicts that "if the activations of the fusiform face area …in the patient GK turn out to be recurrent activations, we would have evidence for phenomenal experience that the subject not only does not know

about, but in these circumstances cannot know about" (2007, p. 498). Here, Block explicitly applies the third-person neurophysiological criterion of recurrent processing in order to decide whether in the case of GK phenomenology is present or absent. If one could measure recurrent processing in this case, then GK would be credited with phenomenology; if not, then GK's subjective report that he does not see a face would be vindicated. Even though there is obviously no additional sign that there is anything that it is like for GK to have a conscious experience as of a face, Block would credit GK with such a conscious experience, i.e. he would urge that GK has phenomenology without knowing it. In order to "know" about his own phenomenology, GK would need to have cognitive access to this face-representation, but he does not have this access, according to Block.

The main problem related to this move is not that, for example, option (2) is also available because at present it is not clear that the fusiform face area really *is* the neural basis of face experience (Kanwisher 2001). Nor is the main problem that it isn't established that recurrent processing is the neural machinery underlying phenomenology. It may well be the neural base of phenomenology. Rather, the problem is that this assessment of GK's situation seems to be at odds with Block's characterization of phenomenology, in particular with his endorsement of the same-order theory of phenomenal consciousness, as has already been pointed out in the beginning of this paper. Since Block does not elaborate this theory in more detail, one needs to rely on the sources he mentions in order to see what is meant by the claim that phenomenally conscious experiences partly consist in an awareness of themselves. What could this mean? According to Uriah Kriegel (2006, p. 150), one prominent recent defender of the same-order theory, "a conscious state arises, on this view, when a mental event … and the subject's awareness of it are integrated into a single unit through the relevant sort of cognitive process". So, according to this presentation of the view, phenomenology involves a cognitive process and results from some sort of integration. In his commentary to Block's article, Rosenthal (2007, p. 523) points out that on the same-order theory, the immediate awareness of a conscious experience "is every bit as cognitive as on the higher-order-thought hypothesis". The question then is whether the cognitive *process* amounts to cognitive *access* to the mental representation in question. According to Block, GK is supposed to provide an example of phenomenology without cognitive access. Obviously, GK does not have cognitive access to his mental representation of a face (if there is one). Thus, if according to the same-order theory, the cognitive process involved in the phenomenology of an experience implies that this representation is accessible, then there is an obvious conflict between Block's assessment of GK and the characterization of phenomenal consciousness in terms of the same-order theory. It seems that Block has to give up one of his claims. To be fair, it is far from clear that the secondary content posited by the same-order-theory implies cognitive access to a phenomenally conscious experience. But since, on this view, in having a phenomenally conscious experience, I am supposed to be conscious not only of the primary object of my experience (the face in front of me, say), but also of the act of experiencing the face, it seems strange to say that despite my being conscious of my experiencing the face in front of me, this does not provide me with access to this content of my experience. What else could it mean?

But maybe there is a way out for Block. Maybe there is another kind of access associated with phenomenology, which is different from cognitive access. This is

indeed what Block seems to have in mind. In his reply to commentators, Block distinguishes between two kinds of access and says that "GK has awareness-access on the left if he has phenomenology on the left, but it is his lack of broadcasting-access that explains why he cannot report what is on the left" (Block 2007, p. 536). What does awareness-access amount to? What does it provide the subject with regarding the experience? What can GK 'make' of his apparent phenomenal experience? In virtue of which effect may it justifiably called "access"? Despite this alleged form of awareness-access, GK is still going to deny having any experience at all. So having awareness-access does not seem to have any effect on his mental life at all. All that Block can mention in support of his claim is the neural activation of the fusiform face area and the possibility of recurrent processing, both of which are neurophysiological criteria. Although it is of course possible to distinguish different kinds of access and apply them to the present case, Block's move here seems to be ad hoc, since he posits a phenomenon, awareness-access, without providing any detailed characterization of it and without being able to present any obvious evidence for it to be present (be it in the case of GK or generally). Without further qualification (which he does not provide), it is not clear what awareness-access consists in and what effects it may have. In any case, Block needs to say much more about this second, weaker kind of access, which is not supposed to result in the subject being able to know that he or she has the experience in question. As long as this second kind of access is not elaborated in more detail, we seem to be confronted with two possibilities: Either GK has phenomenology as of a face and is cognitively aware of having this experience, then phenomenology comes with cognitive access. Or GK has no phenomenology as of a face and cannot cognitively access it. In neither case is phenomenology separated from cognitive access. So obviously, if one is to decide which claim Block should give up, it is his assessment of GK's situation and his endorsement of a third-person criterion for the absence or presence of phenomenology.

Conclusion

In this paper, it has been argued that Block's distinction between phenomenal consciousness and access consciousness is problematic. It has been shown that there is little motivation to regard access without any accompanying phenomenology as a separate kind of consciousness. Secondly, it has been argued that the experimental data mentioned in support of phenomenology without cognitive access allow for a different and more conservative interpretation, which does not drive a wedge between phenomenology and cognitive access. Thirdly, it has been shown that according to a characterization of phenomenology in terms of the same-order theory of consciousness, phenomenology seems to amount to cognitive access. Thus, for Block to endorse the same-order theory of consciousness *and* to argue for the presence of phenomenology in the absence of cognitive access, is highly problematic. In contrast to Block's conceptual distinction between two kinds of consciousness, it has been argued that we can make do with a more unified notion of consciousness that includes both a phenomenal and a functional dimension, but form only one kind, since these two aspects cannot be separated in the way suggested by Block. This proposal is

actually very close to how Block sometimes puts the distinction he has in mind. Phenomenology captures what consciousness *is*, cognitive accessibility captures what consciousness *does*. But on my view, we are talking about one and the same notion of consciousness here. It has further been suggested to characterize phenomenology independently from any kind of content. On this view, the difference between a phenomenally conscious representation and an unconscious representation is not a matter of the conscious representation having a further content. It is rather a matter of the presence or absence of a relational property, e.g. being integrated into a larger complex of representations underlying or making up the present total state of consciousness of a subject. Since the main purpose of the paper was to criticize Block's argument, this alternative has only been sketched in broad strokes.[19]

References

Armstrong, D. (1981). *The nature of mind and other essays*. Ithaca: Cornell University Press.

Baars, B. (1988). *A Cognitive Theory of Consciousness*. Cambridge.

Bayne, T., Chalmers, D.J. (2003). What is the unity of consciousness? In A. Cleeremans (Ed.), *The unity of consciousness* (pp. 23–58). Oxford: Oxford University Press.

Bayne, T. (2011). *The unity of consciousness*. Oxford: OUP.

Block, N. (1997). On a confusion about a function of consciousness. In N. Block et al. (Eds.), *The nature of consciousness. Philosophical debates* (pp. 375–415). Cambridge: MIT Press.

Block, N. (2002). Some concepts of consciousness. In D. J. Chalmers (Ed.), *Philosophy of mind: Classical and contemporary readings*. Oxford: Oxford University Press.

Block, N. (2007). Consciousness, accessibility, and the mesh between psychology and neuroscience. *Behavioral and Brain Sciences, 30*, 481–548.

Block, N. (2011). Perceptual consciousness overflows cognitive access. *Trends in cognitive sciences, 15*(12), 567–575.

Brentano, F. (1874/1973). *Psychology from an empirical standpoint*. London: Routledge.

Byrne, A. (2003). Don't PANIC: Tye's intentionalist theory of consciousness. In: *A Field Guide to the Philosophy of Mind* symposium on Tye's *Consciousness, Color, and Content* (winter 2002/3), URL = http://mit.edu/abyrne/www/tyesymp.pdf.

Byrne, A., Hilbert, D. R., & Siegel, S. (2007). Do we see more than we can access? *Behavioral and Brain Sciences, 30*, 501–502.

Carrasco, M., Ling, S., & Read, S. (2004). Attention alters appearance. *Nature Neuroscience, 7*(3), 308–313.

Carruthers, P. (2000). *Phenomenal consciousness*. Cambridge: Cambridge University Press.

Chun, M. M., Golomb, J. D., & Turk-Browne, N. B. (2011). A taxonomy of external and internal attention. *Annual Review of Psychology, 62*, 73–101.

Cohen, M. A., & Dennett, D. C. (2011). Consciousness cannot be separated from function. *Trends in Cognitive Sciences, 15*(8), 358–364.

Coltheart, M. (1980). Iconic memory and visible persistence. *Perception and Psychophysics, 27*(3), 183–228.

Corbetta, M., & Shulman, G. L. (2002). Control of goal-directed and stimulus-driven attention in the brain. *Nature Reviews Neuroscience, 3*, 201–215.

Crick, F., & Koch, C. (1990). Toward a neurobiological theory of consciousness. *Seminars in Neuroscience, 2*, 263–275.

de Gardelle, V., Sackur, J., & Kouider, S. (2009). Perceptual illusions in brief visual presentations. *Consciousness and Cognition, 18*, 569–577.

Damasio, A. (1999). *The feeling of what happens*. New York.

de Gelder, B., Tamietto, M., van Boxtel, G., Goebel, R., Sahraie, A., van den Stock, J., Stienen, B., Weiskrantz, L., & Pegna, A. (2008). Intact navigation skills after bilateral loss of striate cortex. *Current Biology, 18*, 1128–1129.

[19] But cf. Schlicht (2011) and Vosgerau et al. (2008).

Dehaene, S., & Naccache, L. (2001). Towards a cognitive neuroscience of consciousness: basic evidence and a workspace framework. *Cognition, 79*, 1–37.
Dehaene, S., Changeux, J.-P., Naccache, L., Sackur, J., & Sergent, C. (2006). Conscious, preconscious, and subliminal processing: a testable taxonomy. *Trends in Cognitive Sciences, 10*(5), 204–211.
Dennett, D. C. (1991). *Consciousness explained*. New York, Boston: Little.
Dennett, D. C. (1997). The path not taken. In N. Block et al. (Eds.), *The nature of consciousness. Philosophical debates* (pp. 417–419). Cambridge: MIT Press.
Dretske, F. (1995). N*aturalizing the Mind*. Cambridge: MIT Press.
Driver, J., & Vuilleumier, P. (2001). Perceptual awareness and its loss in unilateral neglect and extinction. *Cognition, 79*(1–2), 39–88.
Edelman, G. M., & Tononi, G. (2000). *Consciousness: How matter becomes imagination*. London: Penguin.
Grush, R. (2007). A plug for generic phenomenology. *Behavioral and Brain Sciences, 30*, 504–505.
Kanwisher, N. (2001). Neural events and perceptual awareness. *Cognition, 79*, 89–113.
Kanwisher, N., & Wojciulik, E. (2000). Visual attention: insights form brain-imaging. *Natur Reviews Neuroscience, 1*, 91–100.
Kanwisher, N., McDermott, J., & Chun, M. M. (1997). The fusiform face area: a module in human extrastriate cortex specialized for face perception. *Journal of Neuroscience, 17*(11), 4302–4311.
Kentridge, R. W., & Heywood, C. A. (2001). Attention and alerting: Cognitive processes spared in blindsight. In B. De Gelder, E. H. F. De Haan, & C. A. Heywood (Eds.), *Out of mind: Varieties of unconscious processes*. Oxford: Oxford University Press.
Koch, C. (2004). *The quest for consciousness: A neurobiological approach*. Englewood Cliffs: Roberts and Company.
Koch, C., & Tsuchiya, N. (2007). Phenomenology without conscious access is a form of consciousness without top-down attention. *Behavioral and Brain Sciences, 30*, 509–510.
Kouider, S., de Gardelle, V., & Dupoux, E. (2007). Partial awareness and the illusion of phenomenal consciousness. *Behavioral and Brain Sciences, 30*, 510–511.
Kriegel, U. (2005). Naturalizing subjective character. *Philosophy and Phenomenological Research, LXXI*, 23–57.
Kriegel, U. (2006). The same-order monitoring theory of consciousness. In U. Kriegel & K. Williford (Eds.), *Self-representational approaches to consciousness* (pp. 143–170). Cambridge: MIT Press.
Kriegel, U. (2009). *Subjective consciousness*. Oxford: Oxford University Press.
Kriegel, U. & Williford, K. (2006). Self-representational approaches to consciousness. Cambridge, Mass: MIT Press.
Lamme, V. (2006). Towards a true neural stance on consciousness. *Trends in Cognitive Sciences, 10*(11), 494–501.
Landman, R., Spekreijse, H., & Lamme, V. A. F. (2003). Large capacity storage of integrated objects before change blindness. *Vision Research, 43*, 149–164.
Lau, H., & Rosenthal, D. (2011). Empirical support for higher-order theories of conscious awareness. *Trends in Cognitive Sciences, 15*(8), 365–372.
Levine, J. (1983). Materialism and qualia: the explanatory gap. *Pacific Philosophical Quarterly, 64*, 354–361.
Libet, B. (2005). *Mind time. The temporal factor in consciousness*. London: Harvard University Press.
Lycan, W. G. (1996). *Consciousness and experience*. Cambridge: MIT Press.
Metzinger, T. (1995). Faster than thought. Holism, homogeneity and temporal coding. In T. Metzinger (Ed.), *Conscious experience*. Thorverton: Imprint Academic.
Mole, C. (forthcoming). Attention. In: J. Simons, & P. Calvo (eds.), *The Routledge Companion to the Philosophy of Psychology*. London: Routledge.
Naccache, L., & Dehaene, S. (2007). Reportability and illusions of phenomenality in the light of the global neuronal workspace model. *Behavioral and Brain Sciences, 30*, 518–519.
Nagel, T. (1974/1997). What is it like to be a bat? In: N. Block et al. (eds) *The nature of consciousness. Philosophical debates* (pp. 519–527). Cambridge, Mass.: MIT Press.
Overgaard, M. (2011). Visual experience and blindsight: a methodological review. *Experimental Brain Research, 209*, 473–479.
Papineau, D. (2007). Reuniting (scene) phenomenology with (scene) access. *Behavioral and Brain Sciences, 30*, 521.
Rees, G., Wojciulik, E., Clarke, K., Husain, M., Frith, C., & Driver, J. (2000). Unconscious activation of visual cortex in the damaged right hemisphere of a parietal patient with extinction. *Brain, 123*(8:1), 624–633.
Rees, G., et al. (2002). Neural correlates of consciousness in humans. *Nature Reviews Neuroscience, 3*, 261–270.

Rosen, A. C., Rao, S. M., Caffarra, P., Scaglioni, A., Bobholz, J. A., Woodley, S. J., Hammeke, T. A., Cunningham, J. M., Prieto, T. E., & Binder, J. R. (1999). Neural basis of endogenous and exogenous spatial orienting: a functional MRI study. *Journal of cognitive Neuroscience, 11*, 135–148.

Rosenthal, D. M. (2004). *Consciousness and mind*. Oxford: Oxford University Press.

Rosenthal, D. (2007). Phenomenological overflow and cognitive access. *Behavioral and Brain Sciences, 30*, 522–523.

Schlicht, T. (2011). Nonconceptual content and the subjectivity of consciousness. *International Journal of Philosophical Studies, 19*(3), 489–518.

Sergent, C., & Rees, G. (2007). Conscious access overflows overt report. *Behavioral and Brain Sciences, 30*, 523–524.

Sosa, E. (2002). Privileged access. In Q. Smith & A. Jokic (Eds.), *Consciousness: New philosophical perspectives* (pp. 273–94). Oxford: Oxford University Press.

Sperling, G. (1960). The information available in brief visual presentations. In B. Baars et al. (Eds.), *Essential sources in the scientific study of consciousness* (pp. 325–356). Cambridge: MIT Press 2003.

Tononi, G. (2004). An information integration theory of consciousness. *BMC Neuroscience, 5*, 42.

Treue, S. (2001). Neural correlates of attention in primate visual cortex. *Trends in cognitive sciences, 24*(5), 295–300.

Tye, M. (1995). *Ten problems of consciousness*. Cambridge: MIT Press.

Tye, M. (2007). Phenomenal consciousness and cognitive accessibility. *Behavioral and Brain Sciences, 30*, 527–528.

Tye, M. (2009). *Consciousness revisited. Materialism without phenomenal concepts*. Cambridge: MIT Press.

Van Gulick (2004a). Higher-order global states. In: R. Gennaro (ed), *Higher-order Theories of Consciousness*. Amsterdam and Philadelphia: John Benjamins Publishing.

Van Gulick, R. (2004b). Consciousness. In: *The Stanford Encyclopedia of Philosophy* (Winter 2004 Ed.). Ed. by Edward N. Zalta, URL=http://plato.stanford.edu/entries/consciousness/.

Vosgerau, G., Schlicht, T., & Newen, A. (2008). Orthogonality of phenomenality and content. *American Philosophical Quarterly, 45*, 329–348.

Weiskrantz, L. (1986). *Blindsight. A case study and its implications*. Oxford: Oxford University Press.