

THE LIMITS OF CONSCIOUSNESS: A CRITIQUE OF NED BLOCK'S "OVERFLOW" ARGUMENT

Ned Block has claimed that phenomenal consciousness and cognitive access can come apart, such that one can have a phenomenal experience of something without having the kind of access to this experience that would allow one to report on it. He bases his argument to a large extent on an interpretation of Sperling's study of iconic memory. I highlight two claims that Block makes concerning this study, and argue that both claims are problematic and insufficiently supported by the empirical evidence.

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In "Consciousness, accessibility, and the mesh between Psychology and neuroscience" (2007)¹, Ned Block argues that "phenomenal consciousness overflows cognitive accessibility" (481).² In philosophy of mind, "phenomenal consciousness" is often defined as there being *something that it is like* for a subject to have the experience. With "cognitive access," Block refers to the kind of access we can have to mental states that makes them reportable by us. His claim is that we can have certain experiences that are phenomenally conscious – there is something that it is like for us to have such an experience – without us having cognitive access to these experiences such that we can report on them. Block bases his claim on a particular interpretation of several experiments within the field of neuroscience. One of the most important studies in support of his claim is the Sperling experiment (Sperling 1960). In this study, subjects are shown a frame of several rows of letters and then have to report which letters they have seen. According to Block, the subjects in Sperling's study

have a phenomenal experience of more letters than are cognitively accessible to them. Thus, Block concludes, we can have a phenomenal experience of something without having cognitive access to it.

Block's claim is controversial and has led to much discussion on the topic of "phenomenal overflow".³ In this paper, I argue that Block's claim is not sufficiently supported by the empirical evidence he provides. In order to show that Sperling (1960) does not establish Block's claims, I first discuss a methodological puzzle that seems to hinder any kind of research in the field of phenomenal consciousness and cognitive access. Secondly, I explain the setup and results of Sperling's experiment and the conclusions Block draws from them. Thirdly, I present two claims that Block wants us to go along with: (1) that the subjects in Sperling's study have visual representations of all of the letters that are specific enough to explain the results of the study; and (2) that those visual representations are phenomenal. I argue that Block does not succeed in establishing

the truth of either of these claims. My aim in this article is not to show that Block's main claim – that phenomenal consciousness overflows cognitive accessibility – is wrong. It could very well be that Block is right in this. Rather, my aim is to show that Block's conclusion is not supported by the evidence he provides.

I. Methodological puzzle

Why should we be discussing the relation between phenomenal consciousness and cognitive accessibility at all? Generally, when we wish to test whether someone is phenomenally aware of something, we use their report as evidence. But it is of practical and moral importance to be able to establish such awareness even when the person isn't able to report on anything at all. Think, for example, of a person in a vegetative state. We want to be able to establish whether such patients are phenomenally conscious or not. However, since there are no reports to rely on in these cases, we need different ways of establishing the presence of phenomenal awareness.

In order to find alternative ways of establishing phenomenal consciousness, it is useful to locate the brain processes that underlie reportability and research how they are connected to the processes that enable phenomenal awareness.

Thus, we would like to find out “whether the cognitive access underlying reportability is a constitutive condition of phenomenal consciousness,” which is Block's aim in his article (482). However, there is a difficulty with researching these mechanisms, which Block refers to as the “methodological puzzle” (481). In general, if one wants to know whether a certain neural process x is a constitutive condition for a type of phenomenal experience y , one can try to determine “the core neural basis of the experience” (482).⁴ The core neural basis (CNB) is part of the total neural basis that is sufficient for phenomenal experience y . The CNB is that which distinguishes state y from state z . An example: If I want to determine the CNB of the phenomenal experience of red, I can do this by showing subjects red samples in a controlled environment while measuring their brain processes. I will also show them samples

of several other colors (each so that they only see that one color). The parts of their brain that “light up” when the person has the experience of red form the total neural basis of the state, while the parts that only “light up” in the red experience but not in any of the other color experiences are its CNB.⁵ The way to establish that the experience is phenomenally conscious is by asking the subject what they see and relying on their report.

However, when trying to find out whether we can have phenomenal awareness without the cognitive access underlying reportability, we run into trouble. We need to determine the CNB of a type of phenomenal experience, y , with cognitive access to y , and then we need to check if the same areas are active in test situations where there is phenomenal consciousness but where there is *no* cognitive access as measured by reportability. The problem here is determining whether there is phenomenal consciousness in the latter case. If the same brain areas are active when there *is* no reportability, this does not necessarily mean

that there *is* phenomenal awareness. That which made the state unreportable might also have made it unconscious, and the areas that “light up” might be involved in un-

conscious/background processes. In most test situations, the way to find out if someone has a phenomenal experience of type y is to ask them. But that option is not available to us, since we want to test for the occurrence of phenomenal consciousness *without* cognitive access. Thus, it seems there is no way to empirically establish whether the mechanisms of cognitive access that underlie reportability are a constitutive condition of phenomenal consciousness.

While Block acknowledges that there is a challenge here, he refuses the pessimistic conclusion, and thinks that the right kind of experiments allow us to empirically establish whether phenomenal consciousness overflows accessibility. Just like in other branches of empirical sciences where we build models based on measurement and use those to determine measurement errors, we can also use empirical evidence to research consciousness and draw conclusions about accessibility. So what kind of experiments does Block use to draw these kinds of conclusions?

Block's claim is that we can have certain experiences that are phenomenally conscious without us having cognitive access to these experiences such that we can report on them.

II. Sperling's study

One of the studies that play a central role in Block's argument is a study by George Sperling (1960) that focuses on the lingering images of a visual impression.⁶ In the first experimental setup, the subjects were first shown three rows of four letters for 50 milliseconds immediately followed by a blank screen. In this *full report* situation, the subjects then had to report all the letters they had seen. Subjects were usually able to report between 3 and 4 letters. Sperling then did the experiment with a similar setup, but where there occurred a sound cue after the screen with the letters had been replaced with a blank screen. The subjects were instructed to report the letters they remembered from the top row in case of a high tone, the middle row

in case of a middle tone, and the bottom row in case of a low tone. In this *partial report* situation, subjects only had to report the row that was cued. The outcome was that the subjects could report almost all the letters from the row that was cued. So if they were shown the three rows, and received a low tone cue after the rows had been replaced by the blank screen, they were usually able to report 3 to 4 letters of the bottom row. It is quite remarkable that the subjects only remembered 3 or 4 out of 12 letters in the full report situation, but were nonetheless able to reproduce *any* row (almost) completely when given a sound cue *afterwards*. Block concludes from this that the subjects phenomenally see more items than they can cognitively access, and that the "phenomenology persists beyond the stimulus" (487). Thus, phenomenal awareness overflows cognitive accessibility, according to Block.

III. Specific/generic visual representations

The picture that Block presents us with is that subjects are phenomenally aware of *all* (or almost all) the letters, but because of the limited capacity of working memory, they can only report about four. Subjects are unable to bring all of the letters under a specific concept or representation (487). Thus, they cannot cognitively access all the letters that they are phenomenally aware of, which supports Block's conclusion that phenomenal awareness overflows

cognitive accessibility. But do we need to invoke the idea that the subjects were phenomenally aware of all the letters in order to explain the experiment? To be clear: The subjects were usually able to recall any row of letters when cued, which is remarkable and indeed calls for an explanation.

But do we need to explain it the way that Block does, by positing distinct systems for phenomenal consciousness and cognitive accessibility?

An alternative explanation of the results of Sperling's experiment, presented by Kouider et al. (2007), is that we can have different levels of representations depending on whether we have partial or full awareness of the object(s) we perceive. In the Sperling case, the subjects have partial awareness, but because of context and expectations they can make inferences about

higher-level representations (Kouider et al. 2007:511). Block claims that this is just a different version of his view, and that the only thing they disagree on is how degraded the phenomenal richness is (532). He appeals to the distinction between generic and specific phenomenal awareness: "For the Sperling experiment, the relevant generic/specific difference would be that between a phenomenal presentation *that there is* an array of alphanumeric characters and a phenomenal presentation of specific shapes of all or most items in the array" (531). Block interprets the view of Kouider et al. as "partial specific phenomenology" rather than generic, which makes it quite similar to his own view (532). He also argues that his critics have to agree on the fact that, before the cue, the subjects have "*specific* (not just generic) visual representations" of (almost) all of the letters (531). This, according to him, is the only way to explain the results of the experiment. The discussion is only about "whether those specific representations are phenomenal," which they are according to Block (531). Thus, Block presents us with two claims concerning the Sperling study that are central to his interpretation of the study: (1) that the subjects have specific visual representations before the cue; and (2) that those representations are phenomenal. While Block thinks that the only real debate concerns (2), I argue that neither of the claims is sufficiently supported by his interpretation of Sperling.

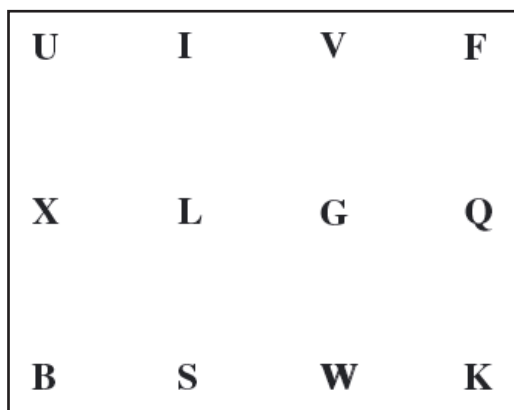
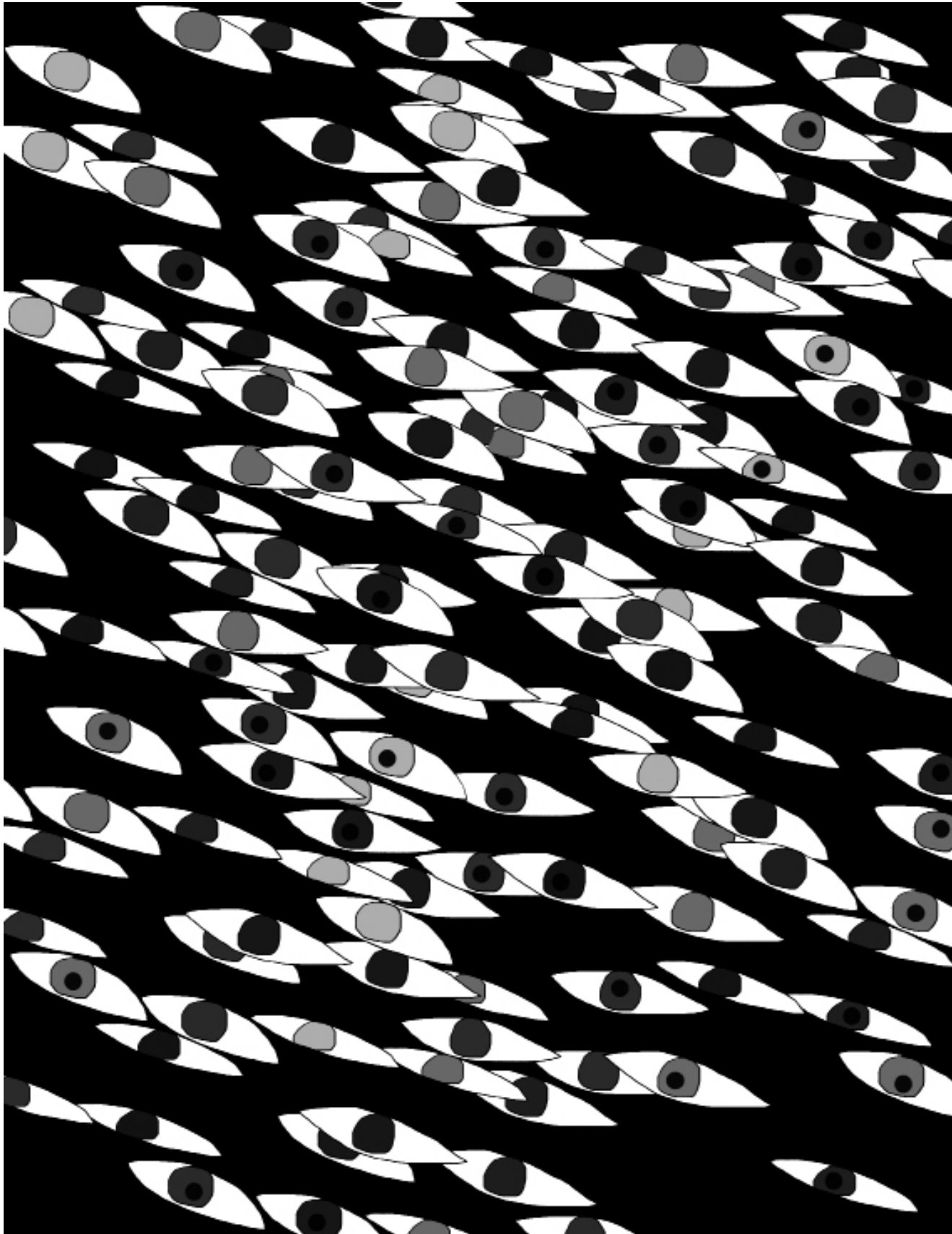


Figure 1: Typical stimulus in Sperling (1960) experiment. Source: Phillips (2011).



Illustrasjon: Camilla Elise Berg

IV. Cue-sensitivity and subjects' reports

According to Block, even his critics have to acknowledge the truth of the first claim – that the subjects have *specific* visual representation before the cue is introduced. But do we actually need to go along with this claim in order to explain Sperling's findings? One way to avoid this conclusion is presented by Ian Phillips (2011), who argues that Block cannot base his overflow argument on the Sperling experiment. In order to give a different reading of the experiment, Phillips discusses the phenomenon of post-dictive perception, that is, of stimuli after the fact having an effect on the original perception. This is a well-known phenomenon in perceptual studies that can be explained by the way in which different kinds of information are integrated into our conscious experience.⁷ In order to integrate all the stimuli (audial, visual, etc.) into a coherent experience, there is a slight delay in our experience of the world. As Michael Tye explains it: “[O]ur brains collect information a little into the future before an experience is generated, so that what we experience as the present is in reality a little in the past” (Tye, cited in Phillips 2011:393). This raises a problem for interpretations of experiments, such as Sperling's, that rely on cuing. This is because the cue can actually affect the original perception. Thus, on Phillips' view, “[t]he answer to the question, ‘What was seen at *t*’, where *t* is the time where the display is presented to subjects, is not answerable independently of what is presented over the surrounding periods” (Phillips 2011:400). This would mean that, instead of showing that we have specific phenomenal representations of the letters involved, the Sperling experiment might show that our perception is manipulated by cuing. Phillips indicates that we still do not have a complete scientific understanding of post-dictive perception; hence he does not want to make any strong claims. His aim is to establish that Sperling's experiment does not necessarily show phenomenal overflow, and his argument suffices to undermine Block's claim that we should all agree to the subjects in the experiment having *specific* visual representations of all (or almost all) of the letters.

However, let us return for a moment to the discussion that Block wants to have concerning the second claim – that is, given the assumption that there was *specific* representation before the cue, whether this representation was phenomenal or not. The main reason Block gives for

assuming phenomenal awareness in the Sperling experiment is that the subjects *reported* such awareness: “Subjects said that they could see all or almost all of the characters” (487). There are two important problems with relying on subjects' reports. Firstly, there is ample empirical support showing that subjects' reports are not sufficiently reliable. For example, McConkie and Rayner (1975) conducted an experiment where subjects read a text on a screen, where only the part that their gaze falls on (registered by eye-tracker sensors) appears to them as real text, while the rest is blurred out. The subjects claim to be able to see the whole text, but there is no such thing as the “whole text”

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at any given time (Kouider et al. 2007). Kouider & Dupoux extended this phenomenon to putting in false words that are recognized as real words (Kouider & Dupoux, cited in Kouider et al. 2007:511). Kouider et al. (2007) also predict that, in the Sperling study, the subjects would claim to experience “all the letters” even if there would be false letters in the uncued rows. This means that, even though the subjects might claim to be phenomenally aware of all the letters, they cannot recognize things that aren't letters amongst them.

Surprisingly, Block finds this suggestion – that subjects will not be able to recognize false letters in a Sperling-like experiment – a plausible assumption (532). However, if we have phenomenal awareness that it is of such a degraded level that we cannot even recognize false letters (when we report having awareness of the letters), then it cannot do the explanatory work that Block wants it to do, which is to explain how it is that subjects are remarkably good at remembering letters from cued rows. Moreover, concerning the specificity of the visual representations, Block states: “According to the overflow argument, all or almost all of the 12 items are consciously represented, perhaps fragmentarily but *well enough to distinguish among the 26 letters of the alphabet*” (2011:1; emphasis mine). It seems unlikely that subjects would have phenomenal experiences of the letters that are specific enough to distinguish between the letters of the alphabet, but not being able to pick out false letters.

Secondly, and more importantly, Block's reliance on subjects' reports leads us back to the methodological puzzle outlined earlier. Block's aim is to see whether cognitive access is constitutive of phenomenal awareness, and he claims that they come apart into two different systems, so that we can have phenomenal experiences without re-

portability. However, it seems that he needs the subject's reports in order to establish this phenomenal awareness overflow. Byrne, Hilbert & Siegel (2007) point out that in Sperling-like experiments, the subjects' reports simply are not detailed enough to support Block's arguments.⁸ They claim that in order to establish that subjects have specific phenomenal awareness before the cue, their report would have to include the characteristics of each item such that it is distinguished from the other items. However, this is just a different way of saying that subjects have to have cognitive access to the experience of each item in such a way that they can report on them. Thus, if we demand this kind of report, we are testing phenomenal awareness with cognitive accessibility. Block's interpretation of Sperling is unsupported, therefore, because the evidence he needs to claim specific phenomenal awareness before the cue is exactly the kind of evidence that undermines his strategy for getting around the methodological puzzle.

V. Conclusion

Block's aim is to find out whether cognitive accessibility is constitutive of phenomenal consciousness. In order to show that these systems can come apart, he gives an interpretation of Sperling's study that claims (1) that the subjects in the experiment have specific visual representations of all (or almost all) of the letters before the cue is given; and (2) that those representations are phenomenal. According to Block, these specific phenomenal representations explain why the subjects in the study are remarkably good at remembering the cued rows. If this interpretation were correct, it would provide evidence for a case of phenomenal consciousness without cognitive access. However, the first claim is undermined by the possibility of cue-sensitivity influencing the results of the experiment. And Block's arguments for the second claim rely heavily on the subject's reports of what they experienced in the experiment. These reports are not reliable enough to establish phenomenal representations before the cue. Moreover, instead of avoiding the methodological puzzle, the use of subjects' reports leads us back to this puzzle. Thus, even if there is such a thing as an overflow of phenomenal consciousness, Sperling's experiment does not provide evidence for it.

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NOTES:

- ¹ Since almost all references to Block refer to his 2007 article, I will henceforth refer to it by page number only.
- ² Block usually avoids the term "phenomenal consciousness" and mostly writes "phenomenology" instead (Block 2011:485). However, in the context of this article, I think it is unnecessary to make this move. I mostly use the more common term "phenomenal consciousness" (aside from places where I quote Block). In some places, I also write "phenomenal awareness" or "phenomenal experience," and I use these phrases interchangeably with "phenomenal consciousness".
- ³ See Block's (2007) target article with reactions from many philosophers and scientists working on consciousness and perception, as well as Block's (2011) article where he reacts to the controversy around the original article.
- ⁴ Block rejects the commonly used term Neural Correlate of Consciousness (NCC), because he considers correlation to be too weak a relation.
- ⁵ This description of the experimental setup is an oversimplification for illustrative purposes.
- ⁶ I will restrict my discussion to this experiment, but a large part of the discussion applies to other experiments Block uses (such as Landman et al. 2003) in a similar way.
- ⁷ Phillips mentions a wide range of studies that provide evidence for postdictive perception (see Phillips 2011: §3).
- ⁸ Byrne et al. (2007) talk about the experiment by Landman et al. (2003), but the same applies to Sperling (1960).