

Commentary on Block, "Consciousness, accessibility, and the mesh between psychology and neuroscience", *Behavioral and Brain Sciences* (2007)

Do we see more than we can access?

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Abstract: One of Block's conclusions, motivated by partial-report superiority experiments, is that there is phenomenally conscious information that is not cognitively accessible. We argue that this conclusion is not supported by the data.

Block's overall argument appeals to the lemma that "in a certain sense phenomenal consciousness overflows cognitive accessibility" (p. 1), which Block takes to be supported by Landman et al. (2003) and Sligte et al. (2006). (For reasons of space we will ignore the latter.) Block summarizes his discussion of these two papers as follows:

The main upshot of the Landman and Sligte experiments (at least on the surface –

debunking explanations will be considered later) is along the same lines as that of the Sperling experiment: the subject has persisting experiences as of more specific shapes than can be brought under the concepts required to report or compare those specific shapes with others. (p. 18)

Thus, in the first condition of the Landman et al. experiment, Block holds that the subjects have persisting experiences as of [a circle of] eight rectangles, with the horizontal/vertical orientation of each rectangle specified. And if that is so then, as Block says, the subject's experiences are not completely accessible, because the subjects can report the orientation of only four (or so) rectangles.

Although most of Block's discussion is couched in terms of "phenomenal consciousness" and the like, for present purposes we can talk instead (as Block himself sometimes does) of what the subjects see. Put this way, Block's claim is that the subjects continue to see each rectangle as oriented horizontally or vertically after the stimulus has been replaced with a gray screen. In the terminology of Coltheart (1980), this is an example of *visible persistence*.

Coltheart distinguishes *visible persistence* from *informational persistence*. The latter is defined not in terms of seeing, or phenomenal consciousness, but in terms of the persistence of rich visual information about a stimulus after it has been replaced. Sperling-type experiments show that stimulus information is held in a high-capacity but transient memory, and thus that there is informational persistence. One might hold that there is informational persistence simply because there is visible persistence; that is, stimulus information continues to be available because the subject continues to see the stimulus. Coltheart argues, however, that the phenomena are not connected so intimately.

One consideration is that informational persistence lasts longer than a few hundred ms, the duration of visible persistence. (As Block notes, the duration of informational persistence found by Landman et al. is about 1,500 ms.¹)

With this distinction in hand, consider Landman et al.'s conclusion:

The present data agree with the presence of two parallel types of short term memory.... Almost all items enter the first type of memory. It is like iconic memory, because it has a high capacity and it is maskable.... The second type of memory is one that resists interference by new stimuli. When new items enter the visual system, they replace the old items, except the ones that have entered the second type of representation.... The cue-advantage arises because the subjects selectively transfer the cued item from iconic memory to the more durable working memory... (Landman et al. 2003, p.162)

Landman et al. are, then, concerned with informational persistence, not visible persistence. Their paper contains no data concerning visible persistence. Since informational persistence is consistent with no visible persistence at all, Block's appeal to Landman et al. must be somewhat indirect.

And indeed it is. Block's argument for visible persistence is based on subjects' reports: "[subjects say they are] continuing to maintain a visual representation of the whole array" (p. 17).

We have three points about this. First, Block needs only the weaker claim that the subjects in the Landman experiment saw each rectangle as oriented horizontally/vertically, not the stronger claim that the subjects *remain* in this state after the stimulus has been replaced. The weaker claim implies Block's conclusion about

inaccessibility for the same reason that the stronger one does.

We do not dispute that information about the orientation of each rectangle persists and is not as a whole accessible; we do dispute Block's claim that this inaccessible information characterizes what the subjects see. Our second point is, it is unclear that subjects' reports unequivocally support Block. Block needs subjects to agree that they saw *each* rectangle as oriented horizontally/vertically (even if they can't report which orientation each rectangle has). More precisely: for each rectangle x , either they saw x as horizontal, or they saw x as vertical. If the subjects merely say that they saw eight rectangles, some horizontal and some vertical, or that "they can see all or almost all the 8–12 items in the presented arrays" (p. 18), this is insufficient.

According to Landman et al., selected stimulus information is transferred from the transient iconic memory to the more durable working memory. Working memory therefore contains less information about the stimulus than iconic memory. If that is all working memory contains, and if working memory governs subjects' reports about what they see (as Block supposes), then subjects should simply say that they saw a circle of rectangles and saw some of them as oriented horizontally/vertically. They should not, then, agree they saw details, some of which they can't report. So our third point is this: Block must deny that the contents of working memory are simply a subset of the contents of iconic memory, which is to go beyond the results of Landman et al. If Block is right and subjects report (correctly) that they saw each rectangle as oriented horizontally/vertically, then the contents of working memory should include, not just certain information about the stimulus transferred from iconic memory, but also the metainformation that some information was *not* transferred. We are not saying this

proposal about the contents of working memory is wrong, but only that the Landman experiment does not address it.

Notes

1. The question of the exact relationship between visible and informational persistence remains open. Loftus and Irwin (1998) argue that the many measures of visible and informational persistence pick out the same underlying process. Nevertheless, the distinction is still useful and our discussion does not rely on the assumption that it marks a real difference.

References [Alex Byrne, David R. Hilbert, and Susanna Siegel][AB]

Coltheart, M. (1980) Iconic memory and visible persistence. *Perception & Psychophysics* 27: 183–228. [AB]

Landman, R., Spekreijse, H. & Lamme, V. A. F. (2003) Large capacity storage of integrated objects before change blindness. *Vision Research* 43: 149–164. [AB]

Loftus, G. & Irwin, D. (1998) On the relations among different measures of visible and informational persistence. *Cognitive Psychology* 35: 135–199. [AB]

Sligte, I. G., Lamme, V. A. F. & Scholte, H. S. (2006) Capacity limits to awareness. Paper presented at the Association for the Scientific Study of Consciousness, Oxford. [AB]