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Commentary

Measuring any conscious content versus measuring the relevant conscious content: Comment on Sandberg et al. ☆

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ABSTRACT

Sandberg et al. show that the Perceptual Awareness Scale (PAS) scale is sensitive compared to confidence ratings and wagering in detecting accurate perception. They go on to argue that the PAS scale is hence a sensitive measure of conscious perception compared to confidence ratings, a claim disputed here. The fact that some visual content is conscious does not entail that the visual content relevant to making a discrimination is conscious. For example, if one saw a square but was only aware of seeing a flash of something, then one has not consciously seen a square. When PAS and confidence ratings come in conflict, we suggest that it is confidence ratings that more reliably indicate the conscious status of contents allowing discrimination.

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Sandberg et al. provide intriguing evidence for the sensitivity of the Perceptual Awareness Scale (PAS) scale compared to confidence ratings and wagering in detecting accurate perception, a claim this comment will not dispute. They argue the PAS scale is hence a sensitive measure of conscious perception compared to confidence ratings, the claim we will dispute. As they conclude, asking people about the content of their experience is the most direct way of getting information about conscious content. But what content is the relevant content? In general, just because a person consciously saw the stimulus under some description, that does not mean that the perceptual contents relevant to discrimination performance were conscious. For example, according to higher order thought theory, the content *p* of a mental state is conscious only if the participant is aware of the mental state as having content *p* (cf. Rosenthal, 2005). If one saw a square but was only aware of seeing a flash of something, then one has not consciously seen a square. We will argue that when PAS and confidence ratings come in conflict, it is confidence ratings that more reliably indicate the conscious status of certain contents.

Consider an experiment by Perrig and Eckstein (2005). People were shown mirror script like that shown in Fig 1a. Fig. 1b shows the top half only; the bottom half is its mirror inversion. Words constructed in this way can be very hard to see consciously as words. Perrig and Eckstein used such stimuli as markers for the start of each trial, and were displayed for 750 ms; subjects then completed a stem which, unbeknownst to them, could be of the word just displayed or another word. Perrig and Eckstein demonstrated a robust priming effect caused by the mirror stimuli even in people who denied noticing the mirror stimuli were anything other than odd shapes. Taking subjects at their word, does this constitute a case of subliminal perception?

In this experiment participants were presented primes which they should have seen completely clearly. Perception was (let us suppose anyway) maximally conscious according to the PAS scale (i.e., subjects might report something akin to ‘absolutely clear image’). The point is that it was conscious under some description (“funny shape”, “first shape like theta with a

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Fig. 1. (a) Mirror script from Perrig and Eckstein (2005). (b) The top half only.

knob”, etc.) but not under the description e.g. “the word ‘awareness’”. In this case, one can conclude that participants did not consciously see it as the set of letters that they unconsciously saw it as, as shown by their priming. In principle, one could imagine participants saying they saw the stimulus clearly but they were guessing as to whether it was a coded version of word X or Y. Thus, confidence ratings rather than PAS would reflect the actual conscious status of the content that the sequence of letters making up word X was presented. Similarly, in Sandberg et al.’s experiment, people may have the experience of having a glimpse of something, while not representing anything about that glimpse as indicating which stimulus it was. Thus, they may believe they saw nothing that distinguished the shapes from each other. Perception of *the fact it was a square* could be entirely unconscious even as participants knew (with varying clarity as measured by PAS) that something was presented. But of course, participants in these experiments will always be aware of seeing something in the world (unless they blink), even if they think they are seeing a blank screen; the question is not whether they were aware of seeing something was present but whether the content we can infer from discrimination performance was conscious. Confidence ratings of course are imperfect and have to be applied carefully (see for example Dienes and Seth (2010), for how gambling can be effectively used as a confidence measure), as we discuss below, but they can be more relevant to detecting unconscious perception than the mere fact the person was aware of seeing under some description or other.

Presumably the more one sees consciously of the event, the greater one can see anything at all, even unconsciously. So it is not surprising that consciously having a vague experience results in greater performance than not consciously seeing anything of the event at all. That is, the relation between PAS and accuracy for the PAS scale points of “no experience” and “vague experience” is consistent with the perception of what shape was there being entirely unconscious. Under yet better stimulus presentation conditions, one’s conscious experience may contain information about a feature but one represents that feature only unconsciously, as in the Perrig and Eckstein example. Although confidence ratings conceptually fare better than PAS in these cases, this does not mean confidence ratings are perfect. The difficult case for confidence ratings as a tool for measuring conscious awareness arises when one consciously sees some aspect of the stimulus and uses it to make a decision, but does not believe the aspect was informative, even when it was. In this case, people may believe they are guessing even though all perception was conscious. This case – in which confidence ratings would underestimate conscious experience compared to PAS – requires people to *systematically* use some information despite believing it is not useful *in any way*. If they used the fact that they saw some aspect of a stimulus and believed it was useful, people would have some confidence. The use of very simple stimuli, as in Sandberg et al.’s experiment, should make the relevance of aspects of stimuli obvious. For example, seeing a straight line or a corner definitively rules out a circle. Seeing a 60° corner determines a triangle, given the available options. Thus, being aware of seeing aspects of a stimulus naturally leads to an increase in confidence.

In the end, understanding the fine-grained nature of people’s conscious experience requires the thoughtful use of a number ways of probing what content people are aware of, and in this context both PAS and confidence ratings certainly have a role to play. But we argue that in typical cases, confidence ratings rather than PAS are conceptually closer to what is needed to determine whether the content allowing successful discriminations is conscious.

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