

Is the grain of vision finer than the grain of attention? Response to Block.

Henry Taylor

Penultimate version, please cite published version.<sup>1</sup>

*Abstract*

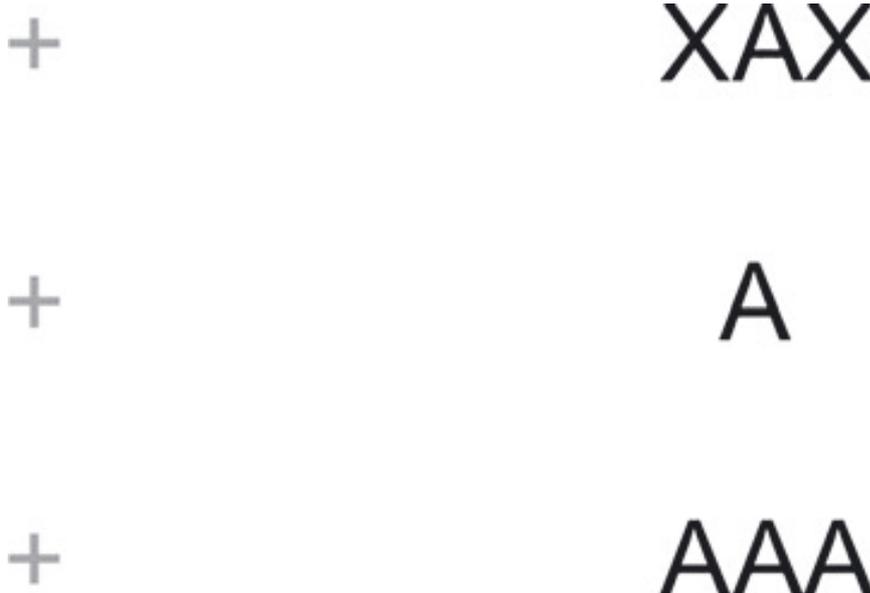
In many theories in contemporary philosophy of mind, attention is constitutively linked to phenomenal consciousness (e.g. Prinz, 2012). Ned Block (2013) has recently argued that ‘identity crowding’ provides an example of subjects consciously seeing something to which they are *unable* to attend. Here I examine the reasons that Block gives for thinking that this is a case of a consciously perceived item that we are unable to attend to, and I offer a different interpretation.

*§1-Attention and Crowding.*

Block argues that in (at least some) cases of ‘perceptual crowding’, we have good reason to think that we can consciously perceive an item, even though we are unable to direct our attention toward the item in question. Block marshals several considerations to make this case (which will be examined below) but his main argument comes from the following example of a kind of perceptual crowding that he calls ‘identity crowding’ (2013, pp.173-176):

---

<sup>1</sup> This is the peer reviewed version of the following article: Is the grain of vision finer than the grain of attention? Response to Block. *Thought*. 2 (1): 20-28, which has been published in final form at 10.1002/tht.59. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving.



**Figure 1: An example of 'identity crowding'. Fixate your gaze on each cross in turn and attempt to identify the letter(s) to the right of it. From Block (2013, p.174): John Wiley and Sons, Inc. Reproduced with permission.**

Fixate your gaze on the top cross in fig.1. You will find that you are unable to direct your attention toward the middle letter in the set of letters (the 'XAX') on the right of the top cross. It does, however, seem that when we focus our gaze upon the cross in the *middle* row, we can focus our attention upon the 'A' to the right of that cross. The crucial case for Block's argument comes from the bottom row. When we focus our gaze upon the cross at the bottom, we are unable to direct our attention towards the *middle* 'A' in the collection of A's on the right of that cross. It does seem plausible, however, that we can direct our attention toward at least one of the other two 'A's on the bottom row (the 'flankers'). Nonetheless, we are capable of realising *that* there is a third item in addition to the flankers on the bottom row, and we are also capable of identifying the middle item in the bottom row as an 'A'. Block claims that the middle 'A' of the bottom row is consciously seen, but we are unable to direct our attention to it. Block summarises this conclusion by saying that the 'grain' of vision is finer than the 'grain' of attention (2013, p.176).

Block claims that ‘there can be conscious perception of an object without attention to that object’ (2013, p.170), though he does accept that ‘there may still be diffuse spatial attention to the area’ (2013, p.173). Thus, Block’s claim is not that consciousness is possible in the *entire absence* of attention, but rather that there can be representations of some object in phenomenal consciousness in the absence of attention *to that particular object*.

*§2-An analysis of Block’s argument.*

I accept that the middle ‘A’ on the bottom row of figure 1 does not have object attention directed upon it. I also accept that it is seen. What I dispute is Block’s main claim, that it is seen *consciously*.

I interpret Block’s claim in the following way:

Core Claim (CC): In fig.1, when we are focussing our gaze upon the plus at the bottom of the diagram, we can have a phenomenally conscious representation of the middle ‘A’ in the bottom row, even though we cannot direct our attention towards that ‘A’.

CC contrasts with the claim that really we do not have a phenomenally conscious representation of the middle ‘A’ in the bottom row, but instead we have a representation of a ‘texture’ or ‘indeterminate shape’. If this alternative interpretation were true, then the fact that subjects cannot attend to the middle ‘A’ of the bottom row should not concern us, because the middle ‘A’ is not represented in consciousness. We can call this alternative explanation the ‘texture interpretation’ and it is this that Block is keen to deny (2013, pp.171-172).

The central argument that Block gives for accepting that subjects had a phenomenal representation of the middle ‘A’ (and thus that CC is correct) is that subjects had access to various pieces of information about the middle ‘A’. As Block says:

‘Since identity-crowding allows detection (i.e. distinguishing between presence and absence), differentiation from the background, discrimination from other items and visual identification of the items-all consciously-it is difficult to see a rationale for denying that one can consciously see them’ (2013, p.175).

In order to deny Block’s claim that the middle ‘A’ is consciously seen, we will need an explanation of how the subjects may have access to this information about the middle ‘A’ without committing us to the claim that this middle ‘A’ is represented consciously. I shall give such an explanation, then I shall defend it from some of Block’s other claims in support of CC.

Let us start with the claim that though we may not be able to direct our attention to the middle ‘A’ as such, we are still able to direct our attention toward the *group of items as a whole*. When we direct attention towards the group itself, we will come to have some kind of phenomenal representation of the group of items to the right of the cross. It may be that this phenomenal representation is determinate and detailed enough to represent (at least one of) the *flankers* specifically as an ‘A’. However, the texture may be too indeterminate to represent the middle letter specifically as an ‘A’. This would fit neatly with the texture interpretation and be an alternative to CC.

But if the representation of the group lacks the detail to represent the middle ‘A’ specifically, then how can we explain Block’s main point, which is subjects’ abilities to discriminate and identify the middle item as an ‘A’? I claim that when we focus our gaze at the bottom cross, and move our attention toward the bottom group of letters, we may have a phenomenal representation, which is too indeterminate to represent the middle ‘A’ but which may represent at least one of the *flanking* letters specifically as an ‘A’ (this will not worry those who disagree with CC, because it seems plausible that at least one of the flankers can be subject to attention). Then the experience of the group may make the subjects able to judge that the group is cluttered (that is, that it contains more than just the flankers). This would allow us to conclude that there was something there in addition to the two flanking letters. We could then notice that the overall representation of the items has a

certain congruity, or uniformity. From these pieces of information, we will be able to infer that there is another item in addition to the flankers, and that the middle item is the same as the flankers, i.e. that it is an 'A'. What this response keys into is that the subjects may represent abstract properties of the group of items in their phenomenal consciousness, and that subjects may be using this information to make the judgements that they do, they need not represent the middle 'A' individually.

So the claim is that subjects can infer from:

(1) (At least one of) the flanking letters is an 'A' (the representation of the group of letters may be specific enough to allow for this identification).

And:

(2) The experience represents the group as 'cluttered' (indicating that there are more items there than just the flankers).

And:

(3) The overall representation of the group of items shows congruity and uniformity (indicating that the middle item is probably the same as the flankers).

To the claim that:

(4) There is a middle item which is probably also an 'A'.

What is crucial for this interpretation is that nowhere do we need to claim that there is a specific phenomenal representation of the middle 'A', and yet we are able to explain subjects' capacities to report that there is a middle letter, and to identify it. So Block's claim, that subjects' abilities when confronted with the task shows that subjects had a phenomenal representation of the middle 'A', will not hold up, and CC will not have been established. All we need to claim is present in consciousness is a representation of the group which is detailed enough to identify at least one of the flankers, and also appears cluttered and congruous. This will explain subjects' abilities.

I do not think that this appeal to things such as ‘congruity’ should strike us as odd. We have good independent reason to think that the visual system is capable of detecting whether a collection of items is ‘congruous’ with each other or not, and for spotting anomalous items. We know this from the phenomenon of ‘visual pop-out’ (see e.g. Wolfe and Horowitz, 2004) where certain items which are significantly different from other items that they are placed among (such as a slanted line in a collection of straight lines) will ‘pop-out’ at us, and they will attract our attention. The reason that they pop-out is because the visual system can discriminate that they do not belong with the other items, they are anomalous or incongruous. All of this would seem to indicate *at the very least* that the visual system is capable of judging whether a collection of items is ‘congruous’ or ‘uniform’ and thus this alternative interpretation of the data should be considered.

The plausibility of my claim should be tested using introspection. Focus upon the bottom cross and attend to the collection of three ‘A’s. Now do the same but with the top set (the ‘XAX’) group. It strikes me as plausible that when we reflect upon the phenomenology of these contrasting experiences, the top one will strike us as ‘more messy’ and more incongruous than the bottom one, even though it is difficult to say exactly why. Equally, the bottom group of ‘A’s is likely to strike us as ‘more cluttered’ than the middle row, where there is only one ‘A’.

Notice that this account is compatible with some other abilities that subjects have in relation to the middle ‘A’ of the bottom row. For example, Block notes that subjects can have *de re* thoughts about it (they can ask of it ‘what is that?’). This Block takes as further evidence that the middle ‘A’ was represented in phenomenal consciousness (Block, 2013, p.177. See also Dretske, 2007, Siegel, 2006 and Tye, 2009a, p.59 and 2009b). The interpretation just given can accommodate this. It could be that the group of letters is represented as cluttered, and that we can use this information to reach the conclusion that there is another item there in addition to the flankers, and *this* would allow us to wonder ‘what is that?’ about this extra item, and thus it could be the basis of *de re* thought. Nowhere need we claim that the middle ‘A’ is actually represented in phenomenal consciousness.

*§3-Objections and replies.*

In this section I shall discuss some other considerations that Block brings forth in favour of CC.

*§3.1-Objection 1.*

Block discusses and rejects the idea that subjects may be using inference to identify the middle 'A'. He references an experiment where subjects had triplets of Gabor patches (grids) each of which were slanted in a specific orientation presented in the periphery of their visual field, and then were asked to identify which triplet they had just been exposed to. Block notes that performance was different when they had been exposed to the triplet of patches slanted to the orientation '///' as opposed to the triplet '∧∨' (see Petrov and Popple, 2007, pp.3-5). He concludes that:

'[t]he... experiment suggests that subjects' success in identity crowding is genuinely perceptual and not just a cognitive inference from the look of uniformity and identification of the flankers. For there are considerable asymmetries between left and right tilts that only can be explained perceptually' (2013, p.175).

In response to this, I should stress that my claim is not that subjects *just* used information about the identity and uniformity of the *flankers* to make their judgement, but that they used this information about the flankers *together with the overall look of clutter, congruity and uniformity of the experience of the group itself*. This experience would afford them information that would not have been given simply by identifying the flankers and then drawing an inference from that. So Block's claim that subjects were not *only* using the identity of the flankers to draw their conclusions does not serve to rebut this interpretation.

A point that is made by Tye (2010, p.416) is worth reemphasising now, which is that something can *contribute* to the phenomenology of an experience, without actually being *represented* in the experience. This is plausibly the case with middle '/' in the Petrov and Popple

experiment and the middle 'A' in the bottom row of figure 1. These items may contribute to the phenomenology of the experience of the group (by making the group appear more congruous/incongruous or more cluttered/uncluttered). Indeed, it is plausible that the contribution made by these items is different from the contribution that other items would have made if they had been present. Nonetheless, it does not follow that these items are themselves represented in consciousness.

In the above quotation, Block claims that the 'asymmetries' in discriminatory abilities between identifying a '///' and identifying a '/\/' in the Petrov and Popple experiments 'can only be explained perceptually' (Block, 2013, p.175) though he does not argue for this claim. In response to this, I accept that in this experiment, *all* of the Gabor patches were perceived and processed to a high degree of detail in the visual system, but this need not imply that a representation of each one of them was phenomenally conscious. This point is important with relation to the controversial middle 'A' in figure 1. It may be said that in order for subjects to be able to make judgements about how congruous or cluttered the group of 'A's is, information about the middle 'A' must be processed to a high level of detail in the visual system. Again, this is true, but the issue here is not whether the visual system processes information about the middle 'A' but whether the 'A' is actually represented in phenomenal consciousness. We know that a great deal of visual information is processed unconsciously (e.g. Milner and Goodale, 1995), so the fact that the crowded items in figure 1 and in the Petrov and Popple experiments are *perceived* does not by itself tell us anything about whether they are phenomenally conscious. I shall have more to say about unconscious perception in §4.

### *§3.2-Objection 2.*

Block claims that if we are to accept that the textures that are phenomenally conscious to the subjects in the experiments have a high level of detail, then in the end there will be no difference between seeing the texture and seeing the objects that comprise it. Block says this:

‘[m]aybe a texture can be letterish but can it be A-ish or Times-Roman-A-ish? If one allows such detailed textures, it is not clear that there is any incompatibility between seeing textures and seeing objects that compose them. One can see an object and at the same time see it as fitting into a pattern that includes other objects’ (2013, p.176).

I say two things in response to this. Firstly, the texture that I have suggested need not represent the group of letters in this much detail in order to explain subjects’ abilities. The texture in question need not represent the group as a collection of Times-Roman-A’s. Rather, all that the texture required would have to represent is that the group contains *at least one* ‘Times-Roman-A’ (which will be one of the flankers, to which we *can* direct attention) and that the group is also cluttered and congruous, the middle letter does not itself need to be represented as a ‘Times-Roman-A’. From this level of detail, subjects’ inferences can do the rest. So there is an important distinction between the level of detail of the texture that I have suggested and the level of detail of the texture that Block is here criticising.

Secondly, even if we waive this point, there is good reason to think that Block’s claim here begs the question. It is one of the main contentions of the texture interpretation that we can see a group of items collectively along with some of their features without seeing all of the individual items that make up the group. This is familiar from discussion of the speckled hen, where it is claimed that we can see a speckled hen without seeing each of the speckles that makes it up. This kind of experience seems ubiquitous, often we will see a brick wall from a distance, and judge that it is a brick wall, and indeed our experience makes us able to tell a great deal about each individual brick that makes up the wall (such as that it is red, of a certain shape etc.) but it is at the very least not clear that we have a phenomenally conscious representation of each brick individually. So to insist that we cannot represent something as a collection of ‘Times-Roman-A’s’ without representing each individual A seems to simply assume one of the core claims that Block’s opponents would deny.

### §3.3-Objection 3.

Block refers to another example of crowding to support his case (fig.2).



**Figure 2. From Intriligator and Cavangh (2001): Wiley and Sons, Inc. Reproduced with permission.**

When one fixates upon the cross, one will be able to attend to some of the bars, though not each one of them individually. Block claims (contra Tye, 2009a and 2010) that we see each individual bar, even those that we are unable to attend to, and notes as evidence for this the fact that the bars are differentiated in experience from the background, and that '[o]ne can see the white space in between the items' (2013, p.177). This Block takes as evidence that we consciously see each individual bar, he thinks this is 'obvious' (2013, p.177).

An alternative interpretation is that we see a collection of 'black bars and white spaces' without seeing each individual bar and each individual white space. This would explain how subjects know that there are white spaces there. It may well also be that subjects can differentiate the left-most bar from the background and the right-most bar from the background (because they can attend to these bars) and then infer, again based on properties of the group such as congruity and uniformity, that *all* of the bars are differentiated from the background. This would explain how subjects are capable of differentiation of the bars from the background, and are aware of the white spaces, without committing us to the claim that each bar and each space is individually consciously seen.

#### *§4-Unconscious Seeing.*

Block discusses more empirical data concerned with object seeing and attention. He references an experiment by Freeman and Pelli (2007) where subjects were exposed to a collection of letters (sometimes crowded, sometimes not), and then after the letters disappeared from the screen, the subjects were cued to recall one letter. It was found that subjects' abilities for recall of crowded letters and uncrowded letters were the same, but that subjects' abilities significantly decreased when exposed to Armenian letters rather than Roman ones (see Freeman and Pelli, 2007, p.8). This Block takes as evidence that seeing the crowded items depends upon letter-recognition (2013, p.180).

Block claims that before the cue, the crowded letters were each individually seen, even though attention was not directed upon them. Part of Block's case here is that each letter was not perceived as a 'bag' of unorganised features but specifically as 'letter-representation' (2013, p.180), and also that there is no positive reason to think that the crowded letters were each subject to attention (2013, p.182). Block does, however, accept that the crowded letters were likely seen *unconsciously*. In order to maintain this claim, Block argues that 'seeing' is a natural kind that has conscious and unconscious subkinds (2013, pp.180-181). Block concludes thus:

*'[s]ince unconscious seeing is still seeing, seeing an individual item is compatible with failure of object-based attention to it. So the Freeman and Pelli experiment shows that there can be seeing an object-even if unconscious seeing-without attention to that object' (2013, p.180).*

Block says: 'I have not argued against the possibility that what is in consciousness in Freeman and Pelli is merely textural until the cue' but that 'object seeing (if only unconscious object-seeing) is compatible with the lack of object-attention engendered by crowding' (2013, pp.181-182). Block also notes that 'the Freeman and Pelli experiment suggests that crowded object seeing does not have to be merely textural' (2013, p.182).

This argument would be a problem for someone who claimed that all (conscious or unconscious) perception of crowded objects *had* to be merely textural, or that all (conscious or unconscious) object perception was impossible in the absence of attention, but I see no reason for an opponent of CC to hold either of these claims. Block's opponents can accept the main claim that *unconscious* crowded object seeing may not be textural, and may occur in the absence of attention but still claim that *conscious* object seeing cannot occur in the absence of attention, and that *conscious* perception of crowded items is textural (or, at least, that it is textural when the crowded objects escape attention).

Perhaps we might extend the remit of Block's argument and claim that since unconscious seeing of crowded objects is compatible with an absence of attention we have good reason to think that conscious seeing of crowded objects is as well. However, this would be an illicit leap, as many of Block's opponents (e.g. Prinz, 2012) would claim that attention is precisely what makes the difference between something's being unconscious and its being conscious, so to infer from the fact that something unattended to can be perceived unconsciously to the claim that it can be unattended to and perceived consciously would be to assume that attention is not what makes the difference between something's being unconscious and its being conscious, which is precisely what Block's opponents would deny. It is certainly true that much unconscious perception occurs in the absence of attention, but if what we are interested in is the question of whether there is a link between attention and consciousness, I do not think this should worry us.

*§5-Conclusion.*

The contrary interpretation of the data that I have suggested allows us to keep the relationship between object attention and conscious object seeing very tight, and thus in the

absence of reason against it, we need not commit to CC. For this reason, Block's argument is unsuccessful.<sup>2</sup>

### References

Block, N. "The grain of vision and the grain of attention." *Thought*. **1** (2013): 170-184. DOI: 10.1002/tht3.28

Dretske, F. "What Change Blindness Teaches us about Consciousness." *Philosophical Perspectives* **21** (2007): 215-30.

Freeman, J. and D. Pelli. "An Escape from Crowding." *Journal of Vision*. **7.2** (2007): 1-14.

Intriligator, J., and P. Cavangh. "The spatial resolution of visual attention." *Cognitive Psychology* **43** (2001): 171-216.

Milner, D. and Goodale, M. *The Visual Brain in Action*. Oxford: Oxford University Press, 1995.

Petrov, Y. and Popple, A. V. "Crowding is directed to the fovea and preserves only feature contrast." *Journal of Vision*. **7.2** (2007): 8.1-9.

Prinz, J. *The Conscious Brain*. New York: Oxford University Press, 2012.

Siegel, S. "How does visual phenomenology constrain object-seeing?" *Australasian Journal of Philosophy*. **84.3** (2006): 429-41.

Tye, M. "A New Look at the Speckled Hen." *Analysis*. **69** (2009a): 258-63.

-*Consciousness Revisited*. Cambridge: MIT Press, 2009b.

- "Attention, seeing and change blindness." *Philosophical Issues*. **20.1** (2010) 410-37.

---

<sup>2</sup> Thanks to two anonymous referees for detailed comments on an earlier draft of the paper.

Wolfe, J. M. and Horowitz, T.S. "What attributes guide the deployment of visual attention and how do they do it?" *Nature Reviews: Neuroscience*. 5.6 (2004): 495-501