

Nanay on Attention and Intentionalism

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Nanay (2010) defends intentionalism about visual experience against some supposed counterexamples, by claiming that attention to part of a scene makes visual experience represent more determinate properties there. This claim is subject to an empirical test. The test suggests that some forms of attention make visual experience represent more determinate properties (see also Stazicker *forthcoming*). However, once we distinguish between the different forms of attention and their different effects, the test shows that Nanay's defence of intentionalism is not adequate as it stands.

1. The dispute about intentionalism and attention

I'll understand intentionalism about visual experience as follows:

(IV) The phenomenal character of visual experience supervenes on the intentional content of visual experience.

According to (IV), every difference in the phenomenal character of visual experience entails a difference in its intentional content.

One sort of putative counterexample to (IV) involves a pair of experiences of the same scene, such that in each experience you attend to a different part of the scene; some such pairs, it's claimed, are distinct in phenomenal character but identical in intentional content. I'll work with the following example from Speaks 2010. A horizontal line bisects each of four evenly-spaced vertical lines. The resulting pattern occupies more or less the whole of your visual field. If you attend to the intersection of the horizontal line and the second vertical line from the left, your visual experience seems to differ in phenomenal character from the experience you enjoy

if you attend to the intersection of the horizontal line and the second vertical line from the right. If the experiences so differ, but are identical in intentional content, (IV) is false.¹

Nanay defends (IV) by claiming that these experiences, and those involved in other putative counterexamples, differ in intentional content: each experience represents more determinate properties than the other at the part of the scene that's attended. To understand how the empirical evidence bears on this claim, we need to understand the connection between determinable properties and spatial resolution.

2. *Determinable properties and spatial resolution*

Roughly, property *A* determines property *B* where to have *A* is to have *B* in a specific way (Johnson 1921): *being square* determines *being quadrilateral*, which determines *being shaped*; *being twelve feet long* determines *being between ten and fifteen feet long*. Determination is transitive and asymmetrical, so several properties may form an ordered series, each determining those which follow it. A property is more or less determinate (or determinable) depending on its position in such a series.

The spatial resolution of a response is given by the maximum spatial frequency to which it's sensitive. Spatial frequency consists in the rate of change of a phenomenon across space. For example, a scene in which light-intensity varies sharply across small distances is high in spatial frequency. Visual spatial resolution is highest at the fovea and progressively lower away from the centre of the eye. Spatial resolution is limited even for foveated objects: even when you look right at something, there are spatial frequencies across it to which your visual system is insensitive (De Valois and De Valois 1988).

For the purposes of this discussion, assume:

- (1) Visual experience represents objects' spatial properties.

¹ Speaks ultimately defends (IV) by claiming that the phenomenal change here is non-visual, occurring in a *sui generis* modality of attention. I won't discuss that proposal here.

Since the visual system is insensitive to a varying range of high spatial frequencies, it's insensitive to differences, below a certain varying magnitude, in the locations of edges and in the shapes and object-locations which those edges define. Therefore:

- (2) Objects' spatial properties are reliably correlated with visual-system responses only where these properties are determinable to a certain varying degree, a degree fixed by visual spatial resolution.

In some theories,² (1) and (2) jointly entail:

- (3) Visual experience represents objects' spatial properties only where these properties are determinable to a certain varying degree, a degree fixed by visual spatial resolution.

In any plausible theory, (1) and (2) together should make (3) the default position. The reliable correlates of experience form a core constraint on its interpretation: special motivation is required if we're to say that experiences represent properties with which they're not reliably correlated. Other constraints, such as robust introspective data, might ultimately trump this one. Equally, visual experiences might achieve reliable correlation with some properties in virtue of processes outside the visual system. But there's no clear reason to anticipate either sort of exception here.³

We're now in a position to assess a preliminary disagreement between Speaks and Nanay. Speaks argues that 'given the simplicity of the figure, it does not seem plausible to claim that one experience represents a given portion of the lines with more detail or determinacy' (2010: 329). Nanay responds, 'Even the simplest figure has properties. And any property can be represented at varying degrees of determinacy' (2010: 267). The point of disagreement is whether visual experience of Speaks's figure could, in principle, come to represent more determinate aspects of it than it represents pre-attentively. By (3), the answer is

² E.g. the conjunction of Fodor 1983 and Fodor 1990.

³ I've heard some philosophers claim to introspect visual experience of maximally determinate spatial properties, but I suspect they're guilty of a certain scope confusion: experience doesn't seem to specify point-like boundaries of objects; rather, it seems to be determinate what boundaries experience specifies.

that it could: visual spatial resolution is always limited, so no line-drawing is so simple that visual experience could not, in principle, come to represent more determinate properties of it.⁴

However, Nanay's defence of intentionalism turns on a further claim, that attention in cases like Speaks's makes visual experience represent more determinate properties at the attended part of the scene. Is this true?

3. *Attention and spatial resolution*

Psychologists distinguish between overt attention, which in the visual case involves movements of the head or eye, and covert attention, which involves no such observable behaviour. Given (3), overt attention to part of a scene makes visual experience represent more determinate spatial properties there: in attending overtly, you foveate what was previously in peripheral vision. However, Speaks's example is designed so that overt attention remains fixed: he clearly intends that the figure occupy more or less the whole of your visual field even as you shift attention. So Nanay's defence of (IV) turns on the claim that *covert attention* to part of a scene makes visual experience represent more determinate properties there.

Covert attention is often attracted to a location independently of your aims and decisions, by a sudden change there. Yeshurun and Carrasco (1998) tested the hypothesis that visual spatial resolution is increased where attention is captured in this way. They used a texture-segregation task: subjects had to report which of two briefly-presented stimuli contained a patch in which lines were uniquely oriented relative to the rest. In general, we're better at texture-segregation as stimuli near foveation and spatial resolution increases. But some texture-segregation tasks require an intermediate resolution: 'a more global inspection of the display is required, [as] when one is appreciating an impressionist painting' (Yeshurun and Carrasco 1998: 74). If cuing attention to a stimulus just made visual processing of it more reliable, or just improved our judgements about it, cuing attention would make subjects better

⁴ Nanay allows that when attending we might see maximally determinate spatial properties. By (3) we should deny this.

at texture-segregation even in tasks which require intermediate resolution. But if cuing attention increases visual spatial resolution, it should sometimes make subjects worse at the task.

Yeshurun and Carrasco flashed a small bar just above the location of the texture to be segregated, shortly before the texture appeared. With the texture at or near foveation, where spatial resolution is already too high for the task, cuing attention in this way made subjects worse at the task than they were without cuing. By contrast, cuing attention improved subjects' performance with the texture and cue at peripheral locations, where without attention spatial resolution is too low for the task. This strongly suggests that covert attention increases visual spatial resolution, mimicking the effect of foveation. By (3), covert attention to part of a scene makes visual experience represent more determinate spatial properties there.

However, in Speaks's example and the others Nanay discusses, you direct covert attention voluntarily to some part of the scene. So Nanay's defence of (IV) rests on the claim that *voluntary covert attention* makes visual experience represent more determinate properties. This is not demonstrated by Yeshurun and Carrasco's (1998) study of automatic, involuntary covert attention. In that study, the attentional cue did not predict whether or not the stimulus contained a unique texture, so there was no reason for subjects voluntarily to direct their attention to the location of the cue. Moreover, the stimuli were presented too quickly for subjects to orient attention voluntarily (which takes around 0.3 seconds). And there is a growing body of evidence that voluntary attention has systematically different effects from involuntary attention (Prinzmetal and Landau 2008).

Yeshurun et al. (2008) tested the effects of distinctively voluntary covert attention using a semantic cue. They showed subjects numbers that indicated which part of the scene they should attend to, and allowed them enough time to attend voluntarily. In texture-segregation tasks for which involuntary attention either impairs or improves performance, depending on the location of the stimulus relative to the fovea, voluntary covert attention only ever improved performance. Since representing more determinate spatial properties ought to inhibit performance at some locations, we can't explain the improved performance just in terms of the idea that attention makes visual experience represent more determinate spatial properties.

Yeshurun et al. suggest two possible explanations, to which I'll add a third:

- (i) Voluntary attention reduces the noise in early visual processes, without altering visual spatial resolution.

As modelled in signal detection theory, a reduction in noise may make a system more reliable in selecting among possible representations, without altering the semantic value of the representations generated (MacMillan and Creelman 2005). If (i) is correct, the phenomenal change brought about by voluntary attention does not entail a change in the intentional content of visual experience.

- (ii) Voluntary attention is more 'flexible' than involuntary attention, in that voluntary attention either increases or decreases visual spatial resolution to suit the task at hand.

This looks more promising for the intentionalist, but in fact it should just prompt a refinement of the putative counterexamples to (IV). Take a case in which, without focussing attention on it, you're already seeing a stimulus in just the spatial resolution required for your task. Now focus attention on the stimulus. The determinacy of the spatial properties represented ought to remain fixed. Still, it's hard to believe that under these circumstances attending will bring about no phenomenal change – that conscious attention is simply impossible. So here we should expect a phenomenal change that doesn't entail a change in the intentional content of visual experience. Against this, you might insist that such cases involve no phenomenal change. But that would be a surprising empirical result, so this strategy inherits a substantial burden of empirical proof.

- (iii) Voluntary attention increases spatial resolution just as involuntary attention does, but voluntary attention in some other way ensures that subjects are better at detecting the unique texture, mitigating the detrimental effects of resolution that's too high.

Assuming that the positive effect of voluntary attention has some phenomenology or phenomenal correlate, here again we have a phenomenal change which doesn't entail a change in the intentional content of visual experience. You might argue that the positive effect of voluntary attention here has no phenomenology or phenomenal correlate. But again this would be a surprising result. Covert voluntary attention seems, on the face of it, to be a paradigm case of improved performance *through* heightened consciousness.

Interpretations (ii) and (iii) draw on the evidence about involuntary attention, claiming that voluntary attention has somewhat similar effects. Interpretation (i) denies this. Whichever interpretation we prefer, the evidence favours the view that, although attention sometimes makes visual experience represent more determinate properties, covert voluntary attention to what you see brings about phenomenal differences over and above any which entail this difference in intentional content. Pending convincing alternative accounts of the evidence, we should work with the claim that the phenomenology of attending in this way does not supervene on the intentional content of visual experience.

4. Exploiting Nanay's insight

Still, it doesn't obviously follow that (IV) is false – that the phenomenal character of visual experience does not supervene on its intentional content. This doesn't obviously follow, because it's not obvious that the phenomenology of attending voluntarily to what you see is exhausted by the phenomenal character of visual experience.

Consider William James' famous definition of conscious attention:

Every one knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence.

(James 1890/1950: 403)

James captures the ordinary idea that attending can consist in a concentration of your conscious thoughts. This is consistent with the idea that attending may also consist in a concentration of distinctively visual consciousness – for example in an increase in the determinacy of the properties represented in visual experience. Indeed, particular episodes of conscious attention might consist in a concentration of both forms of consciousness.

So this traditional definition suggests a way to exploit Nanay's insight in defence of (IV). The intentionalist could accommodate our sense that voluntary covert attention effects visual phenomenal changes, by arguing that these changes entail visual experience's representing more determinate properties. And she could accommodate any further phenomenal

changes by arguing that they occur in conscious thought. According to this defence of (IV), the phenomenal character of visual experience supervenes on the intentional content of visual experience, but the overall phenomenology of attending voluntarily to what you see does not. This defence of (IV) would involve arguing for interpretation (ii) or (iii) above. So it would involve tackling difficult empirical questions about the relationships between voluntary and involuntary attention: do they have effects in common; are the effects of one a guide to the effects of the other?⁵

Here I won't offer more than this very brief sketch of how we might exploit Nanay's insight against putative counterexamples like Speaks's. However, we should also note a further, related issue which attention raises for (IV), and which can be obscured if we consider only pairs of experiences in the manner of Speaks. On the face of it, you can attend to something more or less. (IV) requires that, where the degree to which you're attending is a visual phenomenon, this can be captured within the scope of visual experience, in terms of a matter of degree in its content. This requirement is in tension with the natural idea that how much you're attending to something can be ineliminably a change in how much you're attending, a change in the mode of representation, rather than a change within its content. Any plausible defence of (IV) must make a convincing case that this natural idea is mistaken, in addition to dealing with counterexamples such as those discussed here.

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⁵ See e.g. Prinzmetal and Landau (2008) for an argument that these forms of attention have thoroughly disjoint effects.

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