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The epistemic significance of perceptual learning

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ABSTRACT

First impressions suggest the following contrast between perception and memory: perception generates new beliefs and reasons, justification, or evidence for those beliefs; memory preserves old beliefs and reasons, justification, or evidence for those beliefs. In this paper, I argue that reflection on perceptual learning gives us reason to adopt an alternative picture on which perception plays both generative and preservative epistemic roles.

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First impressions suggest the following contrast between perception and memory: perception generates new beliefs and reasons, justification, or evidence for those beliefs; memory preserves old beliefs and reasons, justification, or evidence for those beliefs. In this paper, I'm going to sketch an alternative picture. In particular, I will argue that perception plays both generative and preservative epistemic roles.

The wedge into this topic is a view that I find attractive about how perception generates justification. According to this view if a perceptual experience immediately, *prima facie* justifies believing some proposition, then it does so in virtue of its having presentational phenomenology with respect to that proposition. For any given perceptual experience, however, there will be propositions we might believe just by taking it at face value and with respect to which it lacks presentational phenomenology. What about their justification? I suggest it partly depends on background information. This raises the question of how that information is acquired, stored, and retrieved. In many cases the answer, I will argue, is via perceptual learning. Perceptual learning

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consists in changes in how we perceptually process stimuli due to previous perceptual experience. I will review some of the psychological literature on perceptual learning and defend an interpretation of it according to which the phenomenon reveals a key preservative epistemic role for perception. Reflection on this preservative role provides a basis for responding to some challenges to views about perception's generative epistemic role that accord presentational phenomenology a central explanatory place.

Here is the plan. In (§1), I set out my preferred view of how perception generates epistemic justification and press the need for an account of how we acquire, store, and retrieve background information relevant to many beliefs based on perception. In (§2), I review some of the psychological literature on perceptual learning and defend some claims about its philosophical interpretation. In (§3), I continue the discussion of perceptual learning and turn toward addressing epistemological questions about background information raised in (§1). This concludes my case for thinking that perception plays both generative and preservative epistemic roles. In (§4), I appeal to this overall picture in responding to some worries about the view of how perception generates epistemic justification set out in (§1).

1. Perception and justification generation

Let's start with three distinctions brought to the fore in the following everyday example: you drive up to a traffic light. It visually seems to you as if it is red. It also seems to you as if you should stop. You infer that you will be late for your appointment.

The first distinction is between low-level propositions and high-level propositions.¹ The example is naturally associated with three different propositions, three different candidates for your belief in the scenario:

- (a) That is red
- (b) I should stop
- (c) I will be late for my appointment

Proposition (a) is low level, along with propositions about shape, size, orientation, and motion. Propositions (b) and (c) are high level. I will not propose a principle for drawing the distinction here. It is easy enough to

¹It is more common to talk about low and high level properties than low and high level propositions. Here I am using 'low level proposition' to mean proposition that just attributes low-level properties and 'high level proposition' to mean proposition that attributes high level properties. I am assuming that properties are presented in, or attributed by, an experience in virtue of figuring in a propositional content of that experience. I expect that the main points I am arguing in this paper can be detached from this assumption, but I will not take up that project here.

grasp via examples. For example, switching to another modality, and imagining an everyday example of speech perception, how would you classify propositions about pitch, timbre, loudness, speaker identity, meaning, and conversational relevance? I'm guessing you classified propositions about pitch, timbre, and loudness as low level and propositions about speaker identity, meaning, and conversational relevance as high level. There is some distinction, or at least some gradation, here, readily grasped even without an analysis.

The second distinction is between those propositions that are part of the content of experience – in this case your visual experience of the traffic light – and those propositions that are not part of the content of experience. Here, I am assuming that experiences do have propositional content. I think there is a phenomenon of forming a belief just by taking an experience at face value, which in some cases at least we can simply observe ourselves doing.² If you can form a belief that *p* just by taking an experience at face value, then the proposition that *p* is part of the content of that experience (cf. Brogaard 2014). It is fairly uncontroversial that (a) is part of the content of your visual experience and (c) is not part of the content of your visual experience. It is controversial whether (b) is part of the content of your visual experience (cf. Siegel 2006, 2014; Hawley and Macpherson 2011).

The third distinction is between those propositions that your experience immediately, *prima facie* justifies believing and those propositions that your experience mediately, *prima facie* justifies believing (cf. Pryor 2005). Your justification for believing that *p* is immediate just in case it isn't partly constituted by your justification for believing other propositions that support *p*. Your justification for believing that *p* is mediate just in case it is partly constituted by your justification for believing other propositions that support *p*. Your justification for believing that *p* is *prima facie* just in case it can be defeated or undermined in light of further considerations. So if your experience immediately, *prima facie* justifies believing that *p* it wholly constitutes a justification for believing that *p*, though this justification might be defeated or undermined in light of considerations that go beyond your experience. And if your experience immediately, *prima facie* justifies believing that *p* then it at most partly constitutes a justification for believing that *p*. Many philosophers would agree that your visual experience immediately, *prima facie* justifies believing (a) (cf. Pryor 2000; Huemer 2001; Tucker 2013). All

²That we can observe this in some cases does not imply that for any case in which we form a belief in response to an experience we can tell by self observation, i.e. introspection, whether we are doing so just by taking the experience at face value. If this were so then debates about the contents of experience would be easier than they in fact are.

philosophers should agree that your visual experience at best immediately, *prima facie* justifies believing (c): your justification for believing (c) is partly constituted by your justification for beliefs about the time of the appointment. It is controversial whether your visual experience immediately, *prima facie* justifies believing (b) (cf. Silins 2013).

So there are two controversies about (b). Is it part of the content of your visual experience? Does your visual experience immediately, *prima facie* justify believing it? It is natural to wonder whether these are connected in the following way: would demonstrating that (b) is part of the content of your visual experience thereby also show that your visual experience immediately, *prima facie* justifies believing (b)?

Nicholas Silins (2013, 18–19) presents what he calls the ‘face value argument’, which would count in favor of a positive answer to this question:

- (1) If your experiences have high-level contents, then you are able to form justified high-level beliefs on their basis without performing any conscious inference, and instead by taking the experiences at face value.
- (2) If you are able to form a justified belief on the basis of an experience without conscious inference, and instead by taking the experience at face value, then you have immediate justification from the experience for the belief.
- (3) So, if you have experiences with high-level contents, then you have immediate justification from them for high-level beliefs.

Silins notes a worry. Either taking an experience at face value is compatible with relying on background information or not; if it is, then premise (2) is false; if it is not, then premise (1) is controversial. His response is to weaken the conclusion he endorses to: ‘if experiences have high-level contents, *and* give us immediate justification for some beliefs, then experiences will give us immediate justification for some high-level beliefs’ (Silins 2013, 19). So in this paper, Silins seems to assume that if an experience immediately, *prima facie* justifies believing some of its content, then it will immediately, *prima facie* justify believing all of its content, including its high-level content if it has any.³

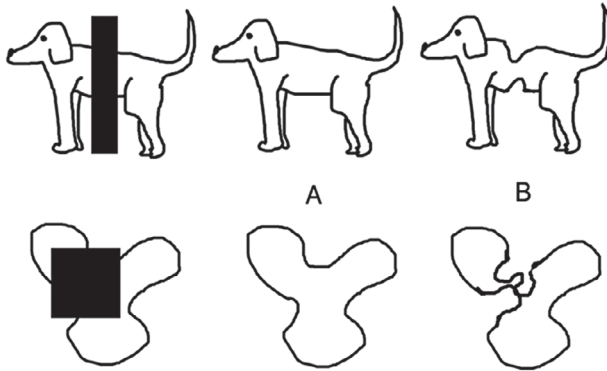
In earlier work (Chudnoff 2016) I called this assumption epistemic egalitarianism and contrasted it with an opposing view which I called epistemic elitism:

³Silins has personally communicated that in his considered judgment the assumption is false, and has pointed out other papers (Silins 2008, 2011) in which he adopts positions incompatible with it.

Epistemic Egalitarianism: If a perceptual experience immediately *prima facie* justifies believing some of its content, then it immediately *prima facie* justifies believing all of its content.

Epistemic Elitism: A perceptual experience might immediately *prima facie* justify believing some of its content, but not other of its content because of some difference between them.

I think there are reasons to endorse epistemic elitism over epistemic egalitarianism, in which case even Silins' weakened conclusion is too strong. To grasp those reasons imagine being in real world scenarios corresponding to seeing the scenes depicted in the first members of the following two sequences:



Dog and Blob

In both cases, it is part of the content of your visual experience that the seen object continues behind the bar in way A rather than way B. In the dog case your visual experience justifies believing that the dog continues in way A rather than way B. It would be unreasonable to suspend judgment about the matter. In the blob case your visual experience does not justify believing that the blob continues in way A rather than way B. It would be reasonable to suspend judgment about the matter, even if you have an excuse in case you do otherwise. The explanation for this epistemic contrast that I find most plausible is this: in both cases having justification for believing the seen object continues behind the bar in way A rather than way B depends on having background information about the type of object it is, but you only have this information in the case of the dog. Note I am not claiming that you must draw on this background information in a conscious inference. In both cases you can form a belief that the seen object continues behind the bar in way A rather than way B just by taking your perceptual experience at face value. Nonetheless, I am claiming, the justification you have for believing

that the seen object continues behind the bar in way A rather than way B is not wholly constituted by your perceptual experience.

The foregoing reasoning motivates epistemic elitism. The two visual experiences have as parts of their content propositions about both seen parts and amodally completed unseen parts. They do not immediately, *prima facie* justify believing the propositions about the amodally completed unseen parts. Plausibly, however, they do immediately, *prima facie* justify believing the propositions about the seen parts: your visual experience of the dog immediately, *prima facie* justifies believing that it has a tail and your visual experience of the blob immediately, *prima facie* justifies believing that it has a rightward protrusion. So these are experiences that immediately *prima facie* justify believing some of their content, but not other of their content because of some difference between them.

What difference might that be? On the view I prefer it is a phenomenal difference (cf. Chudnoff 2011a, 2011b, 2012, 2013, 2014, 2016). Your visual experience of the dog has presentational phenomenology with respect to the proposition that the dog has a tail in that it both represents that the dog has a tail and makes it seem as if you see a truth-maker for this proposition – i.e. the tail. It lacks presentational phenomenology with respect to the proposition that the dog continues behind the bar in way A rather than way B in that though it represents this as being so it does not make it seem as if you see a truth-maker for this proposition – i.e. the occluded middle part. Similarly, your visual experience of the blob has presentational phenomenology with respect to the proposition that the blob has a rightward protrusion in that it both represents that the blob has a rightward protrusion and makes it seem as if you see a truth-maker for this proposition – i.e. the rightward protrusion. And it lacks presentational phenomenology with respect to the proposition that the blob continues in way A rather than way B in that though it represents this as being so it does not make it seem as if you see a truth-maker for this proposition – i.e. the occluded part of the blob.

Let us return to the two controversies about proposition (b), the proposition that I should stop, in the traffic light example. On the view I am proposing, demonstrating that (b) is part of the content of your visual experience would *not*, thereby also show that your visual experience immediately, *prima facie* justifies believing (b). To show that you would have to demonstrate that your visual experience has presentational phenomenology with respect to (b). This is a much tougher prospect, and, on the face of it, rather unlikely.

To say anything general about the scope of presentational phenomenology one would have to explore the notion in much more detail than I am able to here (for that see Chudnoff 2011a, 2011b, 2012, 2013, 2016). It is

reasonable to suppose, however, that it will be rather constrained. This raises a skeptical worry. Recent work on the content of perception has encouraged many philosophers in thinking that we now have the resources to dissolve a number of traditional problems about how we know about the world around us by tracing the source of that knowledge back to some form of perceptual experience. Take the traditional problem of other minds, for example. This gets a grip on us when we start from the assumption that all we can observe about others is how they behave and then wonder how on that basis we can support claims about what is going on in their minds. Suppose, however, perceptual experiences represent others' mental states. Then it would seem that we can dissolve the traditional problem of other minds by tracing our knowledge back to perceptual experiences of others' mental states. If I am correct, however, then this is too quick. We would first need to show that propositions about others' mental states are not only perceptually represented but also associated with presentational phenomenology, since otherwise perception is at most a mediate justifier of beliefs about others' mental states and we will still have to account for the acquisition, storage, and retrieval of the background information required to supplement it (for further discussion of perceptual accounts of our knowledge of other minds and references to the relevant literature see Chudnoff 2016).

The more constrained presentational phenomenology is, the more pressing is the need for such accounts of background information. As the occlusion cases show, the problem of background information is not just a problem for high-level contents, and already arises for low-level contents. The propositions about the dog's middle and the blob's occluded part are low-level propositions, yet on the account I prefer they are still not immediately, *prima facie* justified. Without a plausible story about the acquisition, storage, and retrieval of background information the account of perceptual justification I am proposing threatens to lead to skepticism. The remainder of this paper is dedicated to sketching such a story.

2. Perceptual learning

In school you learned that $9 \times 9 = 81$. This is an example of declarative learning. You acquired some piece of information and stored it in such a way that you can retrieve it in reasoning and verbalizing. You also learned that when multiplying 99×99 you add the results of multiplying 99×9 and 99×90 , which results are themselves got by a series of steps involving multiplying, carrying, adding, etc. This is an example of procedural learning. You acquired some piece of information and stored it in such a way that you can retrieve it

in acting. You might also be able to reason about and verbally report on the procedure, but that just means you gained both procedural and declarative knowledge about long multiplication.

In addition to declarative and procedural learning, psychologists also study perceptual learning. In Eleanor Gibson's well-known definition, perceptual learning 'refers to an increase in the ability to extract information from the environment, as a result of experience and practice with stimulation coming from it' (Gibson 1969, 4) there is a large research literature on perceptual learning, focusing on a variety of questions such as: How is it implemented in the brain? What are the psychological processes that underlie it? What conditions facilitate it or inhibit it? Does perceptual learning relevant to one task transfer to other tasks? When, to what degree, and why? (Recent reviews that I have found especially helpful are Goldstone 1998; Kellman 2002; Kellman and Garrigan 2009; Kellman and Massey 2013; Watanabe and Sasaki 2015). Here, I want to focus on a question that Gibson herself emphasized, but that does not come in for much direct discussion in the recent literature: what is learned in perceptual learning?

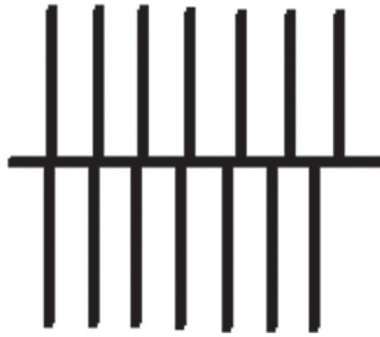
I believe that there are at least two sorts of thing learned in perceptual learning:

Abilities to detect. In some cases of perceptual learning what is learned is an ability to detect previously undetected stimulus variables. I'll call this low level perceptual learning.

Facts about diagnostics. In some cases of perceptual learning what is learned is which detected stimulus variables are diagnostic for classifications. I'll call this high level perceptual learning.

Consider a drawn circle. This is a stimulus. Its variables include features, relations, and structure, such as the feature of being closed, the relation the points on it have to each other of being equidistant to the mid-point, and the structure of consisting of a set of points equidistant to a mid-point, which is something that persists through changes in location, size, color, etc. In low-level perceptual learning one acquires a new ability. For example, training might improve your ability to distinguish circles from almost circular ellipses. In high-level perceptual learning one acquires knowledge of a new fact. For example, through training you might acquire knowledge about which variables are diagnostic for circularity. Most real world cases of perceptual learning likely involve a mixture of both learning abilities and facts, but here I will illustrate each using a relatively pure case drawn from the literature on controlled experiments.

Vernier acuity is a measure of one's ability to detect failures of alignment between line segments such as those pictured below:



Vernier Acuity

All are misaligned. This is easy to see in the right-most pairs. It is more difficult to see in the leftmost pairs. One example of perceptual learning is an increase in Vernier acuity with practice. (McKee and Westheimer 1978) found an overall improvement of 40% among their test subjects after between 2000 and 2500 trials. The phenomenon is well-studied and just one example of an improvement in a form of acuity with practice.

Improvements in Vernier acuity are an example of low-level perceptual learning. Take the leftmost line segments and imagine the following subject: before perceptual learning the leftmost line segments look to be aligned; after perceptual learning the leftmost line segments look to be misaligned. There a stimulus variable – degree of misalignment. Before perceptual learning the subject lacked the ability to detect it within a certain range of values. Likely it was represented at some stage of perceptual processing, since otherwise it is unclear how perceptual learning could get started. Where exactly is a question to be settled by more refined empirical evidence than what we are considering here. But we can say with reasonable confidence now that certain degrees of misalignment did not make a difference to the subject's perceptual experience. After perceptual learning the subject possessed the ability to detect this stimulus variable. It did come to make a difference to the subject's perceptual experience. In particular, certain degrees of misalignment came to make a difference to the content of the subject's perceptual experience. Before perceptual learning the subject's perceptual experiences of the leftmost line segments did not represent them as misaligned. That is why before perceptual learning the subject didn't report them as misaligned. After perceptual learning the subject's perceptual experiences of the leftmost line segments represents them as misaligned. That is why after perceptual learning the subject did report them as misaligned. The change in content best explains the change in judgment. Further, this is a change

in phenomenally conscious content. After perceptual learning, the leftmost line segments look different from how they looked before. The leftmost line segments now cause an experience that is phenomenally like the experience that the rightmost line segments caused all along. One aspect of this phenomenal similarity is presentational phenomenology. Consider your own experience of the rightmost line segments. It makes them seem misaligned and the experience is also felt as making you visually aware of the very gap between the segments in virtue of which they are misaligned. It is something that stands out in your visual experience and that you can point to. After perceptual learning the subject's experience of the leftmost line segments is similar: the experience is felt as making the subject visually aware of the very gap between the segments in virtue of which they are misaligned.

In a seminal study of perceptual learning (Gibson and Gibson 1955) presented subjects with the center scribble in the first picture for 5 s and then tested whether they could recognize all and only instances of it in a sequence of presented scribbles that included it as well as others – the similar ones surrounding the target in the first array and the clearly different ones in the second array (Figures 1 and 2).

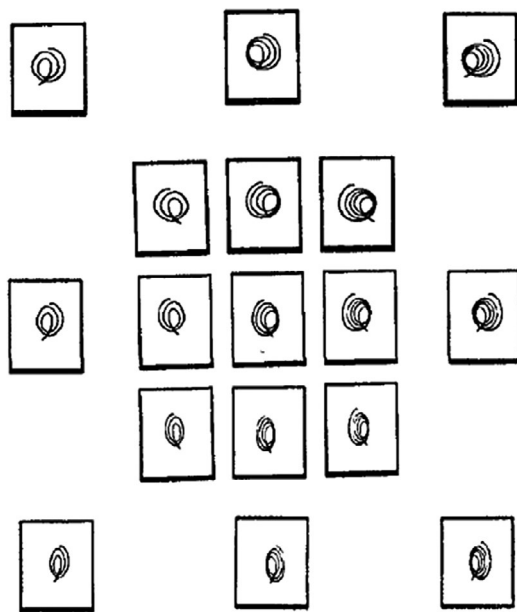


Figure 1. Nonsense items differing in three dimensions of variation. Reproduced from Gibson and Gibson (1955).

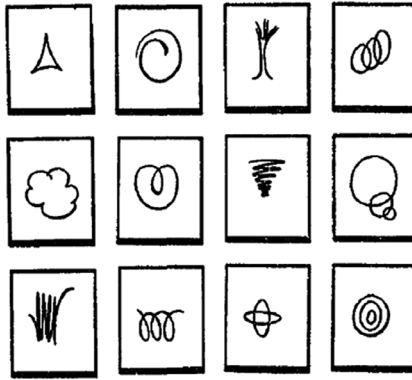


Figure 2. Nonsense items differing in many dimensions of variation. Reproduced from Gibson and Gibson (1955).

The similar surrounding scribbles differ from the target along three dimensions that are not obvious at first. One dimension is number of coils – 3, 4, or 5. Another dimension is horizontal compression or stretching. And a third dimension is orientation. The target scribble has four moderately compressed coils oriented leftward. Gibson and Gibson recorded how many trials it took for their subjects to complete the task without any errors, that is to correctly identify the target scribble when it showed up and correctly discriminate the non-target scribbles when they showed up. For adults the average was 3.1 trials, for younger children the average was 6.7, and for children between 8 ½ and 11 the average was 4.7. Though the rate of learning differed, for each class of subjects there was perceptual learning.

Consider three stimuli – the target scribble, its neighbor immediately to the right, and one of the outliers, say the scribble in the last row and last column of the second array – and imagine a typical subject. On a typical trial before perceptual learning he distinguishes the outlier from the target but not the neighbor from the target. On a typical trial after perceptual learning he distinguishes both the outlier and the neighbor from the target.

Consider the perceptual experiences the neighbor caused before and after perceptual learning. It is important to consider seeing the neighbor alone, not as presented above juxtaposed with the target and other similar scribbles. If I mask the other scribbles in the array and look at the neighbor under consideration what I see is a scribble and some of its features – e.g. its coils, compression, orientation. Presumably this is also what typical subjects in the experiment saw both before and after perceptual learning. But something did change. While, these subjects saw the features of the

neighbor that in fact distinguish it from the target scribble all along, these features did not cue the content that this seen scribble is distinct from the target scribble all along. The result of perceptual learning was to transform potential cues into actual cues. The upshot of this is a change in perceptual content. Before perceptual learning some of the subjects' experiences did not represent that the neighbor is different from the target. Plausibly, that is why they mistook the neighbor for the target. After perceptual learning the same subjects' experiences did represent that the neighbor is different from the target. Plausibly, that is why they successfully distinguished the neighbor from the target.⁴

Improvements in Gibson and Gibson scribble identification and discrimination are an example of high-level perceptual learning. All of the relevant stimulus variables were detected before and after perceptual learning: the coils, compression, and orientation were visually represented throughout. What changed is what the subjects knew about these detected stimulus variables. Before perceptual learning they did not know, in the relevant way, that the target scribble has 4 moderately compressed coils oriented leftward. After perceptual learning they did.

In general they did not acquire declarative knowledge of this fact. Gibson and Gibson encouraged their subjects to describe the scribbles. The subjects used nouns, such as 'curl' and 'spiral' as well as adjectives such as 'too thin' and 'reversed'. None were reported as giving the specific number of coils even though that is one of the three dimensions of variation. The knowledge that the target scribble has four moderately compressed coils oriented leftward was not stored in such a way that it could be retrieved in reasoning and verbalizing. Rather, it was stored in such a way that it could be retrieved in perceptual processing, leading to perceptual experiences with different contents. That is the hallmark of perceptual learning that distinguishes it from declarative or procedural learning. One could imagine a variant on the experiment in which the subjects are told that the target scribble has four moderately compressed coils oriented leftward and are then given the task Gibson and Gibson gave their subjects. A likely scenario is that in this case they would be able to report the distinguishing features of the target scribble throughout the experiment but it would still take training for them

⁴One might wonder whether what changes is how subjects attend to stimulus variables rather than which perceptual contents are cued by stimulus variables (cf. Connolly 2014). I do not have space to discuss fully this issue here. Briefly, however, I'd say there might be both changes and the changes in how subjects attend to stimulus variable might be part of the explanation of why there are changes in which perceptual contents are cued by stimulus variables. This is compatible with Connolly's specific criticisms of phenomenal contrast arguments.

to be able to complete the Gibson and Gibson task without any errors – assuming the design of the experiment ensures they do not have time to record the seen number of coils, compression, and orientation and make an inference on the basis of this information and their declarative knowledge. In this imagined variant of the experiment the subjects have declarative knowledge that the target scribble has four moderately compressed coils oriented leftward throughout, but still require training for perceptual learning of this fact to occur.

3. Perception and justification preservation

Suppose you are a subject in Gibson and Gibson's experiment, and you have gone through sufficient training to have attained the level of perceptual learning they sought to impart. Now you are looking at the neighboring scribble singled out in the previous section, i.e. the scribble immediately to the right of the target in the first array. It looks different from the target to you and this is what you judge. In particular you judge: that [demonstrating the seen scribble] is not the target. In this section, I want to sketch a picture of the structure of your justification for this judgment, one that accords perception a preservative epistemic role.

My first observation is that your visual experience of the neighbor does not have presentational phenomenology with respect to the proposition that [demonstrating the seen scribble] is not the target. So there is a difference from the improvements in Vernier acuity. Those improvements were associated with changes in the contents of experiences of certain stimuli where those contents also possessed presentational phenomenology: the misalignment of the left-most line segments came to be both represented and presented. The difference between the seen scribble and the target scribble, however, is not something that your experience makes you, or seems to make you, visually aware of, since you do not see, and do not seem to see, the target scribble, which is what's required for direct comparison.

Let's now make the following idealization. Your visual experience of the neighbor does have presentational phenomenology with respect to the proposition that that [demonstrating the seen scribble] has five moderately compressed scribbles oriented leftward. I call this an idealization because in having your visual experience you might stand to its coils as we generally do stand to the speckles on a visually experienced speckled hen (cf. Chisholm 1942). Our experiences of the speckled hen do not tell us the exact number of speckles; your experience of the neighbor might not tell you its exact number of coils. It does not follow that you do not see all the coils. You do

and that is why I am simply making an idealization here and not slipping into fiction. It would be possible to work with a more accurate characterization of your visual experience: it has presentational phenomenology with respect to the proposition that that [demonstrating the seen scribble] has moderately compressed coils there₁, there₂, there₃, there₄, and there₅ [demonstrating the appropriate coils] oriented leftward. The following discussion could be conducted in reference to this proposition, but it would make it more laborious.

Consider, then, the following three propositions:

- (a) That [demonstrating the seen scribble] is not the target.
- (b) That [demonstrating the seen scribble] has five moderately compressed coils oriented leftward.
- (c) The target has four moderately compressed coils oriented leftward.

Your visual experience represents both (a) and (b). It lacks presentational phenomenology with respect to (a); it has presentational phenomenology with respect to (b). Given the account of justification generation sketched in section 1 it follows that your visual experience immediately, *prima facie* justifies you in believing (b), but it does not immediately, *prima facie* justify you in believing (a). Still, you do judge that (a) is true, and you judge it with justification. If that is so, then plausibly it is because you have some background information that helps you bridge the gap from (b) to (a). And indeed you do. According to the account of perceptual learning sketched in Section 2 you know, in a non-declarative and non-procedural but distinctively perceptual way, that (c) is true, and (a) follows from (b) and (c).

This is where I think perception is playing a preservative epistemic role. There are different ways of understanding preservation however. Consider two formulations of the idea that memory preserves justification:

If S formed a justified belief that p at t_1 , and retains (in memory) a belief that p until t_2 , then S's belief that p is *prima facie* justified (via memory) at t_2 (Frise 2016).

If my belief p is justified on (the basis of) memory, then it is justified on the basis of my original good reasons to believe p, unless on the basis of a good reason I currently possess to believe p & I can be justified in believing p on memory, even though I am not justified in believing it on the basis of a good reason I currently possess to believe p (Schmitt 2006).

According to the first formulation memory preserves a belief's epistemic status of being justified. This formulation applies to justified beliefs but is silent about what makes them justified. According to the second formulation memory preserves a belief's epistemic status of being justified by preserving the reasons on which it is based. This formulation applies to justified beliefs

and tells us about what makes them justified, namely the preserved reasons. Neither formulation is exactly analogous to the thesis I want to defend about how perception preserves justification, though the second is closer in that it explicitly mentions preserved justifiers. Here, is the thesis I want to defend:

If you have a perceptual experience in part because you perceptually learned that *p* from some previous perceptual experiences, then your perceptual experience preserves whatever *prima facie* justification for believing *p* those previous perceptual experiences generated.

The key idea is this. Past perceptual experiences that when they occur *prima facie* justify believing that *p* still *prima facie* justify believing that *p* if they have appropriately shaped my current perceptual experiences. This formulation of the idea that perception preserves justification differs from the two formulations of the idea that memory preserves justification because it is independent of whether one believes (i.e. declaratively stores) the proposition for which one has preserved justification. Take (c) from above, for example. Plausibly this is not something you believe in a sense that requires declarative storage of information. Still you did have perceptual experiences that when they occurred *prima facie* justified believing it, even if you didn't take advantage of that justification and formed the belief. What I am suggesting is that since those perceptual experiences shape your current perceptual experience via perceptual learning the justification they provided is still available. So when you believe (a) on the basis of your perceptual experience of the neighboring scribble your justification is constituted in part by your immediate, *prima facie* justification for believing (b) and in part by your preserved, *prima facie* justification for believing (c).

I will round out the view that perception can play such a preservative epistemic role by responding to some worries.

The first worry is that the view implies we can form justified, declarative beliefs that we really can't. Take my claim that your perceptual experience of the neighboring scribble preserves your past justification for believing (c). Suppose you form a belief in (c) in response to this experience, that is, you come to believe that the target has four moderately compressed coils oriented leftward. Is it thereby justified? Plausibly no, since (c) is not part of the content of your experience. But it might appear that my view implies that it is. This is a mistake, however. I claim you still have justification for believing (c) and you have it because of the nature of your perceptual experience of the neighboring scribble. But it does not follow that you can base a belief in (c) on that perceptual experience, certainly not just by taking the experience at face value, precisely because (c) is not part of its content. The justification you have for believing (c) can partly constitute your justification for believing

other propositions, such as those part of the content of your experience of the neighboring scribble, but for all that implies it might be unavailable as a basis for forming a justified belief in (c) itself.

The second worry puts two thoughts together. First, information that is stored sub-personally cannot partly constitute the justification you have for forming a belief – it is not something on which you, the person, might base a belief (cf. Lyons 2016). Second, when you perceptually learn that p – say that the target has four moderately compressed coils oriented leftward – the proposition that p is stored sub-personally (Brogaard 2016b). The implication, then, is that the information that (c) cannot partly constitute your justification for believing (a). I will not challenge the first thought here. It seems plausible to me. But I doubt the second, and even if it is correct the implication does not challenge anything that I have claimed. Say you have perceptually learned that the target has 4 moderately compressed coils oriented leftward. Your possession of this information does not manifest itself in changes in the course of your reasoning or in the contents of your speech. That means it is not stored as declarative knowledge. But not all personal level information is stored as declarative knowledge. Some of it is stored in the manner appropriate to perceptual learning. So your possession of the bit of information under consideration primarily manifests itself in changes in the contents of your perceptual experiences of stimuli. One might worry that this is not a matter of you doing anything with the information, but rather you benefiting from some part of you doing something with the information. So consider that your possession of perceptually learned information can also manifest itself in some of your intentional activities such as imagining and drawing, or perhaps molding clay in the intriguing case of chicken sexers (Biederman and Shiffrar 1987).⁵ Suppose, however, perceptually learned information really is stored sub-personally, and it follows that the information that (c) cannot partly constitute your justification for believing (a). That is compatible with what I have claimed. My claim is that because you possess – or, for the sake of argument, a part of you possesses – the information that (c) in the way characteristic of perceptual learning *your past experiences justifying (c)* continue to do so. It is the past experiences that I am claiming are still justifiers, not the state in which you store the information that (c).

The third worry is that experiences from your past cannot now be justifiers on which you might base a belief. As stated this isn't so much a worry as a

⁵This is an empirical conjecture on my part. An experiment testing it is easy enough to design, and I'd be very interested in the results.

denial of part of the view I have been defending. We need some reasons to think that experiences from your past cannot now be justifiers on which you might base a belief.⁶ Consider, then, two cases:

Case 1: Smith has gone through Gibson and Gibson's experiment and perceptually learned that (c). Looking at the neighboring scribble it seems to Smith that it is different from the target. He judges that this is so.

Case 2: Smith* is a Davidsonian swampman that has just popped into existence and is a physical duplicate of Smith. Looking at the neighboring scribble it seems to Smith* that it is different from the target. He judges that this is so.

On the view I have defended Smith's judgment is justified because of his current experience and his past experiences justifying (c), but Smith*'s judgment is not justified because his current experience falls short and he has no past experiences justifying (c). If one thinks that Smith*'s judgment is as justified as Smith's, then one should reject the view that I have defended. But it is an open question whether Smith*'s judgment is as justified as Smith's, and I do not think that the claim that it is can be appealed to in an argument against the view that I have defended without a searching investigation into its foundations, which reach into two intersecting debates in the current literature. One debate is about various forms of access internalism, the idea that subjects have special access to the epistemic status of their beliefs or candidates for their beliefs (cf. Alston 1989; Goldman 1999; BonJour and Sosa 2003). Another debate is about various forms of time-slice epistemology, the idea that the epistemic status of one's beliefs or candidates for one's beliefs supervenes on one's current mental states (Barnett 2015; Hedden 2015; Moss 2015; Weatherson 2015). The view I am defending is incompatible with *some* forms of access internalism and *some* forms of time-slice epistemology, but not *all* forms of access internalism and not *all* forms of time-slice epistemology. I am inclined to think that insofar as there is an incompatibility the fault lies with implausibly extreme developments of otherwise sound access internalist and time-slice epistemologist ideas, but defending this claim lies beyond the scope of the present paper.

The fourth worry is that the view I have defended has too limited an area of application to be of much interest. It is easy to characterize the artificial stimuli in Gibson and Gibson's experiment. But this is not the case for many of the stimuli we ordinarily learn about through perceptual experience. Consider any familiar face, for example, which you are easily as adept at recognizing as the subjects in Gibson and Gibson's experiment became with

⁶For a forceful set of relevant arguments targeting preservative views of memory, one of which is analogous to the argument from cases considered below, see Frise 2016.

respect to the target scribble. There is no simple proposition analogous to (c) characterizing such a face. So one might worry that there is no proposition that plays the role in recognizing the familiar face that I claim (c) plays in recognizing the target scribble. This is a mistake, however. The simplicity of (c) does not do any work in the account I have given. It does not matter if the proposition characterizing a familiar face is one that defies simple articulation, or even any discursive, i.e. non-demonstrative-involving, articulation in our available systems of representation. Nothing in my account hinges on there being an explicit representation of (c). So the scope of applicability of my account is not limited by our being able to explicitly represent propositions that play the role I claim (c) plays in recognizing the target scribble.

A fifth worry is that the view I have defended violates a plausible constraint on inferential justification. The plausible constraint is what (Boghossian 2014) calls the taking condition:

(Taking Condition): Inferring necessarily involves the thinker *taking* his premises to support his conclusion and drawing his conclusion *because* of that fact.

Again, consider your judgment (a) that [demonstrating the seen scribble] is not the target. I claim your justification is partly constituted by your current perceptual experience justifying (b) that [demonstrating the seen scribble] has five moderately compressed coils oriented leftward and partly constituted by your past perceptual experiences justifying (c) the target has 4 moderately compressed coils oriented leftward. You do not, however, take (b) and (c), or the past experiences justifying (c), to support (a), and so do not judge (a) because of that fact. Does my view therefore violate the taking condition? No the taking condition is a condition on inferential justification, which is just one species of mediate justification. I claim that your justification for believing (a) is mediated by your justification for believing (b) and (c). I am not claiming that you infer (a) from (b), (c), or anything else. You form your judgment just by taking your experience as of (a) being the case at face value. It is a perceptual judgment, albeit a immediately justified one, not an inferential judgment. The concept of mediate non-inferential justification is familiar from the literature on coherentism (Sellars 1956; BonJour 1985). Justification by coherence is mediate but non-inferential. My claim is that some beliefs justified by taking an experience at face value are also mediate but non-inferential.

4. Perception and justification generation revisited

In the first section of this paper, I defended the general epistemic elitist thesis that a perceptual experience might immediately *prima facie* justify believing

some of its content, but not other of its content because of some difference between them. And I sketched a specific version of epistemic elitism according to which perceptual experiences immediately, *prima facie* justify believing only those select propositions with respect to which they have presentational phenomenology. In a series of recent publications (Brogaard 2016a, 2016c) has endorsed the general epistemic elitist thesis, but criticized my specific version of epistemic elitism.

Here is a representative argument:

Chudnoff's proposal, however, runs into trouble with respect to experiences of what is said by sound sequences. The trouble is that auditory sequences give rise to the illusion of auditorily experienced meanings that appear to be evidence insensitive in just the same way as lower level visual illusions. YouTube booms with videos of cats and dogs who allegedly can say adorable things such as 'I love you'. The experience that the cat or dog said I love you is remarkably resistant to any defeaters, and there are plenty. We all know that most of these video recordings are recordings of sounds that happen to resemble the sounds of an utterance of 'I love you'. ... The fact that auditory appearances of what was said also possess this mark [evidence insensitivity] suggests that this type of auditory appearance may be the kind of appearance that can confer immediate justification on belief. Yet appearances of what was said by an utterance do not possess a presentational phenomenology, in Chudnoff's sense. (Brogaard 2016a, 9–10)

By 'evidence insensitivity' Brogaard means the kind of persistence in the face of countervailing information illustrated by cases of known illusion, such as the case in which Muller–Lyer lines continue to look different in length even though you know that they are the same in length. Her reasoning seems to be this: because perceptual experiences representing utterance meaning are evidence insensitive they immediately, *prima facie* justify beliefs about utterance meaning, but they do not have presentational phenomenology with respect to propositions about utterance meaning, so it is false that perceptual experiences immediately, *prima facie* justify believing only those select propositions with respect to which they have presentational phenomenology.

Let's concede for the sake of argument that perceptual experiences representing utterance meaning are evidence insensitive, but that they lack presentational phenomenology with respect to propositions about utterance meaning. The point in Brogaard's reasoning that I would resist is the assumption that if a perceptual experience is evidence insensitive with respect to a content then it immediately, *prima facie* justifies believing that content. Consider deep seated biases or unfounded emotional evaluations. Deep seated biases might be evidence insensitive, but they do not immediately, *prima facie* justify believing their contents. Unfounded emotional

evaluations might be evidence insensitive, but they do not immediately, *prima facie* justify believing their contents. Suppose, for example, that someone is afraid of dogs. Walking past a park in which a cheerful cocker spaniel is gleefully playing with some children this person experiences intense anxiety and fear representing the dog as a threat. The experience persists in the face of evidence against its evaluative content. One *might* claim that just because of this it does immediately, *prima facie* justify believing that the cocker spaniel is a threat, though that justification is defeated by countervailing information. But this strikes me as implausible. What might this person point to in his or her experience as supporting the claim that the cocker spaniel is a threat? There is just the unfounded emotion. It seems more plausible to me to claim that the experience does not immediately, *prima facie* justify believing that the cocker spaniel is a threat, and the evidence insensitivity with respect to this content is epistemically irrelevant. Here, is an alternative scenario for comparison. Someone walks past a park in which a tough looking German Shepherd starts barking and running toward them. This person experiences intense anxiety and fear representing the dog as a threat. But as he turns around to run, getting a wider view of his surroundings, he realizes that he has stepped into a movie set, that the dog is an actor, and that it was not running toward him, but being filmed running toward another actor who was standing behind him. In *this* case it is more plausible to say that there was *prima facie* but ultimately defeated justification for believing the German Shepherd was a threat. I bracket the question of whether the justification is immediate (cf. Brogaard and Elijah 2016).

What follows if we deny that perceptual experiences representing utterance meaning immediately, *prima facie* justify believing propositions about utterance meaning? It can be tempting to draw two consequences. First, we must accept an inferential view of our knowledge of utterance meaning. On this picture perceptual experience justifies beliefs about noises and gestures, and on the basis of this information and supplementary premises we draw conclusions about utterance meaning. So a second consequence is that we must attribute to competent speakers and hearers of a language a substantial body of justified, declarative beliefs supplying these supplementary premises. But neither consequence follows. Just as I've suggested happens with Gibson and Gibson's trained subject's beliefs about the neighboring scribble, beliefs about utterance meaning can be non-inferential though mediated by background information. We might form such beliefs just by taking our perceptual experiences as of utterance meaning at face value. Further, just as I've emphasized in the case of (c), the claim that the target

has four moderately compressed coils oriented leftward, there is no need to attribute to competent speakers and hearers of a language any particular body of justified, declarative beliefs. I am not committed either way, but for all I have said here competent speakers and hearers might just have perceptual systems that are so shaped by previous experiences of the language that those past experiences can partly constitute their current justification for beliefs about utterance meaning.

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