Attention, Salience, and the Phenomenology of Visual Experience

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Abstract

Both introspection and empirical studies suggest that visual attention can affect the phenomenology of our visual experience. However, the exact character of such effects is far from clear. My aim in this chapter is to spell out the main difficulties involved in attempting to achieve a clearer view of these effects, and to make some suggestions as to how we can make progress with this issue while avoiding tempting mistakes. I do this by discussing the question of whether there is a sense in which attention to a seen object can be said to contribute to the object's visual phenomenal salience. It is often suggested that focusing visual attention on a seen object renders the object phenomenally salient. I look at potential evidence for this suggestion, and consider what form, if any, of visual phenomenal salience it may support.

1. Introduction

We seem to have strong evidence – both introspective and experimental – that visual attention can affect the phenomenology of our visual experience. (By 'the phenomenology of visual experience' I mean the subjective character of one's visual experience – i.e., how things are, visually, from one's own perspective. Henceforth, unless specified otherwise, 'attention' should be read as 'visual attention', and 'phenomenology' as 'phenomenology of visual experience'). However, the exact character of such effects is far from clear. My aim in this paper is to spell out the main difficulties involved in attempting to achieve a clearer view of these effects, and to make some suggestions as to how we can make progress with this issue while avoiding tempting mistakes. I shall do this by discussing the question of whether there is a sense in which attention to a seen object can be said to contribute to the object's apparent or phenomenal saliency.

Several philosophers have recently suggested that focussing visual attention on a seen object renders it phenomenally salient/prominent/central/highlighted/at the foreground (where it is suggested that these expressions are meant to capture the same aspect of the phenomenology).[1] According to some of the philosophers in question,[2]

[1] For simplicity's sake, I'll just use 'salience' to describe this effect. The claim that attention has a saliency effect isn't new, and recent philosophers who discuss it – e.g., Stazicker (2011), Watzl (2011, 2017), Wu (2011, 2014) – usually take the effect to be one that William James emphasized in *The Principles of Psychology* in 1890, and which has been widely acknowledged by both philosophers and psychologists. Part of the reason for my focus on the views of certain recent philosophers is that, in their discussions, they wish to distinguish clearly between, on the one hand, effects of *visual* attention on the phenomenology *of visual experience*, and on the other hand, effects of attention in general (including cognitive attention) or effects on non-visual phenomenology. It's worth emphasizing that the use of 'salience' here is distinct from its use to refer to an aspect of objects in virtue of which they attract one's visual attention (the latter is the way salience is ordinarily used in empirical work on visual attention). The use of 'salience' here differs also from Watzl's (2017, 2022). Watzl uses 'salience' to refer to an aspect of mental states that (by definition) attracts attention to them; where 'phenomenal salience' is the 'felt' attracting aspect. (In Watzl's words 'Phenomenal salience is a *felt* command to attend to something…' 2017 p.213)

[2] E.g., Speaks (2010), Watzl (2011, 2017), Beck and Schneider (2017).

this effect on the phenomenology is distinctive of attention, and thus it cannot be fully captured in terms of the ways the experience presents (or represents) the environment as being (e.g., the attended object appearing larger or brighter than its surroundings). I'll argue that there are no good reasons for accepting this view. Instead, I'll suggest a more modest sense in which visual attention may contribute to the apparent/phenomenal salience of seen objects.

In §2 I focus on introspection as a source of evidence regarding the effect of attention on the phenomenology (where I use 'introspection' to refer to what we commonsensically regard as our ability to learn about our mental life 'from within'). The reader will be offered the opportunity to try to experience effects of visual attention on the phenomenology of visual experience. I'll then point out the inherent limitation on our ability to learn about the effect of attention on the phenomenology by introspection. In §3 I turn to the question of whether and how empirical work on visual attention can contribute to our attempt to find out more about the exact character of the effect on the phenomenology. In §4 I consider the claim that focused visual attention has a distinctive saliency effect on the phenomenology of visual experience, an effect that cannot be captured in terms of the ways seen objects are presented in the experience as being. I'll look at potential ways of supporting the claim and argue that they do not provide sufficient support.

Before I start on those tasks let me explain the motivation for the discussion in this paper and highlight the significance, in this context, of the questions I'm asking about visual phenomenal salience. My interest in the effect of visual attention on the phenomenology of visual experience arises from an interest in philosophical accounts of visual experience. Such accounts are constrained by facts regarding the phenomenology of visual experience, and thus to be able to evaluate them one needs to get the details of the phenomenology right. The effect of attention on the phenomenology is particularly interesting since (a) we constantly shift visual attention during our everyday interaction with the environment, (b) the effect isn't transparent to us because of the dependence of introspection on attention discussed in §2, and (c) the effect potentially creates difficulties for two currently popular accounts of visual experience (namely, representational/intentional and relational accounts).[3] Now, as mentioned earlier, it is a widely held view that there's a kind of phenomenal salience which results from focusing attention on a seen object.[4] Being interested specifically in the phenomenology of *visual experience*, we want not only to clarify exactly what such phenomenal salience involves, but also to make sure we distinguish the effects of visual attention on *visual* phenomenology from coinciding effects on one's

[3] Potential challenges, to these two views, posed by effects of attention are discussed, for example, by Chalmers 2010, Beck and Schneider 2017, Block 2010, 2015, Brewer 2013, Ganson and Bronner 2013, Speaks 2010, Stazicker, 2011, Watzl 2011, 2017, 2019, Wu 2011, 2014. Note that in this paper I focus on the way attention affects the experience of seen objects. A different (though related) type of challenge to all accounts of visual experience concerns the effect of attention on the experience of the whole scene, where the focus is on empirical data that suggest that some amount of attention to an aspect of the environment is necessary for it to be seen, and the challenge is to reconcile this with the fact that introspection suggests that we have a fully detailed experience of the whole scene.

[4] See fn.1.

phenomenology in general (e.g., arguably, singling out a seen object in thought, intending to keep track of it, etc., contribute to how things are for one 'from the inside' beyond any contribution this might make to how things are for one visually). Thus, our inquiry into the character of the effect of attention on the phenomenology of visual experience involves asking: In what sense(s), if any, are visually attended objects phenomenally salient? To what extent is their phenomenal salience due to the effects of attention on the phenomenology of *visual experience*? And if there are effects on visual phenomenology that contribute to such salience, what more can we say about the exact character of these effects? (Note that this focus on the saliency effect of attention bears directly on current debates in philosophy of perception. One of the ways of arguing that the effect of attention poses a challenge to representational/intentional and relational accounts of visual experience, point (c), is to claim that attention has a distinctive saliency effect on visual phenomenology, which cannot be captured in terms of ways objects are (re)presented as being.[5])

There is also another, somewhat less direct, way in which the effect of attention on the phenomenology bears on accounts of visual experience. Arguably, a further constraint on such accounts is that they should make intelligible the role that visual experience plays in enabling us to entertain demonstrative thoughts about seen objects and in enabling us to gain knowledge about such objects. Visual attention is, arguably, essential to both, and it is plausible that its effect on the phenomenology is relevant to understanding the role it plays in both. One example, to which the present discussion of a saliency effect is relevant, is John Campbell's suggestion (2002) that a kind of saliency due to attention (which he refers to as 'highlighting') plays a role in our ability to entertain demonstrative thoughts about visually attended objects.[6] An immediate question for such a view concerns exactly what the relevant saliency contributes to the explanation of our ability to entertain demonstrative thoughts. And to answer this question we need to have a clearer view about what such saliency involves. Furthermore, it seems that to have such an explanatory role the relevant kind of salience shouldn't depend on 'cognitive attention', in particular on the subject's singling out the object in thought. Thus, for a proposal like Campbell's to be viable, it must be possible to trace the causes of this form of salience to the operation of a form of attention that is distinctively visual, rather than cognitive.

To emphasize, I am not going to defend any particular claim concerning philosophical accounts of visual experience (or demonstrative thought). Similarly, I am not going to defend any specific positive view about the exact character of the

[5] This challenge is discussed by Chalmers 2010, Speaks 2010, Watzl 2011, 2017, and Wu 2011, 2014.
[6] Note that the claim that the saliency in question plays a role in an account of demonstrative thoughts is consistent with Nowak and Michaelson's (2022) claim that what they call 'salience-based theories of reference' are untenable. The former is a claim about demonstrative *thought*, and it is specifically limited to the role of *visual* attention in enabling *simple vision-based* demonstrative thoughts. In contrast, the latter claim concerns the determination of the reference of demonstrative-involving *linguistic utterances*, and Nowak and Michaelson's considerations in support of it are specific to the use of language in communication. Furthermore, the latter claim isn't limited to cases in which the salience involved in determining reference is due to visual attention, it is meant to apply, equally, to cases in which salience is due to cognitive attention.

effect of attention on the phenomenology and the sense in which this effect may contribute to the visual phenomenal salience of attended objects. My aim is merely to spell out the main difficulties involved in attempting to achieve a clearer view of the effect of attention on the phenomenology (with emphasis on phenomenal saliency), and to distinguish steps that may help us to achieve some further clarity from unhelpful ones.

2. Introspection

I said at the start that there seems to be introspective evidence that visual attention can affect the phenomenology of our visual experience. To experience one such effect, try to keep your eyes more or less fixed on the central area of Figure 1 and shift your attention to the green shape and then to the red one.

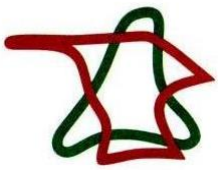

Fig. 1 (from Rock 1995, p.144)

When you shift attention from one shape to another, do you experience a change in the phenomenology (that is, in how things are visually for you)? If so, can you specify exactly what the character of this change is? I asked several people about their experience in this and similar tasks. Many reported that the change in the focus of attention seemed to them to be accompanied by a change in phenomenology (some with more confidence, others with less). However, they are generally unsure about the exact character of this change. Some are happy to accept a description of the change as involving the attended shape 'coming forward' or becoming more salient or prominent, while the unattended one recedes to the background or becomes less salient or prominent; though what exactly is meant by any of these terms is left open.[7] Some say that the attended shape is in some sense seen more clearly, perhaps in more detail (this is especially notable when one is instructed to attend to, say, the green shape prior to seeing Figure 1, and is then shown the figure for a limited amount of time).

If you experience a change in the phenomenology when shifting attention between the two shapes, you too are likely to be unsure about the exact character of the

[7] 'Unattended' should be read here as 'not in the focus of the subject's attention (when the subject's attention is focused on some object)'. For even when we focus attention on one object we may still allocate some attention to other seen objects. (In fact, the discussion below suggests that it's likely that in the kind of case we are considering we do allocate attention to the 'unattended' object). In addition, I'd like to stay neutral on Mack and Rock's (1989) claim that some amount of attention to an object is required for having an experience of it.

change. For there is an inherent problem with the attempt to introspect the character of the experience of an object or property when visual attention is focused on a different object or property. We cannot direct introspective attention to an aspect of our visual experience (e.g., the way the green shape appears to us) without also directing (visual) attention towards the object or feature this aspect is an experience of (e.g., the green shape).[8] Thus, for example, when one's visual attention is focused on the red shape in Figure 1, one's introspective attention isn't simultaneously directed at one's experience of the green shape. To introspectively attend to that experience, one will need to increase the amount of visual attention allocated to the green shape; but this may, potentially, affect the phenomenal character of the experience. It seems unquestionable that to learn about the exact character of the experience of an object one needs to direct introspective attention toward this experience; and so the dependence of introspective attention to visual experience on visual attention means that introspection alone can't provide us with a clear view of the exact character of the experience of the unattended object, and thus also of the exact ways in which it differ (if any) from the experience of the object when attention is focused on it.

We may still look for ways in which we can use introspection to gain *some* further information about the way attention affects the phenomenology. For example, it seems that we (or rather some of us) can, sometimes, notice particular effects like increase in apparent size, contrast, or colour saturation of an attended object relative to an unattended one, if we shift our attention between two identical stimuli. For example, try, while fixing your gaze on the black square in the middle of Figure 2, first to equally attend to both patches, and then to shift your attention to the right-hand patch. (The reason you are asked to shift attention while keeping your gaze fixed on a fixation point mid-way between the two patches is that the direction of one's gaze has a notable effect on the phenomenology. The centre of the human retina, called the fovea, is significantly more sensitive to light than its surroundings, and the sensitivity decreases with distance from the fovea. That means that what we direct our gaze towards can be seen more sharply and clearly than other things in our visual field. And the sharpness and clarity decrease the farther the seen thing is from the direction of gaze. When the direction of attention corresponds to the direction of one's gaze we call is 'overt' and when its direction differs we call it 'covert', and the same holds for shifts of attention.) When both patches are attended to equally, you are likely to experience the contrast between the dark and light stripes of the patches to be the

[8] The formulation in the text is meant to capture a phenomenon we all encounter when we attempt to introspect our visual experiences (see Martin 1998). I'm simplifying here by focusing on the ordinary case, when we aren't hallucinating. What matters for our purposes is that from the subject's perspective, directing their introspective attention towards a certain aspect of their visual experience can't be separated from doing what one does when one shifts visual attention towards the object or property this is an experience of (for a subject who believes they are hallucinating, introspecting an aspect of their experience would involve attempting to shift attention as they would do if they believed the experience wasn't hallucinatory. See Martin 1998:17, Soteriou 2013, Ch.8). Those who hold that – in contrast to our commonsense view – in the ordinary case our visual experience and visual attention aren't directed towards mind-independent objects/properties would replace the formulation in the text with one that fits their theory, but should still accept the description of how things are from the subject's perspective.

same. Then, when you shift attention to the right-hand patch, you might experience the contrast between the stripes of the right-hand patch as higher than that of the stripes of the left-hand patch (note that not everyone has this experience).[9]

Fig. 2

However, the identification of specific types of changes in the phenomenology in this and similar cases makes only a limited contribution to our understanding of how attention affects the phenomenology. First, in those cases in which we (or rather some of us) identify a particular type of change, we may lack a clear sense of whether this is the only change in the phenomenology and what other changes occur. Second, it isn't clear whether, and if so how, we can generalize to other cases from the special cases in which the display is designed to bring out the particular type of change – e.g., does it generalize to the shift of attention between the shapes in Figure 1? What kind of character will the experience in this case have to have for it to count as manifesting the same effect on contrast? Moreover, as we'll see in §3, there is evidence that the effect doesn't even generalize to all the cases in which it is clear what would count as a similar effect on contrast.

There are also reasons to worry about the reliability of introspection on one's experience when shifting attention between objects in displays such as Figures 1 and 2. The dependence of introspective attention on visual attention raises questions about what we are doing when we try, for example, to keep our attention focused on the red shape (or the right-hand patch) and at the same time also introspect the character of the experience of the green shape (left-hand patch). Perhaps we are increasing the amount of (visual) attention we allocate to the green shape. If so, we would like to know to what extent this affects the experience of the green shape, and to what extent it involves withdrawing attention from the red shape.[10] To start addressing these worries we should attempt to introspect our experiences in relevant controlled conditions that require quite a bit of work to set up.[11] For present purposes, though,

[9] The example is based on experiments, conducted by Marisa Carrasco and her collaborators, which are meant to show specific effects of attention on the phenomenology (for an overview see Carrasco 2009).
[10] A further worry concerns the fact that we are using simple, unchanging displays which are visible to us before we start our introspective exercise. As a result, our experience of the unattended object and our introspective judgement about it could both be affected by prior experience we had while we attended to the object. Things are complicated by the fact that often this is also the case in our everyday interaction with the environment. However, it is still the case that ordinarily the scenes we view are dynamic and much more complex. Some further worries will be mentioned in §4.
[11] Psychologists have been conducting several experiments in relevant controlled conditions in order to determine what information is available to subjects from unattended objects. However, since the psychologists in question aren't interested in the fine details of the phenomenology, they only aim to

we can conclude that introspection on cases like the ones discussed above do at least suggest that attention can have an effect on the phenomenology of our visual experience, and that *as a matter of principle* introspection cannot, by itself, reveal to us the exact character of the affect(s). In the next section I consider how empirical work on visual attention may help us to learn more about the character of the relevant effects.

3. Empirical Work

Experimental research on visual attention aims to uncover and understand the mechanisms responsible for visual attentional phenomena. Central to such phenomena is the selection of some information (from the available visual information) for further processing or for the control of specific actions.[12] Such selection is what takes place in the visual system in the kind of demonstration we considered in the previous section – i.e., very roughly, when we manage to direct attention to the green shape rather than the red one, an underlying mechanism modifies visual processing in such a way that information from the green shape (rather than information from other aspects of the scene) is selected for further processing.

Now, if experimental research can provide us with details about what such modifications involve, it seems reasonable to expect that it can help us to form a clearer view about the effect of visual attention on the phenomenology. For example, if we learn that only very general visual information regarding unattended objects is processed (thus, more specific information doesn't get processed) while both general and more specific information regarding the attended object is processed, then we will have further support to our sense that the experience of the attended object was more detailed than it was prior to our shift of attention towards it, and that it was more detailed than that of the object which was unattended at the time.

Significant progress has been made in research on visual attention, and the combination of behavioural and neurobiological findings has provided quite detailed information about the mechanisms underlying visual attentional phenomena. We may, therefore, hope that this will allow us to form a quite detailed account of the effect of attention on the phenomenology. I do think that the experimental work can help us to clarify the character of the effect of attention on the phenomenology, but it should be clear that there is no simple entailment from relevant empirical findings to claims about the phenomenology.

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determine whether a subject can report (directly or indirectly) the presence of an unattended object and its (coarse-grained) colour, shape, etc. (Carrasco's work is an exception to this, I'll return to her findings in the next section). Even if we agreed that the relevant ability to report is a good indication of whether the subject experienced the object and its properties, it doesn't tell us anything about the differences, if any, between the experience, with and without attention, of the objects and properties that the subject can report when not attending to the object.

[12] I'm using here selection of information as a general term for processes that yield such selection while staying neutral on the exact way in which this result is achieved.

The main obstacle is the fact that not every effect at the level of information-processing shows up in the subject's (conscious) experience.[13] This is particularly clear for effects that take place at early stages of visual processing – where the processing of information from a relatively narrow location during a relatively brief period of time is relatively unaffected by information from other locations and other times – because its contribution to the subject's experience may vary according to relationship with information from other parts of the visual field and with information gathered at subsequent times. It is interesting here to consider, as an example, an effect of attention on early visual processing which, *in certain circumstances*, can show up in the subject's visual experience. Experimental findings suggest that when attention is directed covertly to a certain location there is an increase in relevant neural responses to stimuli at that location. Thus when one fixes the gaze on the black square in Figure 2 and attends to one of the patches, say the right one, there's an increase in the activity of neurons that respond to the right patch. Marissa Carrasco has suggested that due to this increase in activity the neural response resembles the response to a patch which is of higher contrast when attention is distributed more or less equally over the display, and that the increased activity is interpreted in the visual system as a signal of a patch of higher contrast.[14] Furthermore, in carefully controlled experiments, Carrasco finds that subjects' experiences of the relative contrasts of patches (in displays structurally similar to Figure 2, where the patches may differ from each other in contrast) are affected by attention. Attention to a patch increases its contrast relative to the other unattended one – e.g., when the patches are equal in contrast the attended one is experienced as higher in contrast, and when the attended patch is lower in contrast from the unattended one (for a certain amount of difference) they are experienced as similar in contrast.[15] The suggestion then, is that this is due to the effect on the signal at the early stage. Arguable this effect on the signal also explains the effect you may experience when attending covertly to one of the patches in Figure 2.

It is tempting to think that since the same increase in neural activity occurs whenever attention is covertly directed towards an object, there should also be a corresponding effect on experienced contrast. However, there is empirical evidence that when subjects view, instead of two still patches, moving stripes (within the bounds of the patches' locations – as if one is viewing the movement through a window) and covertly attend to one of the locations, there is no increase in the apparent contrasts of the stripes, but rather a slight decrease (see Turatto et al. 2007: 172). Turatto et al speculated that the reduction in contrast may be the result of

[13] I understand 'experience' as conscious.

[14] For objections to this suggestion see Beck and Schneider 2017 p.480.

[15] See, for example, Carrasco et al 2004, Cutrone et al. 2014. In the experiments, in order to ensure that the effect is indeed due to attention (e.g., ruling out an effect of eye movement) the patches are viewed for a very short time (e.g., 40 ms – i.e., milliseconds – in the 2004 study). One might raise doubts as to whether this is sufficient time for subjects to actually experience the relative contrast (see Wu 2014). I leave aside these and other types of doubts that had been raised regarding Carrasco's findings.

blurriness due to the movement.[16] What matters for our purposes, though, is not the exact explanation, but rather the demonstration of how a (presumed) effect on information-processing at an early stage can be cancelled out by other factors.[17]

It is worth mentioning that the effects of spatial and especially temporal context on the fate of more local information processed in the visual system aren't confined only to information about simple features like contrast (which are supposed to be processed at an early stage). The phenomena of visual masking and priming enable researchers to identify cases in which relatively complex visual information is processed but doesn't show up in experience. Masking occurs when a stimulus which would have been experienced had it been presented on its own, isn't experienced when it is embedded within a certain context (the mask). E.g., when a grey circle is displayed on a white screen for 40ms and the screen remains empty during the following second, subjects experience a brief appearance of a grey circle on an otherwise white screen. However, if the 40 ms display of the circle is followed by a 20 ms of white screen and then a 40 ms display of a grey ring that encircles the location at which the circle occurred, subjects experience only a brief appearance of the ring on an otherwise white screen.[18] Priming is an effect of a visual encounter with a stimulus on further performance (e.g., the speed of recognition of a similar stimulus when it is encountered again, or an effect on subjects' choice when they are shown the first few letters of a word and asked to complete it with the first word they can think of), where the subject isn't conscious of the existence of the effect. By testing the priming effects of masked stimuli, researchers attempt to find out what information from the masked stimuli (which aren't experienced consciously) has been processed. The research so far suggests, for example, that shape and category information from masked stimuli can be processed.[19] Highlighting the effect that temporal context can have on whether or not visual information shows up in experience is particularly important in this context since many of the empirical findings regarding visual attention concern modulations of visual information-processing at very fine timescales.

The focus, in experimental work, on fine timescale phenomena gives rise to a further complication. It isn't always obvious how such phenomena relate to what we ordinarily think about as phenomena of visual attention – our visually focusing on an object, say, in an attempt to recognize what kind of thing it is, our looking around the

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[16] Turatto et al. 2007: 176. To be accurate, the study in question showed an effect of attention on the experienced speed, and the speculation was that the increased speed of the attended movement resulted in increased blurriness which, in turn, explains the *decrease* in contrast (rather than merely the fact that no increase in contrast occurred).

[17] I also mentioned in §2 the difficulty regarding the generalization from an effect experienced when a specially designed display is viewed (e.g., increase in contrast between striped patches) to other types of displays. In this context it is interesting to consider whether the contrast between elements of the scene is always experienced as contrast. (Compare parallax motion, where relative movement is experienced as difference in distance). It's also interesting to note that it seems that the effect might not generalize to cases of over attention. Try to shift your attention *overtly* between the patches in Figure 2 – i.e., shift both attention and your gaze toward one patch, then the other, and so on. My (and others') experience is that the effect disappears.

[18] For a rough demonstration see https://warwick.ac.uk/fac/soc/philosophy/people/lerman/backward_masking_demo.ppsx

[19] For references see Breitmeyer 2014 Ch.5.

room in order to try to find the keys, or what we do when we attempt to shift attention covertly between the two shapes/patches in Figures 1 and 2. The former type of shifts of attention often occur 3 times per second, and we are, typically, unaware of their occurrence (at least the occurrence of each shift individually). Moreover, what we may view as focusing visual attention on an object may involve several shifts to surrounding objects, and between different aspects of the object.

Given the potential gaps between attentional modulation of information-processing and our conscious visual experience as well as the gap between fine timescale phenomena that the experimental research focuses on and what we ordinarily think of as phenomena of visual attention, it may seem that there is no point appealing to empirical work in order to learn more about the character of the effect of attention on the phenomenology. But this is an overreaction. First, the fact that the relationship between the empirical findings and the phenomenology is rather complex doesn't mean that we can't gain a better understanding of this relationship than we now have.[20] And the same holds for the relationship between the fine timescale phenomena and what we ordinarily regard as visual attentional phenomena. What it means is that we (philosophers) need to be very careful and patient when we attempt to evaluate what we can learn from given empirical findings about the phenomenology. It seems, in particular, that it would be useful to pay more attention to empirical work concerning integration of information over time and concerning higher-level visual information-processing, as well as empirical studies of (both covert and overt) attention in the natural environment. Second, it seems that, even without addressing all the issues mentioned above, empirical data can reveal constraints on what could be true about the character of the effect of attention. Thus, for example, learning how reduced attention affects information-processing (not only locally at the early stages of visual-processing but more generally) provides constraints on what could be presented in our experience of unattended or less attended objects (at the beginning of the section I mentioned such a suggestion with regard to the processing of details). Furthermore, with sufficient care we can identify selective attentional modulations which are plausibly part of what takes place when we intentionally shift attention in our test cases (e.g., cases in which we shift attention covertly and attempt to introspect the experience as we did in §2); thus such constraints could be used to support hypotheses that fit a shaky observation we make on the basis of introspection.

To summarize, I suggest that empirical findings about attentional modulation of visual information-processing can potentially help us to learn more about the effect of attention on visual phenomenology, but that drawing conclusions regarding the effect on the phenomenology from relevant empirical data is a rather complicated matter.

[20] To clarify, the suggestion is that careful experimental research and theorizing can help to clarify the general relationship between visual information-processing and conscious visual experience, and that this can be done without worrying about the character of the experience of unattended objects. Thus such general knowledge can then help us move from findings about attentional modulation of visual information-processing to hypotheses about the character of the experience of unattended or less attended objects. There are, of course, well known limitations to our ability to draw conclusive conclusions about the general relationship between information-processing and phenomenology, but this is not to say that we can't have better and worse support for particular hypotheses.

For this reason I do not offer here any specific positive claim about effects on the phenomenology that are supported by empirical findings. Still, I think the programmatic suggestion about how empirical work can provide constraints on the character of the effect of attention enables us to formulate an initial hypothesis about the sense in which the effect of attention may be described in terms of salience.

Consider the selective attentional modulation of information-processing which, plausibly, occur when we focus attention (overtly or covertly) on one object and so (to some degree) withdrawing attention from others. Such modulations result in the selection of information from the attended object rather than other information for further processing, and thus we can expect that whatever it is that further processing yields – clarity, detail, object-coherence, visual recognition – would be higher for the attended object relative to its unattended (less attended) surroundings. We can then ask whether any of these differences between the experiences of attended and unattended objects (or combinations of the differences) give us a sense in which the attended object is made salient to the subject. An initial hypothesis that doesn't seem implausible is that the experience of an object being visually more clear, coherent, and detailed than its surrounding does make the object stand out visually for the subject.[21] Furthermore, it doesn't seem unreasonable to suggest that this sense of salience of an attended object is relevant to explaining the role that visual attention to objects plays in enabling us to think about them demonstratively, to gain visual information about them and to intentionally direct visually guided actions towards them.[22]

These very general suggestions are meant to be mere hypotheses that may turn out to be wrong on more careful consideration. But let's assume for the sake of the argument that something along these lines is correct. It is still an open question whether this gives us the whole story about the kind of salience people report finding when they introspect the effect of attention in test cases. In the next section I consider an attempt to argue that it doesn't give the whole story.

4. The distinctiveness claim

A number of philosophers have recently suggested that focused visual attention has a saliency effect on the phenomenology of visual experience which is distinctive of attention, and thus cannot be fully-captured in terms of changes in appearance (where 'appearance(s)' is understood as referring to ways an experience represents or presents the environment as being).[23] I'll refer to this suggestion as 'the

[21] What about effects of the kind Carrasco has identified: attention (in some circumstances) causing an increase in experienced contrast, size, speed, etc.? Perhaps in some cases they can contribute to making the attended object stand out visually relative to its surroundings (e.g., when the relevant features of the unattended surroundings are similar to that of the attended object, as was the case in Figure 2), or perhaps the intensification just after shifting attention may have such effect. But while maintaining attention to an object whose, say, contrast is sufficiently less intense than that of its surroundings, it seems that the intensification of its contrast won't suffice for making it stand out visually.

[22] See Campbell 2002 for the claim that visual attention and the resulting saliency play these roles.

[23] It is more common to formulate the claim by using 'representational content' instead of 'appearance'. I adopt Watzl's use of 'appearance' as a way of staying neutral on whether experience

distinctiveness claim' (to simplify matters I'll understand the claim that the effect is distinctive of attention as equivalent to the claim that the effect cannot be captured in terms of appearance[24]).[25] If there is such a distinctive (saliency) effect, then, arguably it cannot be due merely to attentional modulations of visual information-processing. For presumably, attentional modulation of information-processing can only result in an effect on the appearance, since ultimately visual information-processing is understood functionally, and its function (in addition to providing information for action) is to account for the appearances. Thus, such modulations may affect whether or not aspects of the visual scene are seen; which ones are experienced as coherent objects; how detailed the presentation of each aspect is; the specificity of the properties and relations that are presented; etc.; and in addition, they may skew appearances (as when two patches of equal contrast are experienced as being different in contrast).[26,27]

What support is there for the distinctiveness claim? Proponents of the view often appeal to introspection of one's experience while one covertly shifts attention between qualitatively identical aspects of a display (e.g., the two patches in Figure 2),

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has representational content or whether the way aspects of the environment are presented as being is (partly) constituted by their mind-independent qualities. However, my characterization of 'appearance' is slightly different from Watzl's (who explains his use of 'appearance' as referring to 'the way things look to the subject when she has that experience' (2017: 160)). Neither characterization makes it clear why we can't simply say that 'being salient/prominent/central/highlighted' is itself part of the appearance. Perhaps what proponents of the view have in mind could be captured by saying that the relevant ways of experiential presenting/representing are the aspects of the experience which provide (mis)information about how things are with the relevant aspects of the environment.

[24] The effect being distinctive of attention entails that it cannot be captured in terms of appearances, but not vice versa. We can't rule out a priori the possibility that there are other aspects of visual phenomenology that can't be captured in terms of appearance – e.g., blurry vision – and which may play a role in accounting for the effect of attention. For present purposes, we can ignore this complication.

[25] Proponents of the claim include Speaks (2010), Watzl (2011, 2017), Beck and Schneider (2017). Chalmers (2010) suggests that it is potentially true, but doesn't commit to it. Note that the view I'm targeting here differs from Block's (2010), as far as I understand it. It is true that Block argues that attention has an effect on the phenomenology that cannot be explained in terms of appearance (in the sense in which the term is used here). However, it doesn't seem that the effect Block has in mind has to do with a kind of saliency that is distinctive of visual attention. In any case, even if I'm wrong about this, his view should be treated separately since his considerations are rather different in kind than those of Chalmers, Speaks and Watzl. I discuss his view elsewhere (work in progress).

[26] Beck and Schneider (2017) argue that visual attention to an object makes the object phenomenally salient, and that the salience in question cannot be explained in terms of change in appearances (furthermore, they associate the relevant sense of saliency with what Watzl considered to be the phenomenology that is distinctive of visual attention). However, some of the things they say suggest that they think that the phenomenal saliency in question is explainable in terms of attentional modulations at the level of information-processing (specifically, the fact that they talk about the neural correlate of salience, p.480, and assert that salience is a property of the visual system, p.489). There is no space here to explain why I find their suggestion problematic. What matters for present purposes, though, is that the following discussion bears on their view since it questions the basis for their claim that attention is correlated with *phenomenal* salience rather than some unconscious aspect that realizes what they call 'functional salience'.

[27] Note that for the above claim to be entirely accurate (in light of the point made in fn.24), we should either consider aspects of the phenomenology such as blurry vision to be part of the appearances, or add that attentional modulation of visual information-processing may also result in visual side-effects of the processing (which aren't specific to attention).

suggesting that such introspection reveals a phenomenological change which isn't due to any change in the apparent features.[28] Some philosophers (e.g., Speaks 2010) do so by providing a test case regarding which they argue that no change in appearance is experienced at all, others admit that some changes in appearance occur but that these changes do not exhaust the effect on the phenomenology. However, our discussion in §2 and §3 suggests that introspection on the relevant experiences simply cannot suffice for supporting such claims. First, due to the dependence of introspection on attention, we do not have a clear enough sense of what the effect of attention on the phenomenology involves. Second, the empirical data do not provide us with a straightforward way of determining the effects of attention on appearance, so we cannot hope somehow to try to subtract what we know about the effect on appearance from what we introspect. Third, since there are, at least in principle, ways in which the effect on appearance can contribute to making an attended object salient, one cannot simply assume or argue a priori that effects on appearance cannot account for the saliency effect one seems to identify introspectively (especially given the lack of clarity about the exact character of effects we notice introspectively).[29]

In his 2017 Watzl attempts to provide an argument for the distinctiveness claim. I will consider this argument in detail both because it is the only detailed attempt I know of to provide such an argument,[30] and because some of the faults of the argument seem to be common faults in philosophers' reasoning about the phenomenology of experience in general and the effect of attention on it in particular.

Before presenting the argument, there is a need for one further clarification. The distinctiveness claim was described above as saying that focused visual attention has a distinctive saliency effect – i.e., an effect that cannot be fully-captured in terms of changes in appearance – on the phenomenology of the subject's experience. Watzl, and some of the other philosophers who discuss the claim, emphasize that they are concerned with focused *subject-level* (or personal-level) visual attention. So from here on I'll understand the distinctiveness claim in this way. This, of course, raises the question of what is meant by *subject-level* visual attention. We can start by pointing out that the activity of attending counts as subject-level when it is an activity of the subject – something the subject is doing. (Note that this doesn't exclude from counting as subject-level cases in which one attends, against one's own will, to a distractive stimulus – e.g., the moving images on a monitor in the background.

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[28] For example, Chalmers (2010), Speaks (2010), Watzl (2011). Wu (2011, 2014) also suggests that such demonstrations seem to reveal an effect on the phenomenology which isn't due to changes in appearance, though he concludes that the effect isn't perceptual. It is worth noting that the example discussed by Nickel (2007), which is often treated as another example of the same effect, is different in nature since it involves an effect on the phenomenology that is mediated by a change in grouping. Such an effect isn't meant to generalize to all other cases of focused attention.

[29] A further problem with reliance on introspection in the relevant test cases is the fact that they have features that are unique to them (e.g., the fact that they involve intentional covert direction of attention, and the fact that we attempt to introspect the experience), where these aspects could mistakenly give the impression of a distinctive effect of attention on the phenomenology. I consider this problem below.

[30] The consideration used by Wu (2011) and Watzl (2011) to show that the effect of attention cannot be captured in terms of appearances *presupposes* that attention has a distinctive effect on the phenomenology.

Attending to a destructive stimulus can be something the subject does just like biting one's nails against one's own will is.[31]) Clearly, this rules out mere attentional modulations of visual information-processing from being considered as subject-level; but things become complicated when we ask whether we can assume that each (fine timescale) attentional modulation is at least a part of the activity that underlies subject-level attentional activity. For lack of space, I will ignore these complications and the potential problems they pose for Watzl.

Let's turn then to Watzl's argument for the distinctiveness claim. In order to show that focused (subject-level) visual attention has an effect on the phenomenology that goes beyond any effect it might have on the appearance, he argues as follows.[32]

Take any set of effects of attention on the appearance which may occur when a subject is experiencing a certain scene s in conditions c, while allocating attention in a certain way a. (Of specific interest to us is the case in which the subject focuses attention on only one out of a number of objects in s). The appearance – that is, the way things in the scene are presented to the subject in that experience as being – is a function of s, c, and a. Call this way w. Whatever the effects on the appearance are (that is, whatever the details of w are), there are always a scene s*, conditions c*, and a distribution of attention a* (a≠a*) which

1. replicates w – i.e, w is the way things in s* are presented to the subject in her experience when she experiences s* in c* while allocating attention in way a*. For example suppose that a subject is viewing Figure 2 (this would be the scene s), in certain conditions (c) which include fixing their gaze on the black square, while covertly shifting attention towards the right-hand patch (this would be way a). And suppose, for the sake of the argument, that as a result of the attention shift the right-hand patch appears slightly higher in contrast than the left-hand one. The claim is that the appearance w which is due to s, c, and a can be replicated by viewing a modification of Figure 2 in which the contrast (between the stripes) of the right-hand patch is higher than that of left-hand one where the difference in contrast between them is the same as the degree of the apparent difference in contrast in w (this would be s*), the conditions are the same (i.e., c*=c), and the subject attends equally to both patches (a*).
2. the phenomenology of the experience of s in c given a, differs from the phenomenology of the experience of s* in c* given a*.

If this is true (or rather, if it is true for all cases in which a is a case of a subject's focusing visual attention on a certain aspect of the scene), then visual attention has a distinctive effect on the phenomenology of the experience (though, as the argument is presented, it is a further question whether the additional effect involves making the attended aspect, in some sense, salient). However, both (1) and (2) are problematic.

[31] Roessler (2011: 278, in particular fn.6) makes this point.

[32] What follows is my way of spelling out Watzl's replicability argument (Watzl 2017: 173-4). Note that the argument is presented as an argument for the existence of some distinctive effect (not specifically a saliency effect). However, Watzl seems to assume that a saliency effect is the only candidate for being the distinctive effect of attention.

To see that (1) is problematic, consider the possibility that the effect of focussing attention on one of the objects in a given scene on the appearance involves an effect on the specificity of the experience – both with regard to how determinate or determinable apparent properties of the attended and unattended properties are (e.g., whether the object is experienced as having a very specific rectangular shape, as merely rectangular, as rectangularish, and so on), and with regard to the amount of details one experiences.[33] (As mentioned in §3 such effects are likely results of attentional modulations of information-processing). It is, however, doubtful that such effects can be replicated as required by (1). That is, it is doubtful that there is a way of adjusting the scene and conditions so that a subject who distributes their attention over the adjusted scene in the adjusted condition will have an experience with exactly the same appearance as they have while focusing attention in the original case. Watzl suggests that changes in how determinate/determinable apparent properties are can be replicated with the help of glasses that blur/focus parts of the scene. In addition one might think that lack of details can be easily replicated by erasing details from the scene (e.g., erasing pockets, buttons and creases from a shirt, or the complex structure from a piece of wood). But both suggestions seem mistaken. Consider our experience of objects in the distance. The experience is less specific than the experience of the same object from closer to. But the phenomenology, when the object is seen at the distance is nothing like simply seeing the same thing only somewhat blurred (and with missing details).[34]

It seems, then, that (1) is incorrect.[35] However, let's assume for the sake of the argument that it is correct, and consider (2).

What is the basis for (2)? Watzl starts his discussion of it by claiming that it is 'intuitively obvious' (2017: 177), and continues:

> There is an obvious phenomenal difference between focusing your visual attention on some small detail, and diffusing attention over the scene as a whole. This difference remains even if we suppose that the world appears the same in both scenarios. The relevant phenomenal difference simply doesn't seem to amount to a difference in the apparent world a subject encounters in her phenomenal experience. (2017: 177)

[33] In some but not all cases these two ways of difference in specificity overlap. Henceforth, when I talk about 'specificity' I mean to refer to both.

[34] These points have been made by Stazicker (2011: 64-5, 113-4) and Wu (in unpublished drafts). Watzl attempts to provide a general argument for the claim that a replica must always be possible (2017: 174-8). However, one of the problems with the argument is that Watzl simply ignores the fact that differences in the specificity of apparent properties are consistent with the different appearances all being veridical.

[35] To be accurate, it is incorrect given the very plausible assumption that attention can affect specificity. It may seem that (ignoring the problems with (2)) Watzl could at least use a weakened version of (1) – limited to cases in which there are no such effects – in order to show that there are cases in which attention has a distinctive effect. (Thanks to Sophie Archer for pointing out this option.) However, apart from the worry about the generality of the effect, it also seems rather unlikely (given the considerations discussed in §3) that there are cases in which focused attention doesn't have some effect on specificity (at the very least in the sense of information regarding detail).

Note, first, that Watzl isn't asking us to compare two actual experiences – the one we have when we focus attention on 'some small detail' (of a given scene in given conditions) and our experience in the relevant replica situation in which we diffuse attention over the scene. We are merely asked to *suppose* that in a replica situation the appearance (what we called w) is the same as the appearance in the focused attention situation. Furthermore, neither Watzl nor anyone else can attempt to evaluate (2) by comparing actual experiences of the relevant types (at least not given our present knowledge about the effect of attention on the appearance). For we don't know what w in the focused attention situation is, and don't know what a perfect replication should be. Take the simplified example described above (with relation to Figure 2). For the purpose of the example I assumed that the only effect on appearance due to attention was an increase in the relative apparent contrast between the patches. However, we have no good reason to assume that this is the only effect on appearance (any aspect of the patch – size, shape of the stripes, character of the blurry bit enveloping the patch, etc. – and the grey background may change in the specificity of its appearance, and there may also be further effects on apparent relative distance, etc.). Furthermore, in my description of the simplified example I only talked about what the relative contrast between the patches should be, but an actual replication requires us to determine the specific degrees of contrast of each patch in the display. This requires that we know the extent to which the appearance of each patch is affected. In addition, it is possible that an accurate replication requires that we take into account small changes in the amount of attention allocated to different aspects of the display over time – changes that occur even when we are attempting to fix attention on one patch only[36] – as these may result in (slight) changes in appearances over time.[37]

Note that one cannot simply attempt to argue that it is unlikely that any of the differences I've just mentioned would explain the effect of attention on the phenomenology, and therefore that a simplified, inaccurate replication can suffice for our purposes. The problem isn't merely that the argument promises to show that no set of changes in appearance can capture the whole effect that attention has on the phenomenology, and thus proponents of the argument can't simply presuppose that some effects on the appearance are irrelevant to capturing the full saliency effect. The further problem is that (i) introspection doesn't give us a clear sense of the character of the change in phenomenology of the test case, and (ii) at least some of the likely potential effects of attention on appearance (including some of the ones missing in the simplified example) may contribute to some sense of saliency of the object on which we focus attention. Consequently, we can't rule out that even fine differences concerning these effects on the appearance can make a difference to whether or not the phenomenology seems to us to involve the relevant sense of saliency of the relevant object.

[36] See, for example, Fiebelkorn and Kastner 2019.

[37] A further difficulty concerns the nature of what we do when we are meant to distribute attention equally over the scene or over a number of stimuli. Wu (2019: 949-50) makes a related complaint about the nature of such distribution of attention.

It is clear, then, that Watzl isn't offering an actual way of introspectively noticing, by comparing relevant actual experiences, that attention has an effect that goes beyond its effect on appearance. Returning then to the above quote, the question is: what basis is there for Watzl's claim that '[the phenomenal difference between the focused and distributed attention episodes] remains even if we suppose that the world appears the same in both scenarios.'? Since it is a claim about the phenomenology, he must rely on introspection in some actual cases. And since ordinarily we direct attention overtly – that is, together with corresponding eye movements – the relevant actual cases have to be ones in which one can be sure that attention is directed covertly, which limits the range of relevant cases to the kind of test cases we mentioned in §2.[38] It seems, then, that Watzl, like other proponents of the distinctiveness claim, is simply relying on introspection in the test cases.[39] Consequently, the discussion in §2 and §3 casts doubts on his basis for (2).

Although Watzl's argument for the distinctiveness claim doesn't advance us beyond reliance on introspection in the test cases, further examination of Watzl's discussion may help us in a different way. Since Watzl allows for the possibility that the effect of attention in the test cases is partly an effect on appearance, perhaps his discussion could point us towards aspects of the experiences in the test cases which might explain how introspection on such cases leads Watzl and others to believe that the effect on the phenomenology in those cases goes beyond the effect on the appearance.[40] There seem to be two such aspects, and in the rest of this section I will consider briefly whether any of them provide immediate support for the distinctiveness claim.

The first aspect is suggested by the last sentence in the above quote – 'The relevant phenomenal difference [between the focused and distributed attention episodes] *simply doesn't seem to amount to a difference in the apparent world* a subject encounters in her phenomenal experience' (my italics). Though this isn't what Watzl is explicitly discussing there, the sentence reminds us that the effect of attention on the phenomenology in the test cases isn't experienced as a change in the world – we aren't even slightly inclined to judge that the shapes and patches in Figures 1 and 2 have changed (as we might have been if the effect yielded an illusory experience).

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[38] Note that this restriction also means that one can't rely on what we might commonsensically think of as the phenomenology associated with visual attention. For it seems that this is inseparable from the effect of eye movement.

[39] In principle there is a further option here – that we can gain insight about the effect of attention on the phenomenology from certain exercises of the imagination. But this doesn't seem an appealing option. First, it seems implausible to suggest that such imagination can provide such insight: it was not based on relevant experiences in actual situations. Second, we have no basis for trusting such imaginations if we don't rely to some extent on the similarity between actual past experienced and imagined experiences.

[40] Watzl (2017: 177-80) offers a series of arguments in support of (2). I have various reservations about each of them (some are related to the points made so far about the quote from p.177, others to further assumptions and moves Watzl makes). What I'm doing in the text is extracting from these arguments two aspects of the test cases which seem to me most likely to give rise to the sense that the effect on the phenomenology goes beyond an effect on the appearances. What I'm interested in, though, isn't whether this *explains* why people are inclined to accept the distinctiveness claim, but rather whether this aspect can justify accepting the claim.

Thus, for example, if you experience the attended patch as becoming higher in contrast when you shift attention to it, it is most likely that you do not experience the change as a change in the contrast of any of the patches. Perhaps, then, this fact plays some role in explaining how the test cases might seem to involve a distinctive effect of attention.

It should be clear, though, that the fact that the effect of attention on the phenomenology isn't experienced as a change in the world, by itself, doesn't immediately entail that the effect on the (visual) phenomenology goes beyond the effect on appearance. First, some changes in appearance which shifts in attention can potentially cause – e.g., mere changes in specificity – do not correspond to change in the world. Thus the fact that the change in appearance doesn't appear as a change in the world doesn't mean that the effect of attention on the phenomenology goes beyond the effect on appearances.[41]

Second, in the test cases the change in appearance that is due to the shift in attention occurs during our ongoing experience, and thus our experience includes an experience of a certain change. Now, when this is the case, the specific way in which the appearance changes – e.g., whether the experience is as of an object in front of one gradually changing shape in a rather natural way, whether the experience is as of an object becoming partly occluded by another object, and so on – can make a difference to whether or not the change appears (visually) as a change in the properties of a certain object. Moreover, a change may appear as one that doesn't involve changes in the object, even when the appearance of the object after (or before) the change is, by itself, potentially misleading (with regard to the object's features).[42] E.g., watching a pound coin, which is initially facing you, slowly turning 45º, so that at the end its side is facing you, doesn't appear as a change in the coin's shape, though the appearance from the side could have misled you regarding the shape of the object you see. So again, the mere fact that the change doesn't appear as a change in the world doesn't mean that the effect of attention on the phenomenology goes beyond an effect on appearance.

The point is that there can be different types of changes in appearance which might all be described as a change from appearance A (e.g., an object being round) to appearance B (e.g., the object being an elongated rectangle), but when the change itself is experienced it (visually) appears differently – in some cases as a change in an object's qualities, in others as a change in some environmental conditions, in the subject's condition, or perhaps merely as a change that isn't experienced as a change in the object's qualities (while not experienced as being due to any other factor[43]). Cases of the latter two types may be generally described as cases of visual constancy (at least in a loose sense). And it doesn't seem implausible that such constancy is

[41] This problem is the problem that mars Watzl's attempt to argue that a replica must always be possible (mentioned in fn.322).
[42] I'm ignoring here a whole range of subtle differences between different kinds of cases. For present purposes, a very rough indication of a group of phenomena is sufficient.
[43] Think about a type of change that can be experienced when watching a magic trick which (visually) appears to involve an unexplained change in an object in clear view (or a similar effect on video).

present in cases of covert shift of attention. Consider again the experience of covertly shifting attention to the right-hand patch in Figure 2. It seems that a subject who experiences a change in contrast in this situation doesn't experience it as a change in the actual contrast of the patches. In this particular example, it seems reasonable to suggest that we have a case of the third type: it isn't part of the way the change is visually experienced that it is due to a shift in attention, the experienced change simply isn't experienced as a change in the patch. (This is, at least, how the experience strikes me.[44]) If this description of the appearance in the case in question is correct, then we have a change from the appearance of two patches of equal contrast to an appearance of the right-hand one appearing higher in contrast, while the appearance of the change isn't an appearance of a change in the actual contrast of any of the patches.[45]

When reflecting on how a certain change in appearance is (visually) experienced by us, it can be very difficult to separate the effects of what we believe and know about the situation from what is genuinely an aspect of the experience. This is especially true in what I described above as the third type of case – where the apparent change isn't experienced as being of a certain kind of change. Thus I am not ruling out the possibility that in the patches' case the appearance of the change isn't sufficient for explaining why it seems to us immediately obvious that the change isn't a change in the patches. And that the explanation requires appeal to a belief that the patches aren't changing, or to one's knowledge that one is shifting attention in the relevant manner. Note, though, that since our aim now is to identify an aspect of *the experience* in the test cases that could account for the impression that the effect of attention goes beyond its effect on appearance, this alternative construal is of interest to us only to the extent that the relevant belief/knowledge is somehow an aspect of or based on a relevant aspect of the phenomenology of the experience which isn't obviously a matter of appearance. One candidate, which seems more promising than

[44] But see the next paragraph for a qualification. Note that I'm not ruling out the possibility that, at least sometimes, other changes in appearance that are due to attention – especially changes in specificity – may, in some sense, be experienced as due to change in the direction of one's attention (in a similar manner to the way we experience difference in clarity that are due to direction of gaze).

[45] It is, of course, possible that the appearance of the patches' contrast after the change isn't, by itself, potentially misleading, and thus that even if I'm right about the change's appearance, there's a further aspect of the appearance that can explain why the apparent relative contrast (while attending) does not seem to be their real relative contrast. However, at the moment I'm focusing on the experience of the change (which is present in all the test cases) since it seems to me to play some role in accounting for the fact that we don't take the change in the test cases to be a change in the object. If there is a further aspect which isn't merely a matter of appearance and which makes it the case that even without experiencing the change the apparent relative contrast of the patches wouldn't seem to us to be their actual relative contrast, then this would be what we are looking for. But introspection doesn't offer clear candidates. (It is interesting to note that the results in Carrasco's experiments suggest – though do not conclusively show – that without an experience of the change, the effect of attention on the appearance of the patches is misleading. In the experiments subjects' attention is shifted towards the location of one of the patches just before they are made visible. At least in some of the experiments subjects were required to make an (implicit) judgement as to which of the two patches is higher in contrast, and the results show that the effect of attention yields a systematic mistake: the contrast of attended patches are judged higher than it actually is relative to the unattended patch. (See for example Ling & Carrasco 2007: 1051 where they say 'we… asked observers to report the orientation of the stimulus that was higher in contrast'.)

alternatives, is one's immediate awareness of how one is attending, which is the second (potential) aspect of the experience we'll consider.

Watzl mentions in his discussion of (2) that the phenomenological difference (between an experience in a focused attention episode and an experience in a replica episode with diffused attention) is due to the fact that in each case the subject is doing something different and the fact that she is aware of what she is doing (from the inside).[46] Now, there is no doubt that in the test cases we are very much aware of how we are directing our attention, since these are cases in which we deliberately (and with some effort) shift attention covertly to a particular object, and attempt to maintain it while we attempt to introspect the phenomenology. It also seems unquestionable that this has an effect on the overall phenomenology of our state at the time (i.e., not merely visual). But it is not at all clear that it affects *visual* phenomenology. In addition, this suggestion raises questions as to whether the effect is genuinely an effect of subject-level focused visual attention, or whether it is merely due to the awareness of how one attends. One way of pressing the latter worry is to ask whether the effect generalizes to all cases of subject-level focused visual attention. There are clear cases in which we aren't aware of shifts of our visual attention. For example, there are several situations in which we shift attention overtly about 3 times per second without being aware of doing so. So to argue that the effect generalizes, one would need to defend a view according to which focused subject-level attention is limited to cases in which we are aware of how our visual attention is directed. In addition, the relevant view would need to regard such awareness as a genuine integral part of one's visually attending, otherwise the effect of the awareness of one's focusing attention would seem similar in type to effects that the awareness of other visual exploratory activities could have on the phenomenology.

A proper discussion of these worries would require consideration of several complex issues that are beyond the scope of this paper. However, I take it that it is far from obvious whether and how the worries could be dealt with. And this is all I want to show at this point. I will, though, make a few brief comments which will highlight some of the difficulties involved in trying to address these worries.

The first worry – whether one's awareness of how one is attending affects the phenomenology of visual experience, rather than merely the overall phenomenology – raises complex issues as to whether there is a useful distinction to be drawn between the phenomenology of visual experience and other aspects of the overall phenomenology, and if so, how to draw it. But for present purposes, we can just focus on two options that seem favourable to the proponents of the distinctiveness claim. First, they could assume (like most philosophers of perception nowadays[47]) that there is a useful distinction to be drawn between the relevant aspect of the phenomenology, and that one's awareness of what one is doing forms part of what we can consider to be non-perceptual phenomenology; and argue that there are cases in which one's

[46] Watzl 2017: 179.

[47] And as I've been doing so far in this paper. For such an assumption is integral to the way in which I formulated the question pursued in the paper.

awareness of what one is doing can affect visual phenomenology, where awareness of how one is visually attending is such a case. Second, they could argue, specifically, that the phenomenology of our visual experience is a phenomenology of our active visual engagement with the environment, where this cannot be construed as a simple conjunction of a more basic visual phenomenology and awareness of relevant activities.[48]

The second suggestion seems to be in tension with attempting to argue for an effect that is distinctive of visual attention, where visual attention is treated as separable from eye movement and other bodily movement that are normally part of one's active visual engagement with the environment (e.g., moving towards an object to see it more clearly, changing the angle from which an object is viewed in order to gain more information about its shape, and so on). For the suggestion is concerned with subjects' active visual engagement with the environment as it is viewed by the subject. And it doesn't seem that, generally, subjects' awareness of this engagement can be broken down into fine components one of which is the direction of visual attention (independently of eye movement and further bodily movements). That is, the test cases are special in that they involve one's specifically aiming to shift attention covertly, but there is no corresponding element that is a separable component of every ordinary way in which we focus attention on objects during our everyday interaction with the environment.[49]

Let's turn then to the first suggestion – that one's awareness of how one is attending isn't itself an aspect of visual phenomenology but that it has an effect on it. There are two questions we should ask here. Is it reasonable to suggest that such awareness can have an effect on visual phenomenology? And if so, does the relevant effect concern the saliency of attended objects? A potential consideration which might support a positive answer to the first question is this. Awareness of conditions that affect the experience (e.g., the lighting conditions, the subject's location relative to the object) seem to be relevant to determining the character of visual phenomenology. For example, it is clear that information about one's position relative to an object is significant to how one experiences the object. It is also clear that part of the way such information affects one's visual experience is a matter of the visual-system using such information in processing information about shape, size, and so on; a use that is independent of what one is aware of. But there is room for arguing that one's awareness of one's (potentially changing) location relative to objects is integral to how the object is experienced as being. That, for example, the way an object's shape and colour are experienced from a long distance is inseparable from its being *experienced* as far away. The thought then, is that the same could be true of the effect of attention – i.e., that in addition to attention's affecting the experience by modulating information-processing, one's awareness of how one is attending can (in some cases) make it the case that the effect (or aspects of it) is experienced as an

[48] I take this to be Crowther's view in his 2010.

[49] To emphasize, the problem arises for this suggestion since the suggestion is that the awareness of one's active engagement with the environment is immediately considered to be part of visual phenomenology.

effect that is due to the way in which one is directing attention. This suggestion doesn't seem completely implausible (especially if it isn't meant to be general), but it is also not obvious that it is correct, and it is not obvious how to decide whether it is. Furthermore, it doesn't seem that this suggestion can help to support the claim that attention has a distinctive *saliency* effect on the phenomenology. For the suggestion merely says that an object one is focusing attention on may be experienced as being attended, and that changes in the way it appears may be experienced as due to changes in the focus of one's attention. This, by itself, doesn't seem to give us a sense in which an object is (visually) experienced as salient.[50] It is, of course, true that the object is singled out by the subject as the object of their attention, and it may be argued that this involves a sense in which the object is salient to the subject. But here a suggestion such as Wu's (2011, 2014) – that this sense of saliency is an aspect of non-visual phenomenology seems more plausible (unless we return to the second suggestion which seems to be in tension with the project of identifying an effect that is distinctive of visual attention, construed as independent of eye movements, etc.).[51]

As mentioned above, these sketchy comments about the prospects of appealing to the awareness of how one is attending in order to support the distinctiveness claim are only meant to point toward some of the complications one may face when attempting to address the two worries – whether such awareness affects visual phenomenology and whether it is genuinely an effect of (subject-level) visual attention. I do not take them to be sufficient for showing that the worries can't be addressed, but hopefully they help to clarify that addressing them isn't a trivial matter.

5. Conclusion

My aim in this paper was to spell out the main difficulties involved in attempting to achieve a clearer view of the effects that visual attention has on the phenomenology of visual experience, and to make some suggestions as to how we can make progress with this issue. Given the prevalence of the view that in the case of focused visual attention such an effect involves, in some sense, an increase in the saliency of the attended object, I approached this task by asking whether there is a sense in which focusing visual attention on a seen object can have a saliency effect on visual phenomenology.

We saw that introspection, by itself, cannot provide more that a very general characterization of such effects, often with limited confidence on the side of the subject. I suggested that empirical work on visual attention can provide some further clarity about the effects of attention on the phenomenology, even though the

[50] Would it support the claim that visual attention has *some* distinctive effect on visual phenomenology? Not immediately. The claim in the text is that the awareness of how one is attending has such an effect. There is still a further question whether one can argue somehow that such awareness is a constitutive aspect of subject-level focused visual attention.

[51] In addition to arguing that the effect of the subject's singling out the object is an effect on non-visual phenomenology, Wu also argues that it doesn't generalize to all cases of subject-level focused visual attention.

relationship between the empirical work and facts about the phenomenology is rather complicated. I also suggested that general considerations regarding the way in which empirical work can put constraints on what could be true about the phenomenology, and regarding the role attention plays in modulating visual processing suggest that the relevant modulation can potentially account for a sense in which an object on which attention is focused is made salient relative to its surroundings.

I then turned to consider whether we can find support for the claim that attention has a (further) distinctive saliency effect on the phenomenology – one that goes beyond an effect on appearance, and thus one that isn't merely due to attentional modulation of visual information-processing. The limitations of introspection and of what our current empirical knowledge tells us about the effect on the phenomenology, together with the fact that attentional modulation of visual information-processing might give rise to some sort of saliency effect, make appeal to introspection in the test cases seem hopeless. I therefore considered the argument by which Watzl attempts to support the distinctiveness claim, and argued that it doesn't add any support beyond the support provided by introspection on the test cases. Finally I considered two potential aspects of the experience in the test cases which might explain why someone who is aware of potential ways in which attention can affect appearances in the test cases might still hold that it has a further distinctive effect. I suggested that neither aspect immediately supports the distinctiveness claim.[52]

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