About visual manipulation

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Abstract: The paper presents some aspects of manipulation applied to visual perception like a consequence that seeing does not consist in the creation of a "re-"presentation of the world inside the brain, but like pre-existed knowledge in our memory.

1. Introduction

What is seeing? Is making an internal representation or a comparison with something we already know? There are two different opinions over the same aspect. The representations from figure1 are parts of a study realized by J. Kevin O'Regan from Laboratoire de Psychologie Expérimentale, Centre National de Recherche Scientifique, Paris, France and Alva Noe Department of Philosophy University of California, Santa Cruz.

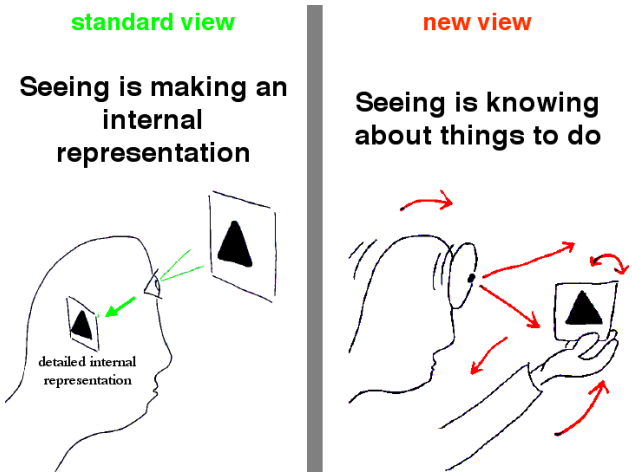

Figure1. What is seeing

It is considered that seeing consists in making an internal representation of the outside world but also knowing the changes that these things will produce inside the brain. From this new point of view, seeing represents not only a feeling, but something connect with education and may be with manipulation, so not entirely physical. So, there are some non-physical mechanisms because brain create experience but also actions based on some knowledge. Instead of the role of the brain being to generate the experience of seeing, the role of the brain simply becomes that of generating the exploratory activity which underlies the seeing, and that of holding the knowledge of current possibilities for action that underlies seeing.

2. Considerations about visual manipulation

When visual system processes something, this action does not necessarily mean a seeing process. Seeing is only when somebody is currently exercising all capacities it is able to use in that particular moment. When we look at an object, we can be conscious of a number of its aspects: its colour, its identity, its background, its position, etc., so only the aspect is currently checked. So other aspects, even if they are being directly looked at, will not be seen.

Figure2. Ambiguous figures

Ambiguous figures and figure-ground competition actually provide examples illustrating this. In the figure 2, we can be fixating on the white nose and not see the black nose, even though it is in the same location.

In the figure 3 there are some other r examples: we can stare at the left figure for minutes and still think it says "The illusion of seeing". But actually it doesn't; it says: The illusion of seeing. The right figure exemplifies the left-right conflict: the right part of the brain tries to say by recognizing the colour, but the left part of the brain insist on reading the word.

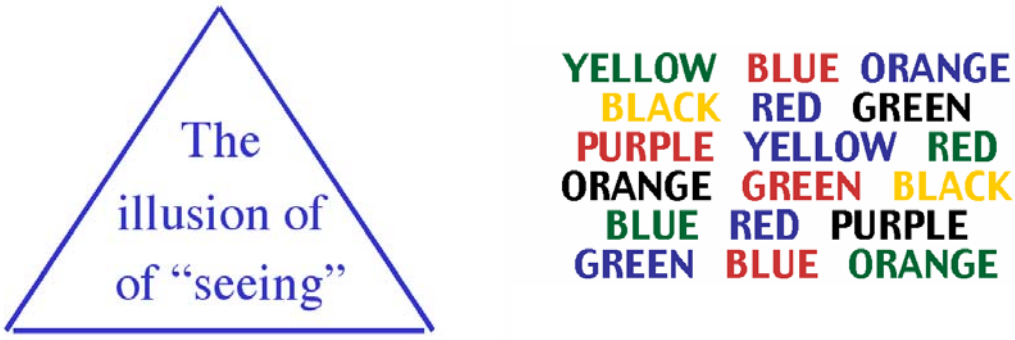

Figure3 Cognitive manipulation

Seeing is mentally manipulating some aspect of the scene. A natural and principled approach to the problem might be available if we adopt the view that seeing is a kind of knowledge about what happens when we do certain things. Driving a car feels different from driving a truck or riding a bicycle, because it involves doing different things. Similarly, seeing feels different from hearing, tasting, touching, because it too involves doing different things. Contrary to our intuitions, memory and visual experience might actually be one and the same kind of thing: both involve knowing ways of getting at information: in one case the information is in the brain, in the other case it's in the outside world. In the case of memory of verbs, for example, we know we can recover the conjugation of a particular verb by attending to that verb. Analogously, in the case of seeing, we know we can recover information about some object in the scene by paying attention to it.

Seeing represents a form of knowledge. This led us to postulate that the impression we have of seeing everything in the visual field is actually a sort of illusion, generated by the

immediate availability, by a mere flick of the eye or of attention, of visual information. This new approach seems to have some very interesting advantages:

- Visual experience is not generated by the brain, but by exploring the reality. There are no brain mechanisms that generate experience.
- The new approach explains the ineffability of sensation.
- The new approach may do a classification of certain mental states like memory, wealthiness, and sensation.

1. Visual perception - a natural brain manipulation

Many people are familiar with facts of visual perception such as the Poggendorf, Zöllner, and Ponzo illusions, the illusion of dizziness, the Moon illusion, afterimages and aftereffects such as the McCulloch effect and the waterfall and other movement illusions, brightness and contour illusions like the Cornsweet-Crane illusion and the Kanisza triangle. Whole domains of study related to contrast sensitivity, movement perception, colour vision, stereopsis, and pattern recognition are the every-day interest of specialists in visual science. But all these phenomena are eclipsed by what I call the "real" mystery of visual perception: how can we see so well with what an engineer would consider a very badly constructed visual system? Why do we not notice optical aberrations, differences in resolution, defects in retinal structure, and the smear and displacement caused by eye movements? Why does the visual world seem so rich and so perfect to us?

It is important that we abandon the idea that "seeing" involves passively contemplating an internal representation of the world that has metric properties like a photograph or scale model. Seeing constitutes an active process of probing the external environment as though it were a continuously available external memory. This allows one to understand why, despite the poor quality of the visual apparatus, we have the subjective impression of great richness and "presence" of the visual world. This richness and presence are actually an illusion, created by the fact that if we so much as faintly ask ourselves some question about the environment, an answer is immediately provided by the sensory information on the retina, possibly rendered available by an eye movement.

Seeing does not involve simultaneously perceiving all the features present in an object, but only a very small number, just sufficient to accomplish the task. The subjective impression we have of seeing whole objects arises first because the retinal stimulation is very rich and so provides the impression that "a lot of stuff is out there", and second because if at any moment we want to know what exactly any of that "stuff" is, we just use our retinas and eye movements to find out.

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