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The Visual Experience of Kinds

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THE VISUAL EXPERIENCE OF KINDS

by

ANDREI MARASOIU

Under the Direction of George Graham

ABSTRACT

Do perceiving subjects represent kind properties in the content of their conscious visual experience when they see and recognize instances of those natural kinds? In Part 1 of my thesis I clarify this question, in Part 2 I answer it, and in Part 3 I raise a problem for previous answers. Part 1 conceives of conscious experience in an internalist way, and the unified conscious episode does not exclude having beliefs about what one sees. Following Siegel (2006) and Bayne (2011), Part 2 formulates two arguments in support of representing kind properties in the content of experience. In Part 3, I argue that attempts to distinguish visual experiences from visual beliefs might fail to account for the interplay of sensory and cognitive elements in visual object recognition. I conclude by suggesting it has not been established that visual experiences can be distinguished from visual beliefs.

INDEX WORDS: Kind properties, Object recognition, Visual experience, Beliefs, Concepts, Category deficits, Associative visual agnosia, Blindsight

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INTRODUCTION

When you see a rosebush, or a running dog, you are having a visual experience. Are *kind* properties (such as being a rose or being a dog) *represented* in the *content* of your *conscious* visual experience? Siegel (2006) and Bayne (2011) have argued for an affirmative answer. But the support they provide for this claim falls short of carefully distinguishing the content of the visual experience had, from the content of the belief entertained following the perceptual episode – believing from seeing.

In this essay, I support Siegel and Bayne's conclusion that kind properties are represented in the content of conscious visual experience, and I inquire into the extent to which seeing differs from believing in the case of representing kind properties. The starting points of my inquiry will be Siegel and Bayne's own justifications for their conclusion, the strengths and weaknesses of which may make my own concluding remarks more plausible. As I proceed, I suggest ways in which approaches critical of Siegel, Bayne (and others) may also help cast light on what it might mean to see natural kinds, or to say human visual experiences deliver contents, or to say that properties are represented in such contents.

Restricting the discussion throughout to seeing instances of natural kinds (plants and animals will be primarily discussed), I will argue that the distinction between seeing and believing what you see is not a phenomenally transparent distinction, but may perhaps be made at finer-grained levels of analysis, such as what a cognitive-functional approach, or a neuroscientific approach, might provide. Whether there will actually turn out to be a distinction between seeing and believing at these levels is an empirical question, and it is an open question. I will speculate on the extent to which the conceptual distinction between seeing and believing (a distinction that is *prima facie* intuitive, and part and parcel of folk psychology) could be challenged on empirical grounds.

The thesis is divided into three parts. In Part 1, I try to clarify the question of what it might mean for kind properties to be represented in the content of conscious visual experience. As I will suggest, the

contents of experience will be understood broadly enough so that it does not *presuppose* any distinction between experience and forming or having beliefs. In Part 2, I provide two related arguments in favor of the thesis that kind properties are represented in the content of visual experience (as understood in Part 1): an argument from the application of the method of phenomenal contrast (originated with Siegel), and an argument from visual agnosia (originated with Bayne). In Part 3, I explore the comprehensive notion of experience used in Part 1 to formulate a problem for the traditional divide between seeing and believing. I will argue that cases of visual object recognition (especially the recognition of living things explored in Part 2) pertain both to seeing and to believing.

1 CLARIFYING THE QUESTION: “ARE KIND PROPERTIES REPRESENTED IN THE CONTENT OF CONSCIOUS VISUAL EXPERIENCE?”

In addressing the question, at least two things have to be expanded on (briefly): what the content of conscious visual experience is, and what kind properties are understood to be in this context. I will approach each subject in its turn.

1.1 *The content of conscious visual experience*

In this section, I provide a working understanding of what will be meant by the content of conscious visual experience in what follows. This approach is by no means meant to be definitive, but only to give a clear indication of how contentful visual experiences will initially be understood in this thesis. Elaborations and refinements are to be found in subsequent sections.

So how will the content of visual experience be initially understood? Here is an example. Suppose Judy, a florist, has just finished gathering a bouquet of red roses, and is looking at them. She is paying keen attention to how many there are, and in what condition, trying to guess how long it will be before they begin to wither. Judy is having a *visual experience* in the full-blown sense of the phrase

(whose threads will be explored momentarily). She is a conscious and perceptually unimpaired sentient adult. She is aware of seeing the roses, and there is something it is like for her to see the roses exactly when and how she does (Nagel 1976/2002).

Judy's visual experience has content – the roses she is seeing. But what does it mean to say the roses are part of the content of Judy's experience, and why is saying so a gain over ordinary parlance about perception? Mention of the content of experience occurs in philosophical discussions about the nature of perception, and visual content is defined differently by philosophers holding differing views about what the nature and purpose of visual perception might be.

One view, the uncompromising externalist view about mental content, roughly goes as follows (Putnam 1973, pp. 700-704): Judy sees roses only if there actually are roses in the external world that Judy is looking at. If there actually are no such roses, then Judy's visual experience lacks content. On this view, visual perception is only contentful when veridical; seeing is an achievement putting the perceptual subject in direct contact with the external world.

An amendment is possible, leading to a second view. Suppose Judy likes her bouquet of roses so much that she sends a picture of them to Mark. Mark will see the picture (a bit of cellulose), not actual roses. Suppose he is intensely looking at it and stops seeing it as just a piece of paper. In seeing the picture, he will see the photographed roses. For Mark's *visual* system, if he focuses only on what is in the picture, a photographed rose (a pictorial representation) and the rose photographed (a thorny physical object) will *look* the same, even though they *are* different. Mark can have a rose-involving experience without there actually being any roses seen (say Judy has meanwhile burnt them). For Mark, seeing a snapshot of roses is *perceptually* equivalent to seeing the real thing (modulo resolution, etc.). So an improved understanding of an experience's content might say that the visual experience's content is fixed by whatever is perceptually equivalent to the objects seen.

On this second view (Peacocke 1992, pp. 105-110), the content of an experience is fixed by the

correctness (or accuracy) conditions had by the experience: the content would be what *would* have to exist *if* the experience were to be accurate, or correct with respect to what is being perceived. This does not entail that the content of experience actually exists when seen, witness Mark's experience of roses. If so, visual perception is contentful only when the visual scenario (Peacocke 1992, p. 115) is phenomenally *indistinguishable* from the actual world. If the photo could span all of Mark's visual field, and if hue, brightness, resolution, etc. were controlled for, Mark could not distinguish a photo from the real thing no matter how hard he looked at the photo.

The content of Mark's visual experience will be the rose as represented by Mark's visual system in all possible situations compatible with what Mark visually experiences (Barwise and Perry 1981, p. 674 ff.). On this second view, seeing is still weakly *veridical* - inasmuch as the actual perceptual situation is only one among many perceptually accessible situations. One consequence of the view is that strongly non-veridical experiences (say of physically impossible situations) lack content. But seeing is only *weakly* veridical – since there are possible perceptual alternatives to the actual perceptual situation that are phenomenally indistinguishable from it.

A third view is yet possible, capitalizing on an ambiguity in what perceptual and phenomenal alternatives are. One way to understand them is as relations between organisms and the environment such that if a perceiver's sensory apparatus is working properly and the perceiver is properly situated in the environment relative to the stimulus, then, actually, the appearances of the stimulus ought to be so as to elicit an experience having that stimulus as its content. This is the externalist alternative (Barwise and Perry 1981). In the absence of first-hand perceptual reports delivered by Judy, her having a visual experience of roses would have to be ascribed only from the third-person point of view.

Paying heed to Judy's experiences requires Judy herself to recount what it is like for her to see what she sees, what the phenomenal appearances of the content experienced might be as experienced by the perceiver herself/himself. Consider Mark again. Mark can have visual imagery of the roses seen in

the photograph, and if that imagery will be vivid enough, Mark could go on to say he *sees* the roses, or at least that what the visual experience is like *for him* is indistinguishable from one in which he actually saw the roses. Unlike the externally-ascribed perceptual alternatives, phenomenal appearances can only be described perspectively, from the first-person point of view (Graham and Horgan 2008, pp. 93ff.).

However, as long as veridicality is still assumed (as long as the actual perceptual appearance has to be among the phenomenally indistinguishable alternatives), there will always be a problematic case, namely, what happens when the subject experiences something *as if* seeing, subjectively indistinguishable from seeing, but non-veridical. There are cases where the relevant bit of the external world is not among the phenomenally accessible situations, so weak veridicality fails to obtain. Visual hallucinations are a paradigm example, especially those present in the Charles Bonnet Syndrome (CBS, hereafter), more frequent in old age, and associated with macular degeneration and loss of peripheral vision (Teunisse et al. 1995, pp. 256-257). CBS patients experience vivid visual hallucinations, and would testify to what they *see* (in an internalist, non-factive, and perspectival, sense of “see”), even though there is no external object seen by them (in the externalist's achievement sense of “see”).

Many CBS visual hallucinations (say of bugs or flowers) are weakly but not strongly veridical: there could actually be seen bugs or flowers, but there happen to be none. However, some CBS visual hallucinations are *strongly* non-veridical, i.e., physically impossible. Rocha et al. (2012, pp. 553-554) tell the story of a 95-year old woman who hallucinated small pumpkins growing underneath her skin, and then breaking out of her skin. She was also cooking for her family, only to *see* lettuce crawling on the kitchen table. As Rocha et al. (2012) report, the patient insisted that she genuinely saw what she hallucinated. Subjectively, there was no difference.

Given that what we are seeking to characterize is the phenomenal content experienced in seeing, it would not help to characterize vision (as opposed to hallucination) by the necessary presence of the stimulus (Langsam 2000, p.273), since for the 95-year old patient above there was no subjective

difference associated with the presence or absence of the stimulus. Moreover, as Teunisse et al. (1995, p. 256) describe the Bonnet syndrome, about one third of the subjects over 64 years-old in the Netherlands group they tested had experienced complex visual hallucinations at least once during their lifetime.

Strongly non-veridical visual experiences are subjectively just as vivid and complex as episodes in which seeing reaches out to actual external objects. CBS hallucinations suggest that proper functioning of the visual system and proper external causal ancestry of the content of experience are, albeit desirable, *not* necessary in order to have a full-blown visual experience.¹

So where to turn to individuate the content of experience in a manner that is fully general, *regardless* of veridicality? CBS patients call what they experience “seeing” just as normal perceptual subjects do; both patients and normal perceptual subjects are often just as able to introspectively report on what they see (from the inside). Ask Mark what he sees when looking at the photo: he will say he sees roses (even after Judy tells him she burnt them). Conscious experience individuates its content by its phenomenal character (Graham and Horgan 2008, pp. 98-101), by what the experience is like to the experiencer, and then puts it into words in the introspective report. The strongly non-veridical visual experience of the CBS patient described by Rocha et al. (2012) was visual, and had an introspectible phenomenal character, just like veridical visual experiences may have.

Contrary to confabulation accounts of introspection (Dennett 1988), naïve perceptual subjects (unimpaired or impaired as they may be) are the only ones having privileged access to what they themselves experience, and they have the requisite first-person authority to tell *us* what *they* experience. Confabulation is, of course, never completely excluded: some patients are bad at introspecting, some others are prone to story-telling. But such phenomena might be marginal. Since the content of conscious experience is the phenomenal content experienced by the normal subject or

1 In the sense elaborated by Peacocke (1992) and Siegel (2010), these patients have visual experiences that dramatically fail to represent the world, since their experiences have no accuracy (or correctness) conditions.

patient (even when it is inaccessible to another person similarly situated in the environment), introspection (while not always in agreement with what could be ascribed from the subject's situation in the environment) is typically tuned to what the subject or patients themselves take themselves to have experienced or be experiencing.

So far, I have sketched an internalist position about the content of conscious visual experience, a view on which what content is being experienced can only be fixed in introspection by the experiencer himself/herself (Graham and Horgan 2008). The illustrations I have provided (roses, photos thereof, CBS hallucinations) are merely illustrations, and I do not claim to have rebutted alternative views about mental content, but merely to have indicated why the position I sketch might seem intuitively appealing. Externalist views relying on guises or modes of presentation or notions under which objects are perceived (e.g., Schiffer 1992), or dual-content theories relying on an externalist and an internalist component of content (Chalmers 2002) could find much of the discussion to follow congenial and appropriate many of its conclusions.

If the content of conscious visual experience is fixed by introspection, what do patients introspect? Will it be the content of their visual beliefs, or of their visual experiences, or both? CBS patients' and others' hallucinations often pertain to delusional disorders, where there is a currently open and engaging debate about how belief and experience are blended into one another (Stephens and Graham 2000, pp. 35-40). The 95-year old CBS patient gradually found herself *believing* small pumpkins were growing under her skin, seeing bumps, and then *seeing* the pumpkins tearing her skin and breaking out as many plants grow out of the soil (Rocha et al. 2012). The *puzzle* is this: can we account for the strong tie between seeing and believing at the phenomenal level, while trying to avoid collapsing seeing into a species of believing, viz. believing what one sees? In Part 3, I will develop this puzzle, and indicate how it bears on the claim that kind properties are represented in the content of our conscious visual experience. But meanwhile I will be using the phrase “conscious visual experience” in an inclusive,

comprehensive sense, as standing for the overall phenomenology had in the unified conscious episode during which an experiencing subject undergoes a visual experience (and perhaps other concurrent experiences as well, *including* entertaining beliefs).

1.2 Seeing natural kinds

The debate I plan to approach in this thesis concerns whether kind properties are represented in the content of conscious visual experience. Commentators of Susanna Siegel – Brogaard (2013), Logue (2013) – have interpreted her claim as referring to natural kinds, encouraged by her explicitly non-artifactual examples (trees, not telephones). In order to discuss whether Siegel's claim is true, I have to articulate and depart from Brogaard and Logue's notion of natural kinds.

A very charitable reading of Siegel's claim (2006, pp. 484-485) that kind properties are represented in the content of conscious visual experience is to say that, e.g., when Judy sees a rose, she sees a member of a natural kind, so she represents the natural-kind property of being a rose in the content of her visual experience. This claim is nearly vacuously true: anytime an instance of a natural kind will be seen, that kind would then be said to figure in the content of the experience had.

The interpretation, while charitable, blurs the distinction between the object seen (if any) and the content of the visual experience had. Remember Mark's case: what he was seeing was not an instance of a natural kind (a rose), but an instance of an artificial kind (a photo, a bit of cellulose). Nonetheless, in seeing the roses *in* the photograph, Mark could be said to have represented the property of being a rose in the content of his conscious visual experience. In order to forestall such misunderstandings, Siegel (2006, p. 482; unlike Brogaard 2013 or Logue 2013) prefers to speak of the representation of kind properties in the content of visual experience. When seeing instances of natural kinds, one would be representing *kind* properties (whether they are natural or not).

In order to be able to represent such kind properties, Mark had to see the roses photographed

not as something-or-other that is pictured, but *as* roses. The aspects seized upon by Mark typify the roses pictured: Mark should *recognize* the roses pictured for what they are. So seeing roses and representing the property of being a rose in the content of one's visual experience is the most important case of seeing-as, the case of object recognition.

An uncharitable reading of Siegel's claim would construe it as saying that natural kinds (even ones we would not expect to be able to be in sensory contact with, such as subatomic particles) can be literally seen. The interpretation relies on two misunderstandings of Siegel's claim. First, Siegel seems to be referring to natural-kind properties not in the sense in which philosophers of science and metaphysicians use the term (so as to include electrons, etc.), but in the sense in which the phrase "natural kinds" is used by developmental psychologists (e.g., Carey 2011, pp. 119-120). Children are said to be able to discriminate first living things from non-living things. Then discrimination of living things breaks down into a more fine-grained discrimination of plants and animals, while the non-living things start to be seen as artifacts (Rudder Baker 2004, pp. 102-104).

As conceptual development continues, children's grasp of plants is refined into grasp of trees and edibles, and then edibles are identified as either fruit or vegetables (Rogers and McClelland 2007, pp. 694-697). An interpretation I propose that seems to be in agreement with the examples Siegel gives (e.g., seeing a pine tree) is to understand the phrase "natural kinds" as it is used in the literature on early conceptual development, namely, as referring to the ability to recognize and single out living things, familiar plants and animals (oaks, dogs, etc.).

True, "natural kinds" for developmental psychologists are seldom both natural and kinds. If they were genuine kinds, then they ought to persist, whereas the conceptual development of children quickly leaves behind the very general dichotomy of living vs. non-living (Carey 2011, p. 117 ff.). If they were genuinely natural, then they ought to be found in nature, whereas one never sees *sui generis* living things, and *sui generis* non-living things, but only, e.g., individual dogs, birds, buildings, and pieces of

furniture. This is why I will avoid mention of natural-kind properties in what follows, and will understand kind properties to be those properties represented in visually recognizing the objects that belong to those kinds. The kinds would be represented as acquired by the perceiver-learner in visual experience or in conceptual development (more on this dichotomy in Part 3).

Secondly, in claiming kind properties are represented in the content of conscious visual experience, Siegel cannot be claiming that kinds or classes are genuinely seen. Abstract objects like classes or kinds are not ordinarily said to be seen. *Pace* revisionist views in the metaphysics and epistemology of mathematics (Prinz 2006, pp. 434-435), only concrete objects can be seen. So what might it mean to say that *kind properties* are represented in the content of experience? The answer I tentatively advance is that representation of kind properties in the content of conscious visual experience is the *explanans* that Siegel (2006) advances whose *explanandum* is the recognition of individual living things that necessarily belong to the kinds (or categories) that the experiencer will have acquired in early conceptual development. For example, Judy's recognition of what she sees as a rose will be explained (if a representational theory of mind is assumed) by a mental representation Judy forms, a representation whose content includes the property of being a rose.

How does one move from presentation of objects in visual experience to their *representation* in the content of conscious visual experience? I will be following Siegel (2006, p. 482) in assuming a representational theory of mind, one on which mental states had by the experiencer throughout the experience have a content that represents what is being experienced. The worldly property of being a rose is represented in Judy's mental state produced by her rosy seeing. On the representational view (Fodor 1983), representations are made available to further information-processing (categorization and inference), explaining the cognitive-functional role representations have to play that undergirds conscious mental activity. But I will be understanding representations in a shallow sense that seeks reconciliation with connectionist approaches to the architecture of brain circuitry (Schneider and Katz

2012) and to the possibility of modeling learning in such networks (Graham 1990).

So far, I have tried to clarify the way I understand Siegel's thesis that kind properties *can* be represented in the content of conscious visual experience. I have suggested this possibility is actualized when familiar plants and animals (instances of developmentally understood natural kinds) are *seen and recognized* by the experiencing subject. In Part 2, I will present and offer further refinements to two arguments that have been advanced in favor of Siegel's claim: the method of phenomenal contrast, and the argument from visual agnosia.

2 ARGUMENTS FOR THE CLAIM THAT KIND PROPERTIES ARE REPRESENTED IN THE CONTENT OF CONSCIOUS VISUAL EXPERIENCE

In this second part of my thesis, I formulate and comment on two arguments that have been proposed in favor of Siegel's (2006, pp. 484-485) claim that kind properties can be represented in the content of conscious visual experience. In section 2.1, I present Siegel's own method of phenomenal contrast, and how it supports her claim. In section 2.3, I present Tim Bayne's argument from visual agnosia, and highlight some methodological presuppositions of the success of that argument. I end Part 2 by sketching a problem that will be developed in Part 3: whether we can distinguish seeing from believing what one sees when visual recognition of living things occurs.

2.1 *The method of phenomenal contrast*

In order to ascertain whether a given property or object is represented in the content of visual experience, Siegel (2007, pp. 135-140) advances her method of phenomenal contrast. To get the flavor of the method, here is a starting case. Suppose Hannah sees an unknown tree (that happens to be Plato's olive tree on the Acropolis). Hannah then gains repeated exposure to that kind of tree. Later on finds out it is an olive tree, having meanwhile become able to recognize olive trees. If Hannah were to compare in

introspection the visual phenomenology had when she first saw the unknown tree, and the phenomenology she had when she visually recognized the olive tree, Hannah would be struck by a phenomenal contrast between her two visual experiences, as a novice experience and as an expert in recognizing olive trees. Siegel suggests Hannah would find that expert experience has a rich content. Recognition would enrich experience because Hannah would now see the olive tree as such (not as an unknown tree), she would be representing the high-level property of being an olive tree in the content of her visual experience.

The phenomenal contrast between the expert and the novice consists in the presence or absence of a feeling of familiarity with the object recognized. What the experience is like involves understanding what is seen. In seeing the olive tree, Hannah could say “Yes, I know what that is – it’s an olive tree!” It turns out it is quite difficult to explain wherein familiarity resides.

There are voices who deny familiarity has anything to do with conscious vision. For Jacoby et al. (1993, pp. 261-264) the feeling of familiarity is a proof of the “automaticity” of recognition in perception. For them, automaticity is by definition not conscious. Flanagan (1992, p. 140) denies automaticity has to be unconscious. He gives the example of a tennis player who no longer pays attention to how he moves his hand, but does it effortlessly, and has a good shot. The kind of automaticity gained by the tennis player’s training (much like Mary’s visual training with oaks in the national park) is fully conscious. Familiarity allows the tennis player to be aware of his hand’s movement without paying any special attention to it. Practice makes better, and makes previously employed visuomotor attentional resources available for deployment elsewhere, where they are needed (“Incoming ball!”). So visual familiarity with what one sees is conscious.

Increase in familiarity with a seen object is associated with a more fine-grained segmentation of the visual field where the object is present (Barsalou et al. 2003, p 89). Assuming that familiarity is related to a difference in representational content rather than visual simulations performed (Barsalou et

al. 2003, p. 87), we understand why the method of phenomenal contrast applied to the case of perceptual learning. Coming to recognize a previously unrecognized object *provides evidence* for Siegel's (2006, p. 482) claim that kind properties are represented in the content of conscious visual experience.

2.2 Phenomenal contrast in overall phenomenology, not factored into cognitive and sensory

Siegel (2007, 2010) connects the method of phenomenal contrast with some other commitments her view has, commitments that I will now argue are independent of the support her method provides for the claim that kind properties are represented in the content of visual experience.

Siegel wishes the method of phenomenal contrast to be appealing to internalists and externalists alike. Internalists could say that Hannah has a richer experience (Siegel 2010, pp. 3-18) when she recognizes the olive tree as opposed to when she was unable to do so. Externalists (Dretske 1969, p. 20 ff.) could praise Hannah's increased power of discrimination, her coming to be able to reliably identify olive trees among other trees. But the fundamental question of how her discriminative powers latch onto her neural circuitry, the circuitry on which her conscious experiential content supervenes, is a widely open empirical question (Sejnowski and Churchland 1990). If Siegel wishes her method of phenomenal contrast to be applicable across the internalist-externalist board, at least a just-so story about how skills are neurally realized has to be possible. In a more epistemically modest vein, and in agreement with section 1.1, I will understand the method of phenomenal contrast in an internalist way.

A second commitment Siegel undertakes is that the phenomenal difference experienced by Hannah - between when she could not recognize the olive tree and when she will have become able to do so - is a difference in purely sensory visual phenomenology, and not one in cognitive phenomenology, nor in some intermediary phenomenology associated to the form (Gestalt) of olive trees. The notion of Gestalt is a historically too important notion to be dealt with lightly, and this is why I postpone a partial clarification until section 3.3. The important question that Siegel believes can be answered in the

affirmative, and what I am skeptical of, is that experiencing subjects can (in introspecting on what their perceptual episode is like to them) distinguish clearly between purely sensory visual phenomenology and cognitive phenomenology. I believe this second commitment that Siegel undertakes is independent from the application of her method of phenomenal contrast. Doubts cast about this commitment should not obscure the support applying her method offers for the thesis that kind properties are represented in the content of visual experience. In the rest of this section, I elaborate on why it seems, intuitively, that experiential subjects are not able to factor out what it is like for them to see from what it is like for them to believe what they see, i.e., to believe they recognize what they see, or that what they see now is (or is much alike) what they will have seen before.

Is the representational difference underlying conscious familiarity part of the content of a conceptually-structured perceptual belief acquired by vision, or is it part of a visual experience pristine of conceptual contents, or perhaps *both*? The question raised (Crutchfield 2011, pp. 290-293) spans many explanatory levels: phenomenal (is cognitive phenomenology different from sensory phenomenology?), computational (is there a difference in how contents of beliefs and experiences are formed, stored, and updated?), physical (is there a different anatomical locus for forming, storing, and making available for further processing contents of beliefs and of experiences?). I will be raising the question in much of its complexity in Part 3, but now I will focus on whether one can separate cognitive from visual phenomenology.

Let me begin with one example. Heil (1982, p.229) retells Hanson's story of J. Kepler and T. Brahe watching the sunset together. Kepler believed the Earth moves around the Sun, while Brahe believed the Sun moves around the Earth. Many authors (Hanson, notably) took the story to support the claim that observation is laden with theory: Kepler and Brahe saw different things because they would have reported what they saw differently. The difference between their reports could *in some sense* be traced back to their holding different cosmological theories. As Heil (1982, p.230) puts it, "seeing is believing."

But Heil is also clear that Kepler and Brahe see *the very same* thing (in the externalist's sense): the sunset. How can both claims be true?

The key is to ask what "seeing is believing" might mean. Kepler and Brahe were seeing-*plus*-believing different things. But they were not doing two separate things (seeing first, believing second) or at least their phenomenology would have strongly resisted this construal (Ryle 1945). The upshot of the example is that whatever difference (if any, not to prejudge) there might be between seeing and believing, it is a difference that is *not* phenomenally transparent to the experiencing subjects.

The Kepler and Brahe example points to the crucial role played by cognitive phenomenology (Pitt 2004) in one's overall phenomenology while seeing. The opponent of the seeing/believing distinction in phenomenology could argue as follows: Kepler and Brahe were equally familiar with the kind *planet*, and yet the reportable content of their respective were different. Therefore, their beliefs about what they saw were *necessary* in individuating the respective contents of their visual experiences. The friend of the seeing/believing distinction might retort that Kepler and Brahe were seeing the same thing yet believing different things. She could complain that failure to decompose overall phenomenology into cognitive and visual at most only shows that perceiving subjects have and use *both*, and *not* that vision itself is cognitively penetrated. The minimal point I make with the Kepler-Brahe example (borrowed from Heil) is that this seeing/believing standoff cannot be resolved by appeal to phenomenology alone.

To conclude the evaluation of Siegel's method of phenomenal contrast, (i) it correctly identifies a phenomenal contrast had in perceptual learning; (ii) it correctly delivers the feeling of familiarity as what accounts for the phenomenal contrast (Hannah and the olive tree example), and (iii) it correctly delivers the representation of kind properties in the content of experience as what accounts for the feeling of familiarity. But, on the other hand, it is a *faux pas* (as the Kepler-Brahe example shows) to assume that visual, as opposed to cognitive, phenomenology best explains the representation of kind properties. In fact, it seems no factoring out of the overall phenomenology into seeing (purely visual, and

informational encapsulated) and believing (purely cognitive and conceptual) could be performed at a phenomenal level.

Saying it is not possible to factor out cognitive phenomenology and sensory phenomenology had when seeing *and* recognizing an object (the sun, or a dog) does not entail there is no difference between seeing and believing. The difference could perhaps still be found at finer-grained computational or neural levels of analysis (Graham and Horgan 2002, §§3-4). Whether such a difference could be made is a matter for Part 3 to approach. This leaves open whether the seeing/believing distinction could be made at a systems-level, e.g., between input-dedicated modules and general, distributed cognition (Fodor 1983). But the two opposing cognitive-scientific hypotheses - of cognitive penetrability and of cognitive impenetrability - are phenomenally indistinguishable.

2.3 Visual agnosia and selective impairments in the recognition of natural kinds

Return to Hannah for a moment: she sees the olive tree, and thereby represents the property of being an olive tree in the content of her experience (which may or may not be conceptually imbued). Is it that Hannah recognizes the *object* as being an olive tree, or that she sees the tree as a proper *part* of an extended individual – the species olive tree – or that she sees the tree as a *member* in the set of olive trees, or as being possessed of all those homeostatic *properties* commonly instantiated and encountered together, in olive trees (Boyd 1999, p. 162)? In agreement with section 1.2, I will be treating visual representation of properties that typify their objects in terms of visually recognizing the objects thus typified.

As Rudder Baker (2004, p. 102) notices, one never *sees* an object as a *blob*, but rather as an object. If Judy recognizes the olive tree, that counts as visual object recognition. The claim that kind properties are represented in the content of visual experience can then be supported by empirical evidence coming from clinical cases of *impaired* visual object *recognition*, i.e., associative visual agnosia.

Patients suffering from associative visual agnosia consciously see, but they are unable to recognize what they see. Seeing is deprived of meaningfulness, of the knowledge that usually accompanies it (hence the term “agnosia”, etymologically meaning ignorance).²

The passage from the phenomenology of normal visual experience to the cognitive neuropsychology of visual impairments like associative agnosia should give philosophers pause. How can clinical records and speculation about them – decidedly empirical issues – be brought to bear on distinctively philosophical topics like the content of conscious experience? The answer I provide in my thesis is a methodological one: I adopt Flanagan's (1992, pp. 11-20) natural method, according to which fields like the philosophy of perception, the philosophy of mind, the philosophy of psychology, cognitive psychology, clinical neuropsychology, etc. each tackle common issues from their various disciplinary vantage points. Such issues include: what is it to think a thought or to have a visual perceptual episode? Or what is it to be aware of what you see or think? Flanagan's natural method consists in drawing on insights from each of these separate fields of inquiry if they can shed light on one another and on the topic at hand: what is the content of conscious visual experience?

One could still be an adept of the continuity of philosophy with science (Quine 1969, p. 83), here cognitive science, and yet not endorse Humphreys and Riddoch's (1987, pp. 5-24) clinical method: the method of drawing lessons about normal function (in sensory or cognitive processes) from impairments observed in clinical cases. Gregory (1995), for example, has a telling analogy: if a radio transistor breaks, and replacing the transistor makes the noise go away, we should still be reluctant to say that a transistor has as its function to remove noise (it would be a mistake). In order to address this worry, the reality-

2 Visual agnosia is underwritten by a variety of neural damage (brain infarction, Alzheimer's disease, encephalitic herpes) targeting mainly, but not only, the inferior temporal lobe. The quite varied pattern of neural damage is nonetheless highly selective itself, attesting to the necessity of some neural correlates of behavioral and phenomenological impairments. For most physicalists (Place 2004), the resulting bridge laws between neural damage and the behavioral-*cum*-phenomenological impairment will have an *a posteriori* necessity (Dumitru 2006), being formulated explicitly only after close scrutiny of the clinical cases, and perhaps after previously failed theoretical attempts.

check I use as a guide to looking for normal visual function is perceptual learning in healthy perceptual subjects. The guide is reliable because the overall phenomenology of both patients and normal perceptual subjects is known in its outlines, and comparing their respective phenomenologies can supply the data that neuropsychological hypotheses need to capture (Stephens and Graham 2000, pp. 7-13).

Drawing on the wide family of associative agnosias, Bayne (2011, §7) gives qualified support to explaining unimpaired recognition of natural kinds in terms of representing kind properties in the content of visual experience. On the one hand, Bayne correctly notices that it is not universally true that kind properties are represented in conscious vision, because agnosic patients do not represent them. On the other hand, since the condition of agnosics is atypical and morbid, *not only* do most perceiving subjects seem to behave as Siegel suggests (representing properties such as being a pine in the content of their visual experience of a pine), but this is the way things are supposed to be when the visual system is *functioning properly*.³

I entirely endorse Bayne's basic line of thought, with one qualification. It seems even better clinical evidence can be provided for the representation of kinds by narrowing the focus of agnosias. Some cases of associative visual agnosia are *selective* impairments. Clinical reports of selectively impaired patients support a double dissociation (Farah 2004, pp. 139-154): some of them recognize living things (plants and animals), but not things that are not living, while others recognize the latter but fail to recognize the former.⁴ Read contrapositively, as applied to normal perceptual subjects rather than patients, these clinical cases could turn out to be the central piece of evidence - the clearest, and the most relevant - supporting Siegel's claim that the content of conscious vision represents kind properties

3 As a compromise, it should be said that the patient-relativity of the content of agnosic experience makes us take claims about most patients or about patient-invariant normality with a pinch of salt: not to say they may not be true, but to pay close attention to the differences between case reports.

4 For two especially clear cases, cf. Hillis and Caramazza 1991; for an overview of all cases - between 1984 and 2001 - of selective impairments in the recognition of living things and, respectively, of artifacts, cf. Capitani et al. 2003

when instances of natural kinds are seen.

Siegel's method of phenomenal contrast is also illustrated by selective impairments. Only here the phenomenal contrast is not due to perceptual learning, and does not accrue slowly. The contrast is due to brain damage, and it is abrupt. Patients are well aware of the superiority healthy adults have over them. What comes natural for a healthy adult requires considerable effort and concentration from an agnostic patient, and frequently with less impressive results. Patients feel they have to *cope* with having lost abilities they once enjoyed. Patients also often feel *stigmatized* by their medical condition, that they are no longer what they used to be - physically, mentally, socially (Humphreys and Riddoch 1987, pp. 109-114). These patients exhibit a marked phenomenal contrast between their pre-traumatic condition and their post-traumatic condition.⁵

The selective impairment is clinically documented in the following way. *If* tested, a normal subject *would* visually recognize the plant or animal seen. *If* tested, a selectively impaired patient *would* fail to recognize them. These counterfactual conditionals need truthmakers (Heil 2005); such truthmakers could explain the dispositions normal subjects have, and patients lack, to recognize living things. But the dispositions themselves need to be individuated relative to the perceptual subjects having them, in terms of their underlying neural and functional structures subservient to them (Place 2004).

So, on the one hand, Bayne's argument from agnosia and my variant from selective impairments in recognition both provide the requisite support for Siegel's claim that kind properties are represented in the content of conscious visual experience (if it is understood as in Part 1). On the other hand, the presence or lack of such recognitional invites cognitive theorizing into what gives rise to them, and

5 Sometimes, but only sometimes, there is also a *second* phenomenal contrast, entirely post-traumatic, delivered by gradual partial recovery of lost recognitional abilities following neural reorganization triggered by extensive practice (e.g., patient Y observed by Hillis and Caramazza (1991) improved considerably in the interval of 7 to 13 months following her brain infarction).

whether we can distinguish purely sensory visual processing from higher-order cognitive processing in conscious visual experience. Such is the topic of Part 3.

3 SEEING, BELIEVING, AND VISUAL RECOGNITION OF LIVING THINGS

In Part 2, I have presented two arguments brought in favor of the claim that kind properties are represented in the content of conscious visual experience. The claim itself, and the arguments for it, were predicated on the assumption that experience is understood broadly enough as to include both sensory aspects and cognitive aspects (pertaining to belief-forming) of the conscious unified experiential episode.

Such a wide understanding of experience is not standard, and a question arises as to whether the kind properties represented in the content of visual experience when familiar living things are recognized are closer to sensory processing or closer to cognitive processing. The question trades on the traditional distinction between seeing and believing. Is the distinction tenable in the case of visual object recognition? In this final part of the thesis, I try to undermine the idea that we can draw a clear-cut distinction between seeing and believing in the case of recognizing seen objects.

The inquiry will draw on the neuropsychological literature that has theorized associative visual agnosias and their selective variants, in which patients have impaired recognition only of objects belonging to some categories (especially impaired recognition of living things). My attempt to question the seeing/believing distinction and to suggest that, in object recognition, seeing and believing cannot be clearly distinguished, is conditional upon two assumptions: that the neuropsychological literature should be taken at face-value in the very few assumptions on which it reaches consensus (section 3.2), and that those assumptions should, when intuitive (section 3.1), and absent compelling evidence or arguments to the contrary (section 3.3), be at least provisionally considered true.

3.1 *Recognizing seen objects: the role of semantic memory in visual perception*

In this section, I will probe commonsensical intuitions and suggest that they militate for accepting there is a constitutive role semantic memory plays in visual experience when the seen objects are recognized. This intuitive just-so story will be supported in the sections to follow by clinical findings about visual agnosia and category deficits, taken in their standard interpretations in the literature.

To begin with an example, suppose Jack is walking in the park among willow-trees. Since Jack gained the skill to recognize willow-trees long ago, each such tree no longer gives Jack the first encounter with willow-trees. It is plausible for Jack to have stored previous presentations of willow-trees in *long-term memory*, forming a mnemonic *representation* focused on a cluster of homeostatic properties (statistically co-occurrent, and mechanistically related to one another, cf. Boyd 1999, p. 142).

As Jack is walking by once such willow-tree, he *re-present* and *re-cognize* it. Jack could voice his familiarity with willow-trees by saying “This is the same as that,” (Rosch 1973/1999, p. 190 ff.), drawing on the similarity between different willow exemplars, “this” referring to a tree represented in Jack's current visual field, and “that” referring to previously seen trees. Moreover, Jack's willow-representation (or willow-concept) is *semantic*, hence stored in semantic memory, as recognition is stable across so many past perceptual episodes.⁶

So in conscious visual *perception*, semantic *mnemonic* resources (semantic representations stored in long-term memory, i.e., concepts) are being necessarily deployed. Were they not deployed, *visual* recognition would not occur. It is not that Jack would be having two separate conscious

6 Recognition is an ability, so it has to be stable across several perceptual episodes. Jack has to identify willow-trees reliably (with great accuracy) and robustly (with little sensitivity to occasional misidentifications) (Kosslyn and Koenig 1995). If Jack's recognition starts by being triggered by his episodic memory (he thought this was a willow because this is the same as that, and he remembers that was a willow), and if his recognition is reliable and robust, he will soon develop a stable mental representation activated only when seeing willow-trees. This generality across perceptual circumstances is constitutive of a semantic representation, a representation stored in semantic memory. So recognition involves activation of a representation in *semantic memory*.

experiences: seeing and remembering. If the content of his experience is tensed, it set to the present tense: it is what he currently sees and recognizes (Audi 1998, pp. 2-5). He does not *also* consciously remember anything. Rather, his long-term memory is functionally involved in what he phenomenally experiences as the seen content.⁷

Readers who find the example above intuitive share my overall outlook. But this outlook runs against a deep-seated philosophical *presupposition* that is to some degree also commonsensical. This is the presupposition that there is a clear distinction between visual sensory processing brought to consciousness (seeing) and its semantic interpretation (categorization, or concept-application). On this widespread view, semantic interpretation is a stage separable from the initial sensory mechanism, and that comes only later to consciousness in understanding what one will have antecedently seen.

Traditionally, the seeing/believing opposition was conceived of in roughly the following way. One sees with one's eyes, seeing is one sense among many, and the experiencer need not (and often does not, e.g., infants and non-human primates) any concepts. Vision delivers sensations that can at most, if contentful, represent low-level properties like being red or being round. Phenomenal content is thus often restricted to what Siegel (2010, p.99 ff.) calls low-level properties. Beliefs, on the other hand, are mental states contentful of the world being thought about, they are strongly intentional, conceptually structured and independent of the deliverances of any single sensory modality. The content of vision is nonconceptual, the content of belief is conceptual (Crane 1992). Vision is one modality, belief is modally-unspecific. Visual processing is anatomically located in the striate and extra striate cortex, but beliefs are

7 Unimpaired vision is the more frequent case, but the example above does not depend on it. Recall the complex visual hallucination example in section 1.1 (Rocha et al. 2012): seeing small pumpkins break out of one's skin is physically impossible (subcutaneous strata are hardly fit for growing pumpkin). But the hallucinating patient sees pumpkin break out of one's skin, not raspberries. In introspectively describing her experiences as she does, the patient appeals to a *concept* she possesses (of pumpkin) to capture the content of her visual *experience*. My point about the content of experience concerns only the application of concepts in conscious visual experience, not the acquisition of concepts on the basis of experience. Why or how that occurs is a fascinating question related to perceptual learning, but it is different from the question of how concepts are deployed in visual object recognition.

neurally distributed across the cortex. Unlike vision, it is extremely difficult to pinpoint any more specific neural correlates of believing – beliefs are “nonentities” (Rudder Baker 1994).

There are many alleged differences between seeing and believing that the partisans of distinguishing them capitalize on. To these differences, I will oppose the intuitive case of visual object recognition sketched above. Intuition is not the only support I provide. The seeing/believing distinction, while central to some philosophical traditions mentioned below, is entirely bypassed by the neuropsychological literature on category-deficits and associative visual agnosias. If we are to take what cognitive neuropsychologists say at face-value, I suggest we should refrain from drawing a hard and fast distinction between seeing and believing. Invoking this kind of empirical evidence is the topic of the next section.

3.2 *Object recognition and nonconceptual content*

Perhaps the relatively recent theoretical development in the philosophy of mind that most explicitly relies on a distinction between seeing and believing is the claim that the content of perceptual experience is nonconceptual. In this section, I will provide a set of considerations suggesting that nonconceptual content does not exhaust the relevant content of visual experience in the case of visual object recognition. In recognition, content is always at least partly conceptual.

The notion of nonconceptual visual content has received a number of defenses from its notable proponents (Dretske 1969 pp. 18-35; Peacocke 1992, pp. 105-110). It is far beyond the scope of this paper to argue that conscious visual experience does not incorporate fine-grained nonconceptual content. Two qualifications are in order. First, I am here concerned only with the case of visual object recognition, which may plausibly be construed as categorization, i.e., concept-application. Second, in object recognition, saying content is only conceptual and saying content is only nonconceptual are not the only options.

As Kelly (2001, p.606 ff.) points out, a third alternative is to say that the contextual richness of experiential content in no way prevents the application of concepts in experience, while leaving room for fringes of nonconceptual content (what Lycan (1996) calls “strange qualia”). There are, of course, also philosophers for whom seeing is believing, for whom the content of visual experience is conceptual throughout (Heil 1982, p.230). In what follows, I will be arguing for a position that is undecided as between Kelly's moderate stance and Heil's more thoroughgoing stance.

In a previous section, I have suggested perceptual subjects are unable, when they introspect on their experiences, to factor out cognitive and sensory aspects of their phenomenology. If that claim is true, then it is open to the seeing/believing proponent to argue there is a functional distinction to be made at the systems-level between seeing and believing. The next two paragraphs will suggest the contrary.

Here is a first possible consideration against a nonconceptual-only content of visual experience. Impairments of visual object recognition fall under the purview of visual associative agnosias. When the impairment is selective, it is called a category deficit. From the very beginning, attempts to theorize category deficits (Warrington and Shallice 1984, Farah and McClelland 1991), have sought to explain impairments in recognition by proposing models for how unimpaired recognition works, thus validating the clinical strategy sketched in section 2.3.

Another structural element of almost all models of category deficits was the appeal to how semantic memory works in visual object recognition. Semantic memory, as conceived by these researchers, is that part of long-term memory that stores concepts. The default assumption underlying research on category-deficits was that concepts are deployed in object recognition.

Behaviorally, the vast majority of category deficits involve visual impairment of recognition. Patients are unable to recall what the relevant objects are when they are given names or pictures equally. Warrington and Shallice (1984, p. 829), in their groundbreaking study of category deficits, then

frame the question as a lookout for a deficit that is both category-specific and modality-specific. The category specificity comes from impaired recognition of living things and unimpaired recognition of artifacts, or conversely. The modality specificity to vision does *not* amount to saying that the impairment is exclusively visual and not cognitive. What modality specificity does require is that, among the *sensory* modalities, vision is impaired while touching, hearing, etc. are not. The question framed by Warrington and Shallice is one to which later researchers have improved upon, but always taken as their starting point. If this assumption quasi-unanimously made in the neuropsychological literature is taken at face-value and as best supported by the data available to researchers (an epistemically modest attitude many philosophers of science would not demur from), then there is a unified deficit in object recognition that is *both semantic and visual*. This strongly undermines philosophical conceptions that exclude concepts from visual object recognition.

3.3 Form agnosia, alexia, and category deficits

Excluding a philosophical view on the apparently arbitrary reason that some scientists disagree with it is certainly not an approach I condone. This is why this section will not only provide another consideration against the exclusive nonconceptuality of visual content in object recognition, but will also seek to partially explain why some philosophers (e.g., Siegel 2010, pp. 207-210) may be attracted to the nonconceptual position.

A perhaps too simple view about associative visual agnosia (of necessity presupposed by nonconceptual theorists) is the following. In general associative agnosia, seeing is unimpaired, while the conceptual apparatus underlying forming beliefs about what one sees is severely damaged. The view would have it that recognition fails because concepts are damaged or inaccessible to visual-processing. The simple view is implicit in the name “agnosia”, etymologically meaning ignorance. Patients would see impeccably but fail to understand, hence believe, what they see. I will suggest in this section that the

simple view is mistaken. To appreciate that, we could attend to the fine yet undeniable differences between form agnosia, semantic impairments, and alexia.

Individual patients are seldom clean realizations of theoretical science,⁸ and critics of theoretical posits – selective semantic deficits - have capitalized on individual variations (Humphreys and Forde 2001, pp. 454-457). The problem is that many of the existing tests for object recognition that lead to a diagnosis for selective agnosics involve (1) pairing photos with what is photographed, (2) pairing words (names, definitions, or descriptions) with photos, (3) pairing names with definitions and descriptions, (4) pairing names with actual samples of what is named, etc. So, roughly speaking, tests play on matching words to pictures, and to what is described or named by words, and what is pictured (Farah 2004, pp. 1-10).

If not all tests are done on a specific patient (and such methodological slips were frequent in the early literature on the subject, cf. Caramazza 1991), then it is difficult to separate form agnosia, selective semantic impairments, and alexia. Form agnosia is an impairment in recognizing the forms of objects, which prevents the patient from visually recognizing the object even when the patient is in possession of the relevant concept. Selective impairments are typically accompanied by loss of associated concepts. Alexia involves losing the names and structural descriptions for objects that can still be visually recognized. Whether concepts are lost in alexia, or whether alexia is a deficit in semantic access, rather than semantic loss, is an open question.

8 Some patients are selectively impaired in their knowledge of only fruits and vegetables, remaining comparatively better able to recognize animals. Others are selectively impaired for knowledge of animals but not for plants, or for plants but not for animals. Yet others are impaired in their knowledge of plants, animals, and musical instruments, or foods, or textures and fabrics, or means of transportation, or precious stones and gemstones. It is very difficult to find pure cases of selective impairment for knowledge of both plants and animals, and of nothing else (Capitani et al. 2003). Nonetheless, there is a clear convergence of data which warrant hypothesizing a single impairment accounting for most such cases. In seeking an impersonal, unified account of the impairment, we should not lose sight of the particularity of each patient, and how they subjectively respond to their medical condition (Chung, Fulford & Graham 2007), without thereby falling into the trap of explaining away a selective category-deficit in terms of patients' premorbid differences in expertise with objects in that category (for discussion, cf. Humphreys and Forde 2001).

Why look into the differences between form agnosia, category deficits, and alexia? One important reason is the fact that we gain a middle ground for what is specifically semantic as opposed to earlier visual processing (of pixel-intensity, lines and blobs, contours, shape, orientation, then form) and also as opposed to later linguistic processing (words that try to capture meanings, but with a limited expressive power). An autonomous domain of semantic processing intercalated between form processing and lexical processing, a *semantic* domain used in *visually* recognizing objects, does justice to the intuition in section 3.1 that mnemonic semantic resources underlie the conscious visual experience of recognizing objects.

The middle ground has elicited conflicting responses from nonconceptual theorists. Early-generation nonconceptualists (Fodor 1998, pp. 23-39) model concepts closely after words. The unpleasant consequence that concepts are a bit like abstract words in being disembodied from the language the words belong to, but they are just as removed from sensory information. This consequence is dispelled if concepts (semantic structures stored in long-term memory) are seen to be, metaphorically speaking, at an equal distance from visual and from lexical processing, influencing both and perhaps influenced by both to varying degrees. I am not proposing this metaphor as the truth, but as a metaphor important for the contrasting presupposition it reveals: modeling concepts too closely after words (Millikan 2011, pp. 132-133).

New-generation nonconceptual theorists like Siegel (2010, pp. 30-33) inherit the linguistic approach to meaningfulness (concept-possession ascribed externally according to, minimally, satisfaction of accuracy conditions). But they nonetheless suspect that there are genuine semantic resources deployed in vision that are much more autonomous from language. Perhaps this is why Siegel speaks of the representation of high-level properties in the content of experience itself. Meaningful seeing is then sometimes coupled, as by Siegel (2010, pp. 207-210), with working through the thesis of the modularity of vision. Semantics, on such a view, is torn between a purely visual semantics, what Siegel (2010, p.208)

calls “the commitments of experience”, and a purely lexical semantics organized in concepts, the deployment of which is proof of the cognitive penetration of the higher-level and less modular visual processes.

Opposed to both generations of nonconceptual theorists, the distinctions between form agnosia, category deficits, and alexia suggest a rethinking of semantic memory as influenced by and influencing both verbal and visual processing. *Concepts* could then be understood ecumenically as associations stored in neural networks, associations that are robust and stable enough as to serve the purposes of long-term memory in a less context-sensitive way.

If the foregoing story is at least partly correct, then we have the beginnings of an explanation of what went wrong in the conception of semantics used by nonconceptual theorists that find the conclusion of section 3.1 (that visual object recognition is *both* seeing and believing) paradoxical. The substantive task of extending the beginnings of such an explanation to the modularity/cognitive penetration debate is beyond the scope of this thesis.

Having pointed out that there is an important role for semantic memory to play in vision, and that the neuropsychological literature does justice to everyday intuitions about visual object recognition while undermining some recent theorizing about seeing vs. believing, the natural step is to ask just *what* role semantic memory is supposed to play (according to neuropsychologists) in consciously recognizing seen objects. The next section is devoted to framing this question in a way that bears on the distinction between seeing and believing.

3.4 Use of semantic memory in visual experience

How to explain the use of semantic representations in visual object recognition? Neuropsychological research into category-deficits has been divided into two families of approaches.⁹ At one end of the spectrum is the traditional proposal to split the recognitional process into two: one stage that outputs a modally-specific but categorially-unspecific representation, the sensory representation, which is then matched in a second stage of recognition to an output representation that belongs to an “amodal hub” (Lambon Ralph and Patterson 2008, pp. 62-65) that is conceptual, i.e., categorially-specific. This view borrows from a rich philosophical tradition of separating seeing from believing, or phenomenal content from epistemic content (Chalmers 2006, p. 71 ff.), reverberating in contemporary views of the functional underpinnings of vision (viz., the debate about whether filling-in is something the brain does or overlooks, cf. Dennett 1996, pp. 165-168).

At the other end of the spectrum is concept empiricism. In the initial proposal of Warrington and Shallice (1984, p. 829), semantic representations can be both category-specific and modality-specific. On this view, there is no amodal conceptual space, but only modally-specific semantic stores akin to what Siegel (2010, p. 208) calls the “commitments of experience”. Whatever we memorize, we do on the basis of experience. The view (e.g., Weiskrantz 2008, p. 326) dispenses with assuming the existence of a distinct amodal conceptual space, and replaces it with a convergence of sensory information that triggers top-down retroactivation of sensory cortices. Recent neuropsychological elaboration (Gainotti 2011, pp. 304-305) conjectures there is hemispheric specialization of higher-order convergence zones, with a left zone devoted to verbal semantics more, while a right one would be primarily devoted to

9 As Weiskrantz (2008) points out, there may be multiple memory systems in the brain, where representations of stimuli may be temporally coded (Kosslyn and Koenig 1995). If so, the role of the hippocampus might be to send a feedback loop (Lamme 2003), a typically conscious one (i.e., how recognition might occur), that might serve in vector-completion, or in stabilization into attractor-states. On a process-view of visual qualia (Place 2004, Manzotti 2008), conscious experience could be seen to arise from the *interaction* occasioned by feedback loops among long-term memory structures and the striate and extrastriate cortex.

visual semantics.

It is an open, empirical question, which one of these outlooks on semantics may eventually turn out to be more fruitful in cognitive neuroscience. Simulation with neural networks has been performed with both two-tier (mimicking perception-plus-thought, e.g. Rogers and McClelland 2008, p. 692) and one-tier (modally-specific semantics, e.g., Farah and McClelland 1991, p. 343) networks. For both kinds, it is highly unlikely that computations made on them carry over to semantic cognition in real brains (Winsberg 2011, p. 39). For both kinds, imagistic studies are available (Vandenberghe 1996) but cannot favor one hypothesis over the other. Nor does the apparently impressive anatomical distinction between sensory and higher cortical areas seem especially compelling.¹⁰

I am not discussing these two views in order to reach a final verdict as to which of them is right in how object-representation works, and how much of it is visually-specific or not (Treisman 1998), projects far beyond what is contemplated here. The reason for contrasting the two views is that they make different assumptions about how, if at all, seeing should be distinguished from believing what is seen. For Warrington and Shallice (1984), there would be little point to trenchantly distinguish seeing and believing what is seen if the concepts going into the belief are themselves empirically formed, maintained, and changed. But a partisan of the two-tier view will welcome the prospects of distinguishing seeing from believing, or sensory representations from the amodal conceptual structures

¹⁰ In spite of the inseparability of visual and cognitive factors in both unimpaired and agnostic phenomenology (apparently speaking for the one-tier view), there is an undeniable anatomical distinction between lower areas of sensory information-processing and higher areas of semantic interpretation of sensory inputs (apparently speaking for the two-tier view). On both views, sensory information is processed in a cascade of increasingly complex models in the ventral pathway of the visual cortex areas V1-V5 (Mishkin et al. 1983, Lycan 1996, Humphreys and Forde 2001), culminating in meaning-assignment to sensory representations pending activity in the hippocampus, in the temporal lobe, where the ventral pathway coming from the occipital lobe is entrant (Kosslyn and Koenig 1995). But such crude localizations should not obscure the fact that, in passing from one model of the visual scene to another model of increased complexity and finesse of discrimination, the computations performed are largely unknown. Speculations exist about them, but are insufficiently corroborated. There is no proof that an anatomical distinction between sensory areas and higher cortical areas carries over at the computational level, which would be needed (but does not obtain) if one were to draw a clear seeing/believing distinction at the functional-systems level.

they are matched with in object recognition. When one's model of recognition is to match one tier (sensory) to the other (conceptual), one needs to be able to clearly distinguish the two tiers in the first place.

As Dennett (1996, p. 162) aptly remarks, neither of the two extremes on semantic memory is desirable. On the one hand, there are many beliefs we entertain that do not bear directly on visual experience: general beliefs made available in thought for inference. And there do seem to be visual experiences of which their experiencers cannot make sense. On the other hand, researchers cannot elude the central phenomenon of visually recognizing objects: we come to believe, in the very same breath as seeing, that what we see are objects of a familiar kind that we recognize. In recognition, we then form a belief about the object and its appropriate category, a belief formed *in*, and because of, the visual experience had. Let us call such beliefs visual beliefs. Visual beliefs would then be episodic, dependent upon what happens to be perceived, but they would involve a context-dependent deployment of concepts (Kelly 2001, p. 606) that makes recognition of the seen objects possible.

The existence of visual experiences-beliefs (in a sense, sensory-cognitive facets of the same coin) in object recognition *questions* the existence of a boundary in information-processing at which seeing ends and believing begins, at which sensory processing gives way to cognitive processing. I say “questions” because the one-tier model flatly denies the existence of such a boundary, whereas the two-tier model presupposes the existence of such a boundary. Since which of these two models is correct is an open empirical question, we as yet have no conclusive grounds to believe either that seeing definitely is, or that seeing definitely is not, believing.

A natural objection to the foregoing line of thought is to remind ourselves of the cases of infant and animal cognition. After all, the objector could suggest, surely infants and higher mammals do not possess a conceptual system as rich and structured as that of adults. Perhaps infants and higher mammals see without believing (Dretske 1969, p. 10). I believe the objection is rather weak.

First, notice that I am only questioning where to draw the sensory/cognitive distinction. Saying that such a distinction is not straightforwardly applicable in the case of infants and higher mammals is beside the point. The point is about the central case, what happens in visual object recognition in normal adult human beings. Dretske himself (1969, pp. 28-29) admits that it is infrequent and “extraordinary” for visual experience to occur without concomitant beliefs, beliefs which he agrees are not always (and perhaps rarely) phenomenally distinguishable from the experience of recognition.

Second, the issue of whether infants and higher mammals have concepts is far from foreclosed (Graham 1993, pp.62-64). Conceptual development has to start from somewhere, and the variety of cognitive profiles that may also be species- and age-specific only attests to the fact that “concept” and “belief” are not themselves psychological natural kinds, but admit of variation and heterogeneity. Notice, in passing, that the objection has to assume a restricted understanding of what a concept is, explicitly denying the ecumenical construal of concepts sketched in section 3.3 and at play in developmental and comparative approaches.

This section has suggested visual object recognition involves semantic processing the construal of which questions the seeing/believing distinction at a functional level (the relation between the visual input and its being processed and made available for cognition). Section 2.2 above has made a similar case: that perceptual subjects cannot, in introspecting on what it is like for them to see and recognize the objects seen, distinguish the sensory and the cognitive aspects of their phenomenology. How do these two negative claims relate to one another? What is the relation between our inability to distinguish seeing from believing in phenomenology and the semantic processing of the visual stimulus at the subpersonal level? The next section approaches this question, and dramatizes the case against a seeing/believing distinction by questioning the role of visual awareness in information-processing.

3.5 ***Blindsight: the indispensability of visual awareness for having a content of experience***

Seeing and believing are typically predicated not of any neural information-processing, but only of conscious visual experiences. Section 3.4 asked whether a seeing/believing-what-is-seen distinction can be drawn. Now I wish to point to an aggravating factor: only quite little of visual information-processing reaches consciousness, and it is not clear, computationally, what the role of visual consciousness might be in distinguishing some visual stimuli as opposed to others (Lamme 2003). If so, the seeing/believing distinction has no chances at a clear resolution before the role of visual awareness is more carefully scrutinized. To that effect, it may serve to take a quick look at whether, and why, conscious experience might not arise in cases of blindsight.

In blindsight, damage to the striate cortex in the occipital lobe causes a scotoma, a portion of the visual field in which the patient is consciously blind. Neural damage and absence of visual awareness covary,¹¹ providing evidence for the physicalist claim that conscious experience *depends on* the underlying neural circuitry (Place 2004). Whatever goes on in conscious experience supervenes on physical differences.¹² Normal visual conscious experience, in its turn, seems highly correlated with (and *perhaps* responsible for) the rich and flexible behavioral repertoire that blindsight patients lack.¹³

Unlike blindsight, properly functioning visual object recognition always involves visual

11 For example, in patient DW (Weiskrantz 1986), *partial* surgical removal of the striate cortex was accompanied by loss of conscious vision, but the patient still exhibited *some* phenomenology.

12 In itself, this is quite a weak claim. Minimally, the supervenience intended here is global, allowing for as widely distributed information-processes as are compatible with current cognitive-scientific theorizing. Moreover, as Horgan (1993/2002) correctly insists, supervenience itself is a logical property of a relation, and saying that, e.g., that the relation between consciousness and neural processing is one of supervenience only gives a characterization of that relation in terms of possible-worlds semantics, a characterization that could turn out to not be as illuminating as initially hoped.

13 One initially plausible, but ultimately indefensible lesson is that, in blindsight, testing performance (behavior) and visual awareness (phenomenology) come apart. But, at a deeper analysis, the opposite lesson is equally warranted: when blindsight patients are neurally sensitive to some features of stimuli (location, movement), they respond through a limited set of behaviors, highly contrastive of the rich behavioral repertoire mastered by subjects visually aware of the objects of their sight (Lahav 1993). If the focus is rather on the flexibility, variety, and context-sensitivity of behavioral responses, rather than merely exhibiting some behavioral response at all, then it would seem that visual awareness is very much a guide of behavior.

awareness. What might ascribing awareness to vision *mean*? Awareness is not wakefulness, or some general state of arousal, as blindsight patients are just as awake as normal subjects, having comparable physiological responses to testing conditions (Lau 2008). Nor is visual awareness *of* stimuli the general consciousness *that* something is going on. Blindsight patients are fully aware *that* they are being tested, and *that* a stimulus may be presented to them, and they are painfully aware *that* they cannot consciously see the stimulus. What they are not aware *of* is the object itself, together with (intentionally directed) facts *about* the object displayed in their blind hemifield. But this does not mean that blindsight is any semantic impairment, for cases of partial blindsight (like patient DW studied by Weiskrantz 1986) document the intactness of semantic memory. Visual awareness has to be something considerably more specific.

Theorizing cases of blindsight, Weiskrantz (1986, 2008) remarks that the prime evidence we have of a person's conscious experiences is that person's running commentary of what she experiences, her reports of the experiences she is undergoing. Blindsight cases point to two facets of the commentary key: the linguistic aspect (reports of conscious experiences are but reports) and the cognitive accessibility aspect (in order to report an experience, the subject has to have cognitive access to it). These two aspects have been developed by Ned Block (1996/2002), who distinguished two concepts of consciousness, one of phenomenal consciousness (what it is like to undergo an experience) and one of consciousness as cognitive accessibility. Block's (2007) discussion of whether there can be phenomenal character without cognitive accessibility is nuanced and thoroughly empirical. The phenomenal character/cognitive accessibility distinction shares many features in common with the seeing/believing distinction sketched in Part 3. As section 2.3 suggested, I agree with Block (2007, p. 491) that the attempt to flesh out the distinction (in either formulation) should be empirically informed, but section 3.4 made the case that, if there is any visual phenomenal experience independent of our cognitive access to it, that experience cannot be one that involves visual recognition of objects.

The notion of cognitive access is itself not univocal, and Block (2007, p. 484) questions Weiskrantz' running commentary strategy by suggesting reportability is dispensable for cognitive accessibility. Put somewhat differently, one could form beliefs about what one experiences without putting those beliefs into words – a moral that is remarkably similar to the metaphor sketched in section 3.3 about semantic processing being equal distanced from verbal and from sensory processing. However, in light of 3.2-3.4, the notion of accessibility needs positive characterizations that do not beg the question in favor of drawing a seeing/believing distinction.

One such possibility is to understand accessibility in terms of attention. As Block (2007, p. 484) remarks, one could access the experiences one *notices*, and *thereafter pays attention to*. Interpreting accessibility as directed attention is corroborated by studies carried out on blindsight patients by Kentridge, Heywood and Weiskrantz (2004), who speculate that patients can attend to the visual stimuli in spite of having no conscious experience of them. For the rest of the section, I will focus on the interplay between attention and conscious visual experience, leaving it open that cognitive accessibility may be given a variety of other interpretations. The focus on attention is driven by its intuitiveness, the rich empirical support which can be brought to bear, and its close connections to notions such as working and long-term memory (cf. section 3.1), all reasons Block (2007, pp. 490-491) shares. Focusing on attention allows for a reformulation of Block's initial distinction as one between paying attention and the experience undergone by the subject.

In a synopsis of his earlier work on attention, Baddeley (1993) analyzed attention into *awareness* (phenomenal character), *selection* of the stimuli that surface to awareness out of the multitude of stimuli available, and *control*, i.e., maintaining attention (eye fixation, eye movement, body movement in object-tracking). On his view, directing attention presupposes the existence of an experienced content that is attended to, contrary to Kentridge et al. (2004). So a consensus on the relation between experience and attention has not emerged. Discussing the attention/phenomenal character distinction is

further complicated by the fact, pointed out by Treisman (1998), that it is hasty to talk of attention as if it were a unitary phenomenon. A more cautious alternative is to identify different attentional systems, some of which may be accompanied by reportable phenomenal character (the ventral pathway typically active in object recognition), while others not (in the dorsal pathway, and via the pulvinar) (Place 2004, pp. 113-137). The theoretical distinction between object-attention and phenomenal character might in practice turn out to be a distinction without a difference.

So is “visual awareness” a fundamentally ambiguous term, designating either attention or phenomenal character? Following Flanagan (1992), I disagree. Flanagan (1992, pp. 62-66) distinguishes between the neural information available and what goes into the introspectively accessible content of experience. At the neural level, damage to the striate cortex makes both the ventral and the dorsal pathway of the ventral stream not be able to access the inputs from the retina via the lateral geniculate nucleus. As the ventral pathway is the sensory cortex dedicated to object recognition, there is no (reportable) conscious experience of *what* the object in the blind visual field is. As the dorsal pathway is the sensory cortex dedicated to place recognition, assigning locations to objects, there is no (reportable) conscious experience of *where* the object is (Mishkin et al. 1983, pp. 414-415). However, polysensory areas (so visually unspecific) in the midbrain, such as the superior colliculus and pulvinar, are not affected by the damage to the striate cortex, and still intake retinal information. These areas are inaccessible to (reportable) consciousness – Place (2004, p. 121 ff.) plastically dubs them “the zombie within”¹⁴ - and they output neural signals into the posterior parietal cortex, dedicated to place maps, which accounts for the high performance of blindsight patients in clinical tests checking for position of stimuli, movement of stimuli, or eye-hand coordination.

14 Does this show not only the conceivability, but the well-nigh existence of zombies? Certainly not. The midbrain is not a homunculus, it is no agent, only an ensemble of structure subserving the rest of the cognitive system. As a physicalist, Place himself would find zombie arguments against his identity theory of mind and brain (Place 2004) quite uncongenial, and laments the gradual increase of the importance of thought-experiments over discussing the extant clinical evidence and neuroscientific alternatives.

The consequences for our earlier discussion of attention and phenomenal character are not univocal; two avenues seem open. One is to say, *pace* Baddeley (1993) and Lamme (2003), that attention need not presuppose phenomenal character, so the midbrain structures implement an attentional system for stimuli of which the patient is necessarily unaware. The second is to say, *pace* Kentridge, Heywood and Weiskrantz (2004), that the neural sensitivity of the midbrain is not attentional, since it does not deliver reportable phenomenal character. A pluralistic answer is a third open avenue, trading on the multiplicity of attentional systems. This essay cannot even begin to resolve what “attention” means. But on all alternatives sketched here, “visual consciousness” equates “having visual phenomenal character.” This is also in agreement with introspective naïve reports – one *can* have a visual experience while being inattentive (this does not entail one always does), but one cannot attend to what one is not experiencing (Davies 1998). Processing in both the dorsal pathway and in the midbrain is (almost) always deprived of visual consciousness (Place 2004). So neural selective response outstrips any conscious reportable experience, hence any contentful experience too (Flanagan 1992).

In this section, I have appealed to blindsight to provide a further clarification (beyond section 1.1) about what the conscious character of visual experience might consist in. In doing so, I have suggested that specific neural structures are necessarily subservient to visual conscious experience, but that not any neural sensitivity to visual stimuli is constitutive of the phenomenal content of visual experience. Content can be experienced only when conscious reportable experience occurs. How the content of visual experience is singled out among the available visual information is *an open empirical question*. But in order for the opposition between “believing” and “seeing” to have a grounding in neural circuitry, answering this question is a *prerequisite* for answering whether there is any distinction in content between a conceptually pristine visual experience and the content of a visual belief formed on the basis of experience.

CONCLUSION

Let me bring together the threads of this essay. The starting debate is whether kind properties are represented in the content of conscious visual experience. In order to answer the question, certain key terms have first to be clarified: how the content of visual experience is understood, and what it might mean to represent “natural kinds” (in the developmental psychologists’ sense) in it. Part 1 is devoted to this task.

Having clarified the question, Part 2 answers it and provides two related arguments in favor of the claim that kind properties are represented in the content of conscious visual experience, or that objects belonging to such kinds (familiar plants and animals) are recognized when seen. The first argument (Siegel 2006, 2007) appeals to the introspection of perceptual learners, who will have *acquired* the ability to recognize living things. The second argument appeals to both introspection and hypothesized neural mechanisms underlying *impaired* visual object recognition. Throughout Part 3, I used intuitive examples of perceptual learning and theorizing in cognitive psychology, and suggested that their results converge to support my claim.

The claim I put forth in Part 1 is that kind properties are represented in the content of conscious visual experience, but “experience” was conceived of *lato sensu* as the unified conscious stream that includes both seeing and understanding what one sees. The inability to phenomenally (section 2.2) factor out seeing and believing in the case of visually recognized objects that are seen and believed to belong to certain categories or concepts (section 3.1) is doubled by the open question of which model of semantic-processing in visual object recognition is the right one: a model which assumes sensory processing is clearly separable from its semantic interpretation, or a concept-empiricist model on which sensory and semantic processing are not two different stages of seeing (section 3.3).

Does visual object recognition show seeing is *the same as* believing? No. Does it disprove there

is *no sharp* seeing/believing distinction, since a crucial phenomenon in visual processing is also a crucial phenomenon in semantic processing? Yes. Where to go from this pessimistic conclusion for traditional (nonconceptual, cf.section 3.2) ways of conceiving the content of experience?

The conclusion is conditional on the phenomena briefly surveyed, especially selective semantic impairments and blindsight cases. Other pathologies (e.g., blind patients delusional that they see)¹⁵ could *perhaps* afford a more articulate seeing/believing distinction, but the main point of this paper is that more empirical work needs to be done, with more careful conceptual interpretation of the results. This does nothing to affect folk psychology, or the commonsensical origins of introspecting the phenomenal character of one's visual experiences and beliefs. All experiencing subjects may continue to describe their experiences in terms of what they incredulously see, or what they blindly believe. But as terms of art in the philosophy of mind, "seeing" and "believing" can be used more carefully. Biting the bullet, if *no* clear-cut seeing/believing distinction will turn out to be tenable, then these terms may perhaps give way to a more neural, but partly mongrel notion, of *meaningful experience*, a notion that could enjoy the support nonconceptual seeing and amodal believing had previously enjoyed without being beset by some of their major difficulties.

15 I actually doubt that blind patients who merely believe that they see are a good example for drawing a seeing/believing distinction. This is because the distinction investigated here was that between visual experience and the visual beliefs *it* gives rise to, whereas in the case of blind patients who merely believe that they see, both visual experience, and distinctively visually-formed beliefs are absent, leaving room only for a general, self-deceitful, belief. Moreover, such patients, while believing that they see, could nonetheless also additionally believe that they do not see, and, if so, the latter belief could more properly be said to have been formed visually, as the patients are, *ex hypothesi*, blind.

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