What Perky Did Not Show

Abstract: *Perky's famous experiments have been taken to show that at the limit perceiving and visualizing do not differ phenomenologically. One way to block this result is to argue that the task Perky set her subjects raised the threshold for perception, so that they did not perceive the stimuli shown. I argue that even if this strategy fails, Perky's results do not prove what many think. She showed her subjects, not the objects they went on to visualise, but crude pictures of such things. What they mistook for visualizing was thus, not perceptual consciousness of stimuli, but pictorial consciousness. Once we're clear about the nature of the latter, we can see that Perky's results reveal nothing very surprising at all.*

In 1910 Cheves West Perky published the results of a series of experiments on imagining and its relation to other mental states. One set of experiments in particular was to become famous. Perky and her collaborators asked subjects to fixate a point on on a surface while visualizing specified objects, such as a leaf, book, banana or tomato. Unknown to the subjects, the surface was a ground glass screen onto which images of those objects were projected from behind. The result was that subjects took themselves to be imagining as requested, though what they reported imagining reflected the patterns projected. For example, in response to a projection of a vertical yellow crescent, all the subjects reported imagining a banana that, to their surprise, was upright (Perky 1910: 432).

Perky was careful to check that the projected image was sufficiently bright to fall above the general threshold of perception for the relevant subjects. Thus she felt able to draw the following conclusion:

> ‘We find, in brief, that a visual perception of distinctly supraliminal value may, and under our conditions does, pass…for an image of imagination.’ (1910: 433)

That is, in these special conditions, subjects mistake their perception of something for imagining. A little more precisely, since they all along see the screen around the fixation point and take themselves to be doing so, they misconstrue their visual perception of the projected stimulus as visualizing, into the space they see around them, the specified object.

In the 1960s, Sydney Joelson Segal attempted to replicate Perky's results (Segal & Nathan 1964; Segal & Fusella 1969; Segal 1971, 1972). Her conclusions differed from Perky's in one important respect. Segal found that, while the projected stimulus would in other conditions be above perceptual threshold for the subjects, that threshold was raised by the task set. Being asked to visualize, e.g. a banana, while looking at the projected faint yellow pattern rendered the projected pattern inaccessible to conscious perception. The projection determined what the subjects visualized, but did so by being perceived subliminally.[1]

Segal's twist on Perky's results has been generally accepted in psychology. Indeed, the tendency of tasks in imagining or memory within a sensory modality to impair perception in that modality is sometimes termed the 'Perky effect' (e.g. Craver-Lemley and Reeves 1992). In philosophy, in contrast, there remains a tendency to adopt Perky's own conclusions rather uncritically. The following are typical:

> 'This experiment seems to show that imaging is, at least sometimes, experientially indistinguishable from seeing.' (Tye 1991: 14)

> 'This experiment…is taken to suggest that the phenomenal character of perception and that of visualization are very similar – if two phenomenal experiences are indistinguishable, they must be quite similar.' (Nanay 2010: p.252)

> 'Perky's experiment shows that, in some cases at least, perceiving feels *exactly* like imagining.' (Kind 2001: 94)

[1] Interpreting Segal's position is complicated by her preference for presenting her results in terms of Piaget's distinction between 'accommodation' and 'assimilation' (e.g. Segal 1971: 84-5, 89-94; Segal 1972). This choice of theoretical framework opens up delicate issues there is no space here to explore. That Segal nonetheless accepts the outlines of the view ascribed to her above (and in subsequent psychological literature) is clear: 'apparently a mental image, by itself could somehow raise the threshold or block perception of a stimulus' (1971: 81; cf. Segal & Nathan 1964: 385).

The thought is that indistinguishable experiences match, or at least very closely approximate, in phenomenology. Since Perky's subjects fail to distinguish perceiving from imagining, this is true of those two experiences in particular. At least some imaginings share phenomenology with at least some perceptions.

In moving from indistinguishability to phenomenology, these writers go beyond the conclusion from Perky cited above.[2] If Segal is right, however, Perky's experiments do not establish either claim. Since subjects' perception of the projected stimulus is merely subliminal, they have no visual experience of that stimulus. They do not mistake one conscious state for another, perceiving for imagining, because the only conscious state they are in is indeed imagining. And since only conscious states exhibit phenomenology, no conclusions can be drawn about how the phenomenologies of perceiving and imagining compare.

Perhaps the philosophers who take Perky to have shown something about phenomenology do so because they reject Segal's subliminal interpretation of the results. Perhaps they think that, however things actually are, Perky has shown that it is at least *possible* for perceptions to be mistaken for imaginings, and hence that there are at least possible instances of those states that match in phenomenology. Perhaps they are simply not aware of Segal's work. However that may be, I will argue that, even if we reject the subliminal interpretation, Perky's experiments do not show what these philosophers suppose. They cannot show that perceptions can be mistaken for imaginings, and thus cannot show anything about the phenomenology of the two; for, in an important respect, the subjects' consciousness of the stimulus is not perceptual.

Perky and the philosophers who follow her invite us to see her subjects as mistaking their real state of mind for some other:

Real consciousness:	perceiving the stimulus
Hypothesized consciousness:	imagining the specified object

[2] The closest she comes is to a claim about phenomenology is this: 'It follows [from indistinguishability] that the image of imagination must have much in common with the perception of everyday life' (450).

The perception here is clearly seeing, and the imagining is clearly visualizing (as opposed to imagining in some other sensory mode, or to merely imagining that something is the case). Moreover, an accurate description of the case must allow for the fact that Perky's subjects throughout perceive the screen as a whole and take themselves to be doing so. So the following better captures the facts:

Real consciousness:	seeing the stimulus + seeing the screen
Hypothesized consciousness:	visualizing the specified object + seeing the screen (i.e. visualizing into seen space.)

However, we might wonder whether the first description here is complete. All assume that the subjects' real state of mind is dictated, in key part, by their surroundings. It is, after all, only because the room contains a projected stimulus that there is any temptation to say that the subjects' real consciousness is, in part, a perception of that thing. But what is the stimulus? Not an object of the kind specified: there are no tomatoes, books or bananas in the room. Rather, what is before the subjects is a crude *picture of* such things. As Perky says, her task was to project 'the representation of some object of perception' (1910: 429), something bearing 'the colour and form' of the thing (428). Having set aside the subliminal interpretation, we assume that subjects are consciously aware of the stimulus. But what sort of awareness is this? Given that the stimulus is a picture of the object, presumably it is whatever awareness people generally have of pictures. To characterize the real state of mind of Perky's subjects, we must thus say something about ordinary consciousness of pictures.

When we see things in pictures, we certainly see the pictures themselves. To that extent, pictorial consciousness is clearly perceptual. However, seeing something as a picture involves more. After all, we could see the marks that make up the picture while failing to make sense of them. When they do make sense to us, we are not merely aware of the marks; we are also in some way visually aware of something else, of whatever it is the marks depict. Seeing the *Mona Lisa*, for instance, we see marks

on a canvas, but we are also in some way visually aware of a woman, a landscape, a smile, and so forth.

Can we say any more about this second form of awareness? Here things get controversial. (See, for instance, Wollheim 1987: ch.2; Walton 1992: ch.8; Hopkins 1998; Lopes 2006: ch.1.) However, whatever the precise nature of the awareness, it seems not to be simply another instance of ordinary perception. I certainly don't perceive a woman when I look at the Leonardo – there is no woman to see. Nor do I have visual experience *as of* a woman, i.e. ordinary perceptual awareness that happens not to be veridical. For one thing, in the case of many pictures, my awareness of the depicted object is not very similar in phenomenology to perceptual experience of such objects. Consider, for instance, my awareness of a dog when looking at a line drawing of one, or of a woman when looking at a mosaic depicting her. And for another, if pictorial consciousness combined veridical perception of the marks with non-veridical but otherwise ordinary perception of the depicted object, it would be incoherent. It would represent what is before me as both a set of marks and as, say, a dog or a woman – something no object could be. But pictorial experience is not incoherent. It represents what is before me as something that is itself perfectly coherent: a set of marks *depicting* a dog or woman.

We do better to treat the awareness of the depicted object as quite distinct from our ordinary perceptual consciousness of things. In some way, when I see a woman in a painting, I am visually aware of a woman. However, that awareness is not to be equated with that I have when I see, or seem to see, a woman before me. Since pictorial experience is not incoherent, since it certainly presents marks as really before me, and since it would be incoherent if it also presented a woman as really there, it must involve an awareness of the woman that does not lay claim to how things really are. I am presented with a woman, but not so as to suggest that that is what is really there. Unlike perceptual consciousness, this awareness is non-committal about the reality of its objects. In this respect, if no other, pictorial consciousness is like visualizing, or like our awareness of certain visual illusions. (Consider, for instance, the apparent contours in the Kanisza triangle.)

If this description of our consciousness of pictures is correct,[3] and if, as argued, that is the real nature of our consciousness of Perky's stimuli, then here is the full story about the real state of mind of her subjects:

Real consciousness:	seeing the stimulus + non-committal visual awareness of the specified object + seeing the screen

It is this that the subjects misconstrue as above:

Hypothesized consciousness:	visualizing the specified object + seeing the screen (i.e. visualizing into seen space.)

Now, if this is right, we should take a further step. To explain how this misconstrual occurs, we need appeal only to the second and third elements in the subjects' real consciousness. It is those that provide the objects they take themselves to be imagining (the specified object) and seeing (the surroundings). We can thus explain the *contents* of the complex state of mind the subjects take themselves to occupy without reference to the first element in their real consciousness. And nor does that first element help explain the *attitudes* the hypothesized consciousness involves. They take themselves to be *seeing* the screen for the good reason that that is what they are really doing. And, while it is certainly puzzling why they take themselves to be *imagining* the specified object, the obvious place to look for an answer is their non-committal visual awareness of that very object, not their really seeing something else. Thus, the first element in their real consciousness does no work at all in explaining how that consciousness is misconstrued as the hypothesized consciousness. Of course,

[3] Correct or not, it is certainly incomplete. In particular, I have said nothing about how the two awarenesses – that of the marks, and that of the depicted object – combine to form a single state of mind. In my view, the two are not distinct psychological components that are somehow aggregated, but abstractions from a complex whole. (See Hopkins 2010.)

it does work in explaining the nature of their real consciousness: if they didn't see the stimulus, they wouldn't have non-committal visual awareness of the specified object. What it does not do is to figure in an account of how that consciousness is mistaken for something else.

However, once we've come this far, we've done enough to take the sting out of Perky's results. Her subjects do not misconstrue their perception of the stimulus as imagining. Nor, of course, do they misconstrue their perceptions of the surroundings. They identify those correctly, in taking themselves to be seeing the screen. What they do misconstrue is the second element in their real consciousness, visual awareness of the specified object. Yet this, I argued, is not an instance of ordinary perception. It involves the non-committal visual presentation of something other than what one sees to be before one. It is thus significantly like the awareness involved in imagining (visualizing) something. What the subjects confuse is two forms of non-committal visual awareness: a form they are really enjoying, that involved in our experience of pictures, is mistaken for a form they are not, visualizing. It is no doubt interesting that two instances of non-committal visual awareness can be confused in this way. However, it is not nearly as interesting as confusion between a perceptual awareness and an imaginative one. Perky's subjects make the former confusion, not the latter. Perky's experiments cannot, then, show that some perceptions are indistinguishable from some imaginings, or that these two sometimes match in phenomenology.

Some clarifications and comments:

(1) I am not claiming that pictorial consciousness involves visualizing. Our awareness of a depicted object does not amount to visualizing it. If it did, Perky's subjects would hardly suffer any confusion at all. They would correctly take themselves to be visualizing the specified objects. They'd be mistaken only in taking that visualizing to be controlled by their own mental activity, rather than by something in the environment. However, the idea that the awareness we have of depicted objects is visualizing faces serious difficulties that we do well to avoid (Hopkins 1998: 20-1). Our awareness of depicted objects may not be visualizing, but the two do have important features in common. In visually presenting their objects in a non-committal

way, they are significantly alike, and significantly different from perceptual awareness. That is enough to drive the conclusion above.

(2) Nor am I denying that pictorial consciousness is perceptual. It is so at least in part since it involves seeing the marks that make up the picture. The point is that it is not purely perceptual. As well as perception of the marks, it involves visual awareness of the depicted object. That, it turns out, is the only element in the experience that Perky's subjects misconstrue. It is this second element they misinterpret as visualizing, not the genuinely perceptual aspect of their picture consciousness. And that second element, as just stated, is in key respects more akin to visualizing than to perception.

What if someone rejects this way to divide the terrain? She concedes that pictorial experience involves both seeing the picture and being visually aware of the depicted object, but insists that both forms of awareness count as perceptual. Provided the objector accepts my other claims about our awareness of depicted objects, I need not argue. What is key is that Perky's subjects mistake for visualizing a form of awareness that is in important ways similar to it, and unlike ordinary perception. It is true that if we choose to label that form of awareness 'perceptual' we can say that the subjects mistake a perceptual awareness for an imagining. Since, however, the realm of the perceptual now includes two rather different forms of awareness – one laying claim to how the world is, the other not – that mistake remains no more significant than I allowed above.[4]

(3) On my account of Perky's results, though her subjects consciously perceive the projected stimulus, that perception neither figures in their account of their condition, nor plays any role in explaining how they devise that account. What, then, is their relation to their perception of the stimulus? The simplest thing for me to reply is that they are blind to this element in their real consciousness. They see the stimulus: setting aside the subliminal interpretation commits me to that much. However, they are not aware that they are doing so. They consciously perceive the projected patch, but they are not conscious of this conscious state. It is not clear that the simplest

[4] Certainly we are a long way from Perky's conclusion (n.2 above) that imagining has a good deal in common with everyday perception.

answer is the only one I might give.[5] However, suppose I give it: does this make for trouble?

One consequence of the simple answer is that the state of mind of Perky's subjects differs in one respect from ordinary pictorial consciousness. In the latter, we both see the marks composing the picture and are aware that we see them. However, it should be no surprise that the subjects' pictorial experience is special. The challenge posed by Perky's experiment is precisely to see how to describe their situation, given that it does not fit straightforwardly into any of the usual categories.

It might be thought that another consequence is that my interpretation of the experiments is not, after all, independent of the subliminal account. Don't I too make central use of the idea that the subjects are not conscious of something important? However, even so, the accounts remain distinct. Distinguish:

> (a) The stimulus, though seen subliminally, remains below the subjects' threshold for being consciously perceived.
>
> (b) The stimulus is consciously perceived, but subjects are not aware of this, when making sense of their situation.

The subliminal interpretation turns on (a). The development of my position currently under consideration turns on (b).

Is (b) possible? It is no doubt unusual, but, again, nobody thinks the situation of Perky's subjects is ordinary. Moreover, it would be easy to overestimate the oddness here. The suggestion is not that there is a conscious visual experience to which the subjects are entirely blind. Conscious experience of the stimulus is itself an aspect of

[5] In the case of some of Perky's subjects, there is reason not to give it. One said 'at first I think of it [the specified object] as flat, as if painted'; and another described the colours he knew to be 'in your mind' as 'look[ing] like shadows' (Perky 1910: 432). These descriptions make reference to flatness, a feature of the stimulus that it does not share with the specified object. Thus it is not plausible that these subjects were wholly blind to what they saw, and so not plausible that they were wholly unaware that they were seeing.

a larger experiential whole, pictorial consciousness. The subjects are aware of one aspect of that consciousness, non-committal awareness of the picture's object, for that is what they misconstrue as imagining. Their blindness is limited to the other aspect of their overall state. Indeed, in treating them as aware of only some aspects of their real consciousness, the proposal is on a par with Perky's view. On her account, subjects are not aware that their conscious state is a perception, since they take it to be imagining. Nor, we might add, are they even completely aware of the state's contents, since while what they see is a projected image, what they take themselves to imagine is an object, such as a banana. (Remember Perky assumes that their real consciousness is dictated by what they are in fact seeing.) Thus Perky too must allow that the subjects are not fully alert to the nature of their conscious states. Perhaps endorsing (b) takes me further down this road. For now there is a complex experience with two contents (the projected image and the object seen in it), and though subjects are consciously aware of both contents, for one of the pair they are not at all conscious of that conscious awareness. Even so, the difference between the positions looks to be a matter of degree. It is hard, therefore, for a defender of Perky's position to treat my adoption of (b) as conclusive reason to reject my view. Indeed, it is unclear that this difference between them even constitutes a reason to prefer Perky's account to mine.

(4) The images Perky and Segal projected were generally, as far as can be gleaned from their descriptions, pretty crude. The coloured shapes projected (a red circle, for instance, in the case in which subjects were asked to imagine a tomato) might equally well support pictorial consciousness of many things. (A similar stimulus prompted one of Segal's subjects to 'imagine' the sun – Segal 1971: 91-2) No doubt asking the subjects to imagine particular objects played a key role in determining what they saw in the ambiguous stimuli projected. This might lead one to wonder whether the stimuli really count as pictures, and thus whether I am justified in claiming that the subjects' real consciousness is pictorial. However, the crudeness of the projected images is grist to my mill. We adopt a pictorial consciousness towards various things, not all of them pictures (Wollheim 1987: 46-7). The less those items compel us to adopt that consciousness, the more freedom we have in what we see in them. But the more freedom we have, while seeing the item, in forming the non-committal visual awareness of something else, the closer the case is to straightforward exercises of

visual imagination. Thus the less like ordinary pictures Perky's projected stimuli turn out to be, the more similar is the relevant aspect of her subjects' real consciousness to that to which they assimilated it: visualizing the specified object. Far from weakening my argument, the current observation strengthens it.

(5) I do not say that the account I've offered fits every case the experimenters describe. In some of Segal's cases in particular it is not especially plausible that pictorial consciousness is involved. For instance, asked to imagine a street, subjects were presented with a pattern of nine brown dots, some larger, some smaller, arranged in a circle (Segal & Fusella 1969; Segal 1971: 93). Although projecting this stimulus did affect what was imagined (for instance, a street full of potholes), it is hardly likely that it did so because subjects saw such a street in the bare geometrical design before them. Here the design really is too thin to support the relatively rich content the subjects describe. In these cases, then, some other account must apply.

However, this concession does not undermine my argument. The cases which my account fails to fit are also ones for which Perky's interpretation fails. Her claim is that subjects mistake seeing for visualizing. For that to be at all plausible, there must be a close correlation between what is seen and what visualized. After all, it is hardly plausible that seeing brown circles is mistaken for imagining a potholed street. Or, to take one of various cases of Segal's in which the projected stimulus actually conflicts with what the subject was asked to imagine, it is not plausible that seeing a picture of an elephant is mistaken for visualizing a glass of iced tea (Segal 1971: 93). Why not? Perky implicitly assumes that the nature of perceiving and imagining, at least as it registers with the subject, is determined by the contents of those states, not the attitudes borne to those contents. That is why Perky concentrated on cases in which the contents closely match – i.e. in which the object to be imagined is the same as that depicted by the projected image. Doing so allowed her to test whether the subject was sensitive to which attitude (seeing or visualizing) to those contents was involved. The projection of simple geometrical patterns, let alone of images of objects 'incongruent' with the specified object, had to wait for Segal's work, testing a rather different hypothesis (Segal 1971 pp.90-4).

Thus cases that my account struggles to fit are also problematic for Perky's view, and cases for which her account is plausible are also ones my account fits. Yet above I argued that my account is preferable to hers. It gives a more accurate account of subjects' real consciousness in the cases Perky explored, since it pays closer attention to what is in fact before them. It may be that some other theory, such as Segal's, covers a wider range of cases than either my view or Perky's. Perhaps that's a reason to prefer that theory. But it was never my goal to argue against Segal's view. I merely aim to show that, if for some reason the subliminal interpretation is rejected, my view still trumps Perky's. Either way, then, the experimental evidence does not support her conclusion.

(6) These dialectical observations also serve to handle another possible objection. Segal came to think that the only features of the projected stimuli that determine subjects' states of mind are form, colour and perhaps texture (1970: 208-9; 1971: 93). That might be taken to suggest that, even when what is projected is a picture of the specified object, the pictorial nature of the stimulus does no work. What matters is that the stimulus matches the specified object in form and colour, not that it prompts pictorial consciousness. Whatever the merits of this objection to my view, it will not bear on the wider position unless it provides a reason to prefer Perky's position. However, Segal justifies her claim about which features matter by appeal to precisely those cases that are problematic for Perky – those in which what is projected is either a simple geometrical pattern, or an image of something 'incongruent' with the specified object. Since that claim is justified by appeal to evidence that undermines Perky's theory, it cannot be used to argue that Perky's view is preferable to mine.

Conclusion

Close investigation of the real consciousness of Perky's subjects reveals that, even setting aside subliminality, her results do not show what many have presumed. Their real state of mind is not perception of the specified object but pictorial consciousness of it. What they mistake for visualizing the specified object is one aspect of that consciousness – awareness of the depicted object, an aspect which bears significant similarities to the state with which it is confused. And, while their pictorial consciousness is in part perceptual, the perceptual element plays no role in shaping

the account they give of their state of mind, and is thus not mistaken for anything else. (Indeed, it may be that that they are simply blind to that aspect of their real consciousness.) The experiments thus show nothing about the indistinguishability, let alone the phenomenal similarity, of perceiving and imagining.

To bear on those issues, the experiments would need revising. Subjects would have to be exposed, not to pictures of the specified objects, but to those objects themselves. Given current technology, this might prove possible. It is, for instance, possible to control the opacity of specially treated glass screens using electricity. One can imagine a variation on Perky's experiment in which the increasing transparency of such a screen gradually exposes subjects to the very objects they have been asked to imagine. However, it is an entirely open question what the results of such an experiment might be. Certainly we can conclude nothing on that score from the Perky-Segal results. For why should the possibility of confusing with visualizing the non-committal visual awareness involved in seeing an object in a picture show anything about the possibility of confusing with visualizing a perception of that object? What Perky did not show her subjects was tomatoes, bananas or books; but crude pictures of them. What her experiment therefore cannot show is that perceiving such objects is indistinguishable from visualizing them.[6]

Robert Hopkins
University of Sheffield

[6] It is natural to wonder whether Perky's results can be obtained for other sense modalities. As far as I have been able to discover, there is very little experimental evidence bearing on this question. There is some work establishing the 'Perky effect' in other senses (e.g., for hearing, Segal & Fusella 1970 and Okada & Matsuoka 1992). However, searches of major databases for psychological literature (PsychINFO and the APA PsycNET) fail to turn up any work supporting conclusions of the kind Perky herself drew.

Bibliography

C.Craver-Lemley & A.Reeves. 1992. 'How Visual Imagery Interferes with Vision' *Psychological Review* 99, pp.633-49

R.Hopkins. 1998. *Picture, Image & Experience* Cambridge: CUP

---- 2010. 'Inflected Pictorial Experience: Its Treatment and Significance' in C.Abell and K.Bantinaki ed.s *Philosophical Perspectives on Depiction* OUP pp.151-180

Amy Kind 'Putting the Image Back in Imagination' *Philosophy and Phenomenological Research* Vol. 62, No. 1 (Jan., 2001), pp. 85-109.

D.M. Lopes. 2006. *Sight and Sensibility* Oxford: OUP.

Bence Nanay. 2010. 'Perception and imagination: Amodal perception as mental imagery' *Philosophical Studies* 150:2, pp.239-54.

H.Okada & K.Matsuoka. 1992. 'Effects of auditory imagery on the detection of a pure tone in white noise: Experimental evidence of the auditory Perky effect' *Perceptual & Motor Skills, 74*, 443–448.

C.W.Perky 'An Experimental Study of Imagination' *The American Journal of Psychology* 21:3 pp.432-452.

S.J. Segal. 1971. 'Processing of the Stimulus in Imagery and Perception' in Segal, ed. *Imagery: Current Cognitive Approaches* Academic Press: New York, pp.69-100

---- 1972. 'Assimilation of a Stimulus in the Construction of an Image: The Perky Effect Revisited' 1972, in P.Sheehan ed. *The Function & Nature of Imagery* Academic Press, NY, pp.203-230.

S.J.Segal & S.Nathan. 1964. 'The Perky Effect: Incorporation of an External Stimulus into Imagery Experience under Placebo and Control Conditions.' *Perceptual and*

Motor Skills (18) 385-395.

S.J.Segal & V.Fusella. 1969. 'Effects of imaging on signal-to-noise ratio, with varying signal conditions.' *British Journal of Psychology* 60(4), pp. 459-464.

S.J.Segal & V.Fusella. 1970. 'Influence of imaged pictures and sounds in detection of visual and auditory signals' *Journal of Experimental Psychology*, 83, pp.458-474.

Michael Tye. 1991. *The Imagery Debate* Cambridge, Mass.: MIT Press

K.Walton. 1992. *Mimesis as Make-Believe* Cambridge, Mass.: Harvard UP

R.Wollheim. 1987. *Painting as an Art* London: Thames & Hudson