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Cognitive penetration and the perception of art

Dustin Stokes
University of Utah
dustin.stokes@utah.edu

Abstract

There are good, even if inconclusive reasons to think that cognitive penetration of perception occurs: that cognitive states like belief causally affect, in a relatively direct way, the contents of perceptual experience. The supposed importance of—indeed as it is suggested here, what is *definitive of*—this possible phenomenon is that it would result in important epistemic and scientific consequences. One interesting and intuitive consequence entirely unremarked in the extant literature concerns the perception of art. Intuition has it that knowledge about art changes how one aesthetically evaluates artworks. A profound explanation of this intuitive fact is that perceptual experiences vary with artistic expertise. Cognitive penetration provides an explanatory mechanism for this latter effect. What one knows or otherwise thinks about art may affect, in one of two ways sketched below, how one perceives art. Differences in aesthetic evaluation may follow, either because high-level aesthetic properties can be perceptually represented or because they causally depend on low-level perceptible properties. All of this lends credence to the hypothesis that the expert better judges art because she better perceives art. And she better perceives art because she better knows art.

Are there instances where two perceivers, by virtue of distinct background beliefs or other cognitive states, visually perceive the same object as distinct, say, in size or colour? And can this causal effect occur fairly directly: unmediated by overt bodily actions or shifts in attention? If such a phenomenon is possible then perception is *cognitively penetrable*. If not, then although cognition might indirectly influence how we perceive, perception is *cognitively impenetrable*.

Such a phenomenon would have important philosophical and scientific consequences. The following three consequences are standardly discussed in recent literature in philosophy of mind and cognitive science. If perception is affected by background

cognitive states, then it may be ill-suited as a mechanism for providing knowledge: if a belief *B* causally influences a perceptual experience *E*, and *E* then causes and is taken as a reason for a belief with the same content as *B*, then the etiology of the second belief is viciously circular. More narrowly, if perception is biased by theoretical belief, then perceptual observation will not serve as a rational basis for choosing between scientific theories. Finally, the cognitive penetration of perception is incompatible with any strong form of the modularity of mind. So any empirical evidence for cognitive penetration is evidence against modularity.

A common sense intuition says that how one sees or hears or otherwise perceives artworks is pervasively affected by what one knows, believes, and values about artworks. The question of cognitive penetrability, quite obviously, connects with the relevant traditional questions in philosophical aesthetics: how are experiences of, and consequent judgements about, artworks affected by artistic and aesthetic expertise? Does the expert make the aesthetic judgments she does (and, arguably, better evaluate the work) because she has a perceptual experience of the artwork distinct from the non-expert, *and* does she have a distinct experience because (as a direct causal consequence) of her artistic expertise?¹ In spite of having intuition on its side, the claim that expertise may influence—penetrate—perceptual experience of art has gone entirely unremarked in current literature on cognitive penetration. This paper attempts to go some way towards filling this gap.

§I provides a bit more background on the phenomenon of cognitive penetration, and suggests a working, debate-neutral characterization of the phenomenon. §II provides the relevant background from analytic philosophical aesthetics. §III takes up the task of providing some psychological mechanisms for the influence of expertise on experience of artworks. Two (non-exclusive) sketches are given. §IV further clarifies these sketches, and the general account, by defending against a few worries. It also provides much needed

¹ Here and below, ‘expertise’ and ‘expert knowledge’ are used as catch-all terms for artistic concepts, beliefs, and any other cognitive states or processes that have art-relevant content. Moreover, ‘expertise’ in this usage admits of degree. Even a novice will have some sophisticated beliefs or artistic concepts and so will, to that limited degree, have some expertise.

analysis of the temporal dimension of cognitive penetration, and of the role of attention in cognitive effects on perception.

There are a number of agendas here. First, if one is already sympathetic to the claim that cognitive penetration occurs, then one will think it plausible that the phenomenon occurs in the perception of artworks. This paper takes a first step at characterizing a particular and potentially distinctive form of the phenomenon. Second, this provides a service to philosophical aesthetics: a plausible psychological story about how artistic expertise may influence experience of artworks. This in turn lends additional plausibility to historical-contextual theories about norms of art appreciation. Finally, for critics of cognitive penetrability, consideration of the possible phenomenon in artistic contexts may provide a new opportunity for persuasion. An emphasis on artworks, as perceptible artefacts imbued with intention and cultural relevance, provides unique insight into thinking about cognition and its effects on perception.

I. Cognitive penetration of perception

The empiricist tradition typically assumes that perception is unbiased by background beliefs, desires, and goals.² This is for good reason: perception is supposed to provide knowledge, whether this be of the everyday or of the scientific sort. We see and we know; we observe and we formulate and choose theories. For these epistemic practices to be rational, perception must provide accurate unbiased information about the world. Empiricists assumed that it does precisely this. This assumption came under fire in the middle of the 20th century, both from New Look psychologists and philosophers of science like N.R. Hanson and Thomas Kuhn.³ These theorists maintained that perception was largely continuous with cognition, and in a way that problematized the empiricist assumptions. A few decades later, this tenet of empiricism was rescued from these charges, perhaps unintentionally, by the modularity theory of mind, which characterized the mind as composed of computationally

² Throughout this discussion, ‘perception’ denotes phenomenally conscious, perceptual experience. This is standard in the current philosophical literature on the topic, and so will be assumed here without argument.

³ Jerome Bruner led New Look psychology. See Bruner 1957 for a summary. Charges of theory-ladenness of perceptual observation were made by Hanson 1958, 1969; Kuhn 1962; Feyerabend 1962.

discrete and autonomous systems. Included among these systems were perceptual systems, which were supposed to be *informationally encapsulated* from cognitive systems.⁴ Thus according to modularity theory perception is cognitively impenetrable. Perceptual systems—for instance, the visual module—are hard-wired, fast, and reliable. And being hard-wired—fixed biological features of the organism—helps to explain the latter two features of perception. As Fodor puts it, “isolation of perceptual analysis from certain effects of background belief and set... has implications for both the *speed* and *objectivity* of perceptual integration” (Fodor 1983: 43; emphasis added). Most recently, things have come full circle once again, and a number of philosophers have argued, on largely empirical grounds, that perception is cognitively penetrable.⁵

One reasonable question to ask is whether theorists today, on both sides of the debate, mean the same thing by ‘cognitive penetration.’ Here is a hunch: they do mean the same thing, but the distinct definitions they offer fail to capture the unified meaning.⁶ And a suggestion: what *does* unify is instead the alleged consequences of the phenomenon. Common to both sides is a concern about a potential cognitive-perceptual relation that implies important epistemic and/or scientific consequences. Put simply, all parties are interested in whether there is some such cognitive-perceptual relation that implies important consequences for: the role of perception in enabling rational theory choice *or* the general knowledge-providing role of perception *or* a modular architecture of the mind (in particular, perceptual systems). This suggests a debate-neutral strategy: characterize (if not define) ‘cognitive penetration’ in a way significantly constrained by these consequences.

The basic thought behind this consequentialist constraint on analyses of cognitive penetration is that when one asks whether a mental phenomenon is cognitive penetration, one is asking whether the phenomenon involves a cognitive-perceptual relation that implies consequences for one or more of the listed consequences, namely, theory-ladenness or the

⁴ Fodor 1983, 1984, 1985, 1988. See also Pylyshyn 1980; 1984; 1999.

⁵ Some recent examples: Churchland 1988; Lyons 2011; Macpherson 2012; Siegel 2011, 2013A; Stokes 2012, 2013; Wu 2013; Briscoe forthcoming. For lack of a better term, call any such theorist—one who maintains that cognitive penetration does sometimes occur—a ‘cognitive penetrability theorist’.

⁶ Examples of distinct definitions/conditions include Pylyshyn 1980, 1984, 1999; Siegel 2011; Macpherson 2012; Stokes 2012, 2013; Wu 2013.

general epistemic role of perception or modular architectures of the mind. This approach prioritizes the consequences of cognitive penetration in a way sensitive to both sides of the debate. Moreover, it leaves open the possibility that there is a, perhaps disjoint, cluster of phenomena that are of relevant interest (if, for example, distinct cognitive-perceptual relations imply distinct consequences).

This brief characterization of cognitive penetration is not meant to be an operationalist one. Data from neuroscience, behavioural and cognitive psychology, and personal introspection are not readily or easily “checked” vis-à-vis the consequences in question. Instead, any such data is to be analysed in light of various proposed alternative explanations. These explanations are typically understood as *alternatives* in the sense that if any of them best explains the data, then the phenomenon in question is not cognitive penetration. And on the present proposal, these explanations are alternatives *to* an explanation that implies one or more of the relevant consequences. Inverting this, any phenomenon that implies one or more of the consequences will not be well explained by any of those alternative interpretations. So one proceeds abductively by asking, of a phenomenon or set of data, is this best explained as implying one or more of the relevant consequences or in some alternative way? Here are the alternatives.

Consider a hypothetical experiment. A subject S is primed with either an image of a toy pony or an image of a toy soldier for 500ms. After the prime is removed, S views an ambiguous inkblot (call this *a*) for 3s. *a* is then removed and S is forced with a choice: Was the image, *a*, something girls like or something boys like? Suppose that the results are significant: when S is primed with a toy pony, she far more frequently reports that *a* is something girls like. And vice versa for the alternative prime and choice.⁷ Maybe this is cognitive penetration: one’s beliefs about toy ponies and girls, and toy soldiers and boys,

⁷ This is just an illustration. However, very similar experiments have been done on racial prejudice. Payne (2001) found that when primed with an image of an African American face, subjects of varying ethnicities are far more likely to *mis*-identify an unambiguous image of a tool as a gun. The results are robust, and astonishingly persistent (e.g. the effect persists even when experimenters alert the subjects of the biasing effect beforehand).

influences how the ambiguous image is perceptually experienced. But the critic may reasonably reply with any of the following alternatives.

The *memory interpretation* maintains that all normal subjects have the same perceptual experience of *a*, no matter the prime. And since the report is made after *a* is removed, one remembers her experience as being a certain way (biased towards the prime). Or the *judgement interpretation* maintains that, like the last interpretation, experience is static across subjects. But again because the report is made post-perception of *a*, at most we have evidence that the subject has made a biased judgement about *a*. Both of these interpretations maintain that we only have evidence of cognition affecting cognition, and this is uncontroversial.

Third, the *attention-shift interpretation* claims that the data only show that the prime guided active attention: the subject looked at distinct parts of *a* depending upon the prime. This, the critic urges, is no different in kind from a case where belief or desire guide an action, which then results in a particular experience. For example, my desire to see the sunset and belief about its location may cause me to act (to walk to my office window) and, consequently, have a visual experience of the sunset. Here the visual experience causally depends upon the cognitive states. But this is a relatively banal phenomenon, and cognitive penetration is supposed to be importantly consequential and, accordingly, controversial.

Finally, some alleged evidence for cognitive penetration has been resisted by an *intra-perceptual interpretation*. Suppose that the experiment was slightly different, and the primes were images of either food items or of automobile parts, while the target stimuli were largely ambiguous figures, but with partially disguised, embedded food items. And suppose that when primed with food items, subjects more readily identify the embedded food items in the targets, enjoying a kind of pop-out effect. In this case an effect on perception may be an evolved or developed one, explained by changes in the perceptual system itself. Thus there might be broad evolutionary reasons for perceptual systems to be more sensitive to, say, food items, and the relevant primes just exploit this natural feature of perception. Or this could be a feature of normal perceptual development, where perceptual sensitivity to certain perceptible kinds is enhanced as the perceiver gains more perceptual experience of the world.

Either way, a phenomenon interpreted this way would not be cognitive penetration, simply for lack of a *cognitive* penetrator.

Because the results of the hypothetical experiment(s) are open to these alternative interpretations, the data would not provide good evidence for cognitive penetration. An effect on memory or judgement bears neither of the epistemic consequences, nor a consequence for the modularity of perceptual systems. If attention mediates the relation between background cognitive states and resultant experience—by causing or involving an overt shift or an action—then, again, no relevant consequences follow. And finally, if an effect is simply an evolved or developed feature of perceptual systems, with no influencing cognitive state(s), then both the epistemic roles and modularity of perception may remain intact. This makes clear the virtue of the consequentialist approach: both sides of the debate should agree that if a phenomenon is explained in one of these alternative ways, it is not cognitive penetration; and if the phenomenon is explained in a way that clearly implies one relevant consequence or more (and so it is not well-explained by any of these alternatives), then it is cognitive penetration.⁸

Now for the disappointing admission: there is no *conclusive* evidence for instances of cognitive penetration (understood consequentially, as outlined above; or understood in any of the ways given by extant essential definitions). But this is for reasons intimated: current scientific understanding of the mind simply does not allow a demonstrative inference to the fact that cognition directly affects perception in relevantly consequential ways. Again, the inference structure must be abductive, where one considers the data in the light of a cognitive penetration interpretation (understood consequentially) against all other alternative interpretations. The most promising methodology for isolating a phenomenon best explained as cognitive penetration involves something very much like what Susanna Siegel (2007) calls ‘the method of phenomenal contrast’. The methodology, *broadly* construed, is simple: consider a pair of perceptual phenomena that contrast in some important way (two

⁸ For simplicity, this is to apply the consequentialist constraint in a very straightforward manner, but of course it could be applied in more nuanced ways. See Stokes, forthcoming B. See also Raftopoulos 2001, who embraces an epistemic consequence as the sole criterion for cognitive penetration.

perceptual experiences with apparently contrasting phenomenal character, two contrasting perceptual reports, two distinct actions in response to the same perceptible stimulus) and then infer to some hypothesis about perception on the basis of its best explaining the contrast.⁹

A particular kind of contrast methodology involves what some have called *online perceptual tasks*.¹⁰ Here subjects typically have a target stimuli (e.g. a circle containing a valenced or non-valenced image on a computer screen) that is supposed to be matched in some way to some simultaneous report stimuli (e.g. one is to match a co-present report circle in size to the target circle). The contrast is between pairs of control and experimental subjects, where subjects are somehow primed or presented (with target stimuli) differently and this results in some important difference as recorded by the resulting data (e.g. significant differences in the reported size of the identically sized target circle). This methodology is promising because the simultaneous presentation of target and report stimuli renders the memory and judgement interpretations less straightforwardly applicable; the proximity of target and report, plus the similarities between control and experimental subjects render the attention-shift interpretation less applicable; and at least in many cases the kinds of stimuli used (for experimental subjects) seem inappropriate for the intra-perceptual interpretation.

So although there may not be conclusive methods to test for cognitive penetration, there are some good and well-defended methods of interpreting and, in some case, designing experimental studies.¹¹ The contrast method, and the more particular online matching method, will be used and thus further clarified in §III below, both with respect to

⁹ Siegel's primary interest here is phenomenal contrast as a method for identifying the contents of experience. As she clarifies, it is a method of *testing* not *generating* hypotheses. Thus one starts with an hypothesis and then identifies a relevant contrasting pair of perceptual phenomena and asks if the hypothesis best explains that contrast. See Siegel (2007) for a defence of this method, and for an array of examples of its use in current philosophy of mind and perception.

¹⁰ See Stokes (2013) for examples, discussion, and defence of this methodology.

¹¹ Research recently discussed by philosophers (see fn. 5 and 6) as plausibly interpreted as cognitive penetration includes Balcetis and Dunning 2006, 2010; Bruner and Goodman 1947; Bruner and Postman 1948; Bruner, Postman, and Rodrigues 1951; Bruner and Rodrigues 1953; Delk and Filebaum 1965; van Ulzen et al 2008; Hansen et al. 2006; Olkkonen et al 2008; Payne 2001; Witzel et al 2011.

hypothetical and experimental cases. The consequentialist understanding of cognitive penetration will be assumed for the remainder of the paper.

II. *Knowledge, expertise, and aesthetic experience*

Art critics like John Ruskin (1843) claimed that the role of the critic, and the goal of the audience, is to restore the “innocent eye”. Perceptual experience of works should be devoid of influences from artistic beliefs, knowledge, and preferences. This claim may be motivated by a kind of *formalism* that claims that works are to be appreciated and valued merely on the basis of their perceptible properties. Information concerning the creator or creation or broader context of the work, then, are not to bear on one’s best evaluation of the work. If this is right, then the non-aesthetic properties of a work—say, the colours and shapes of a painting—and the aesthetic properties—say it’s being balanced and graceful—are all *in* the work as presented, say, in the gallery. Accordingly, an eye infused with considerations of facts external to the work hinders the capacity of the individual to properly perceive the work itself and, accordingly, to best appreciate and evaluate the work.

Kendall Walton (1970) took the above kind of formalism as his foil.¹² His general claim was that art-historical facts do *and* should influence how we evaluate artworks. This *historical-contextualist* theory of appreciation divides into a descriptive and a normative claim, and can provide a frame for the present discussion.¹³ Categories of art can be more or less precise: one can perceive an artwork under the category ‘PAINTING’ or ‘ABSTRACT

¹² Walton was not the first critic of this kind of formalism. For example, E.H. Gombrich (1961) famously argued that the innocent eye is a myth, claiming instead that perceptual experience of pictures, and other types of artwork, are heavily influenced by conventional, art-conceptual repertoire. Gombrich’s critique was explicitly driven by an array of current philosophical and psychological theorizing about perception and knowledge, including Karl Popper’s work on scientific method (Popper 1959), the perceptual psychologies of Jerome Bruner (see fn. 11), J.J. Gibson (1950), and F.A. Hayek (1952), and the psychoanalytic theories of Ernst Kris (1952).

¹³ To be clear, what follows is a one interpretation of Walton’s 1970 analysis. However, there are other possible interpretations (for example, see Laetz 2010). Nonetheless, the goal here is not to attempt textual interpretation of or critical commentary on Walton’s work. Instead, one interpretation of Walton’s account is adopted (and, so, assumed) as a useful way to frame the discussion of expertise and the perception of art. No commitment to Walton’s general theories of art appreciation is made beyond this. And if one rejects that this as an interpretation *of* Walton, then think of the historical-contextualist account given here as “Neo-Waltonian” or “Walton-Sibleyian” or something of the like.

EXPRESSIONISM' or 'IN THE STYLE OF ROTHKO'S MULTIFORMS'. Because different perceptible features are *standard*, *variable*, and *contra-standard* relative to a category and a perceiver, the perceptual experience of a work can be profoundly affected by the category under which the work is perceived. For example, standard features for each of the above categories would be flatness, variable would be colour, contra-standard would be protruding 3D objects. But there are important differences among even these three categories. For example, standard for 'IN THE STYLE OF ROTHKO'S MULTIFORMS' are rough geometric shapes, while this would be a variable feature for the other two mentioned categories. Plausibly, aesthetic reaction causally depends upon perceptual experience (at least partially, whatever else it may depend on). Therefore, differences in the perceptual experience of a work can make for differences in aesthetic reaction to the work.¹⁴

To see this last point, consider Walton's hypothetical case of a society of Guernica-makers. One category under which we perceive Picasso's *Guernica* is 'PAINTING'. Standard for this category is flatness, and variable are features such as colour and shape. Perceived under this category, the work will likely strike a perceiver as, say, vivid. Now imagine a culture of Guernica makers, who make multiple works with the shape and colour properties of Picasso's original piece; that is, these colours and shapes are standard relative to this category. But variable is the flatness: works in this hypothetical category may have protruding figures or texture and so on. Perceived under this category, Picasso's *Guernica* would strike the perceiver as, say, serene, and certainly not as vivid. This, in brief, is Walton's descriptive *psychological thesis*.

¹⁴ One tempting way to capture this story is to add to Walton a Sibleyan supervenience thesis, which maintains that aesthetic properties supervene on perceptible physical properties of a work (Sibley 1959). By extension, changes in experience of the latter would make for changes in aesthetic experience. However, this story is controversial, since it commits to one particular reading of Walton (one that identifies perceptible properties as the supervenience base for aesthetic properties) and to one particular reading of Sibley's discussion of emergence, both of which are contestable. And in any case, a relation of this strength is unnecessary for the explanatory needs at hand. All that is needed is an explanatory relation between perception and aesthetic reaction, and causal dependence suffices for this. And if one prefers to talk in terms of supervenience of properties, then the perceptible physical properties are included in the supervenience base for aesthetic properties, and so differences in perceptual representation of the first can make for mental representation (of some kind) of distinct aesthetic properties. I owe much of these important qualifications to an anonymous reviewer for this journal.

Walton couples this with a normative *correctness thesis*. Correct aesthetic judgements regarding a work *w* are determined by the correct categories of art for *w*. What determines correctness of category? Walton argues that, typically, facts about the artist's intentions and the context of the creation of *w* determine the categories most appropriate for *w*. Walton's central argument for this second thesis is as follows. Our practices of appreciation and criticism dictate that aesthetic judgements can be mistaken. Relying merely upon the fact that a work has a large number of standard features relative to a category, and/or that it is more interesting when perceived under one category rather than another, encourages a radical relativism that conflicts with those artistic practices. This is so because there is no a-contextual constraint on constructing categories at will, and so you and I may cease to have a disagreement about a work *w* since our judgements of *w* depend upon distinct experiences of *w*, which in turn depend upon *ad hoc* constructed categories of art. This imposes a need for some constraint on categorization, and Walton suggests that artistic intention and context most naturally serve this role. Thus the context of a work generally determines the categories under which it is properly perceived.

Accordingly, knowledge about an artist's intentions, and/or about the normal categories under which *w* was appreciated (in the cultural context of its creation), guides one's categorization of *w* upon viewing. Therefore, knowledge of art-historical facts improves one's ability to perceive *w* under the correct category and, in turn, to better perceive and aesthetically judge *w*. This vindicates artistic expertise and rejects the innocent eye: the expert better perceives the work and its aesthetic properties precisely because her eye is not innocent.

It is important to note just how much of Walton's analysis is, or at least can be understood as, an analysis about *perception* of artworks. Categories of art, and the features standard, variable, and contra-standard relative to categories, are all supposed to be perceptually identifiable. Perceptual experiences of works vary with categories. Even the aesthetic reaction (that depends on perceptual experience) is naturally characterized as sensory in character. Finally, aesthetic judgements are made, and made more or less correctly,

on the basis of the perceptual (and aesthetic) experience. So Walton's claim is not the innocuous one that judgements of art co-vary with expertise. His claim is, or at least implies, that perceptual experiences of art co-vary with expertise, and judgements then follow. Understood this way, Walton's thesis is a profound one. But what is absent is any compelling story about the cognitive-perceptual structure that might explain how expertise has the alleged effects. The most we receive is the suggestion that categories each have a distinctive perceptual *gestalt*. But this is dissatisfying in a few ways. Most centrally for present purposes, Walton's *gestalt* gloss is really just Frank Sibley's (1959) emergence thesis recycled: aesthetic properties depend upon non-aesthetic properties. And so if you perceive a work under a particular category, say 'IMPRESSIONISM', you will be perceptually aware of some non-aesthetic features and not others, and the associated aesthetic *gestalt* may emerge. At most this gives us a thin account of the *perception-to-aesthetic reaction effect*, but nothing of the *expertise-to-perception effect*. The central focus of the remainder of this paper is to explain this second effect, while further supplementing Walton's account of the first effect.

III. Artistic expertise and cognitive penetration: Two sketches

Walton's claim that knowledge of art-history can and should influence aesthetic judgement of artworks, depends upon the descriptive claim that art-historical knowledge can somehow affect perceptual experience of those same artworks. The nature of this expertise-to-perception effect can be sketched in two ways. In turn, these sketches should lend additional plausibility to any historical-contextual theory of the norms of appreciation.¹⁵

III.1. Cognitive penetration and high-level properties

¹⁵ To be clear, the primary goal of this paper is to motivate the descriptive, psychological thesis of a Walton-style historical-contextualism, rather than the normative, correctness thesis. As will be further clarified throughout the discussion that follows, any compelling case for the psychological thesis provides leverage for the correctness thesis, since the normative thesis depends upon the truth of the descriptive thesis. But the truth of, and so any case made for, the descriptive thesis does not depend upon the truth of the normative thesis.

It is near orthodoxy today to think of perception as representational.¹⁶ When one has a perceptual experience as of a red, round tomato, experience represents a red round tomato. Note that on this *intentionalist* view, perception represents both objects *and* properties. The properties redness and roundness are perceptually represented (as instantiated in one's environment). Tradition has it that the properties represented by experience are *low-level*. Vision, for example, represents shape, colour, size, motion, and location properties. *High-level* properties—such as causal properties, emotional properties, agential properties, being a member of an artificial or natural kind—are represented only at the level of thought or judgement. The visual system does not “pick up on” these features of the world.¹⁷ Recent theorists have challenged this tradition and argued that perceptual experience can represent high-level properties. If the high-level content theorist is right, this would provide one way to understand the cognitive penetration of the perception of art.

The argument for high-level perceptual content is usually grounded in phenomenology. Siegel (2006) argues that when one acquires new recognitional capacities—for example, one learns how to recognize pine trees—the overall phenomenology of experience, when in the presence of pine trees, changes (by *contrast* to overall experience before acquiring the relevant knowledge). This change in overall phenomenology is best explained by a change in the phenomenology of visual experience (that is part of the overall experience). And this change in visual experience is best explained as a change in the representational content of the experience, where once one knows how to spot pine trees, *being a pine tree*—a high level property—is represented by visual perception.¹⁸

In addition to introspection, empirical data may be invoked to support a high-level content thesis. Tim Bayne (2009) gives an example of such an argument—also in the form of a contrast argument—appealing to research on *associative agnosia*. Associative agnosia, which can come in a variety of forms, generally involves a loss of some recognitional capacity,

¹⁶ Near orthodoxy: there are important dissenters. *Disjunctivism*, motivated to vindicate naïve realist intuitions, has a number of defenders, among them,; Martin 1997, 2004; McDowell 1982, 1998; Snowdon 1980-1; 1990. See Haddock and Macpherson 2008 for a collection of papers on the topic.

¹⁷ Defenders of (mere) low level content include Dretske 1995; Tye 1995, 2000; Prinz 2005, 2007.

¹⁸ Additional defences of high-level content include Bayne 2009; Siewert 1998; Siegel 2009. For a collection of papers on this topic, see Hawley and Macpherson 2011.

while perception in the relevant modality remains functionally intact (at least in the so-called “pure” forms of associative agnosia). To focus on just one kind of agnosia, general *associative visual agnosia* involves an inability to recognize previously learned objects—a comb, a toothbrush, a telephone—but with otherwise normal visual capacity. These subjects can still normally perceive the colours, shapes, locations and other basic properties of those same objects. This is evidenced by the fact that, for example, subjects perform perfectly when tasked to match visually identical objects from the same category.¹⁹

A plausible interpretation of these patients, Bayne suggests, is that they have intact *form* perception but impaired *category* perception. And this impairment involves a difference in phenomenal character. What it is like to see a telephone for the visual agnostic differs from the analogous experience for the normal visual perceiver. Note that this characterizes the disorder as a perceptual one, and not as a post-perceptual failure in judgement or knowledge. As Robert Van Gulick remarks, “seeing a telephone *as a telephone* is not something that accompanies visual experience; it is part of one’s visual experience” (1994: 46).²⁰ The central motivation for this characterization is straightforward: in all relevant cases, patients suffering from these disorders have the relevant knowledge and conceptual repertoire. Thus, what the visual agnostic lacks (or has lost) is not her concept of ‘TELEPHONE’. She can reason using the concept, has the relevant knowledge about telephones, and indeed can use a telephone. Rather what she lacks is a perceptual ability to process telephone-ish features. And this is in spite of a perfect perceptual capacity for identifying each of the basic perceptible properties *and* a concept of ‘TELEPHONE’. This is precisely why the phenomenon is striking and why it is not a post-perceptual one. The visual agnostic sees (in the visual sense of ‘sees’) the telephone differently than you and I do.

So this is a phenomenal contrast best explained as a difference in representation of high-level properties. These patients have normal low-level content, but they have a

¹⁹ There is a substantial empirical literature on these disorders, so only a few citations are offered here. Foundational conceptual work on the general topic of agnosia can be found in Lissauer (1890/1988). See also Humphreys and Riddoch 1987; Farah 2004.

²⁰ As Bayne credits him, Van Gulick (1994) first suggested the basic materials of the argument from agnosia for high-level content.

difference in high-level content. The visual agnostic cannot perceptually represent a telephone; you and I can perceptually represent a telephone. Therefore, high-level categorical properties—being a telephone, or a comb, or a toothbrush—can be represented by experience.

The high-level content thesis motivates one useful way to think about expertise and experience of artworks. The basic idea is this. When one perceives, say, a painting, experience may represent—in addition to low-level properties like colour and shape—standard aesthetic properties, such as being graceful, serene, vivid or delicate. Indeed, if the high-level content theory is compelling, then these are equally plausible candidates for admissible contents of experience. On the above characterization, when one learns what a telephone is, one may perceptually represent telephones. Analogously, if one learns what gracefulness is—how to recognize being graceful as such—then one can perceptually represent, for example, a ballet dancer as graceful. What is the role of expertise in this story?

Artistic expertise includes (but perhaps is not exclusive to) knowledge of artists and contexts of art creation. As one's expertise (whether one is a novice or a critic) increases, one's aptitude for correctly categorizing a work increases. Sometimes, one simply recognizes (in Walton's sense) in a work the relevant gestalt of a category, 'IMPRESSIONIST' or 'IN THE STYLE OF VAN GOGH'. Other times, one knows certain facts about the work and its presentation—*this* is the most critically praised Monet or *this* is an impressionist exhibit—and this guides (perhaps tacitly) categorization. Walton is right to emphasize this second point, suggesting that included among the causes of perceiving a work in a certain category are (a) what we have heard critics say and (b) how/where the work is presented to us (for instance, in a shopping mall vs. in an impressionist gallery).²¹ Either way, the categorization is partly dependent upon one's knowledge about the relevant categories, their members, and the artists (and cultures) that create works in those categories. Some of this is achieved just by looking at works, but some of it clearly requires thought.

²¹ See Walton 1970: 341-2.

This account can be extended in either a conservative or a liberal way. Suppose, in perceiving a work, that one wants to “get it right.” Accordingly, one will invoke art-historical knowledge to guide appreciation. The suggestion here is that this may affect perception in an important way, by first affecting the category of appreciation and then (or eventually) causing high-level property representation. Of course, after some time, the expert “internalizes” this procedure, so that she doesn't deliberately invoke knowledge; instead she just knows how to experience works. But the result is the same: a change in overall phenomenology of experience best explained by a change to high-level property representation. “Application” of the known category will causally affect experience, such that experience represents distinctive high-level properties. For example, relative to one category, say ‘PAINTING’, Picasso’s *Guernica* may be perceptually represented as violent; relative to the hypothetical category ‘GUERNICA’, *Guernica* may be perceptually represented as serene. This is the conservative way to characterize an effect on high-level perceptual content.

More liberally, if one thinks that aesthetic properties can be represented by experience, there is no obvious bar to maintaining that at least some categories of art—in Walton’s terms, the gestalt property associated with these categories—can be represented by experience. One may *just see* the impressionism or *just hear* the Brahmsianism in a work. And accordingly, one then perceptually represents additional high-level aesthetic properties like being dynamic or being balanced. Here again, this perceptual contrast is a causal result of what individuals know, or have otherwise learned, about artworks. Just like the pine tree-spotter, the impressionist spotter (by contrast with the non-spotter) has a distinct phenomenal experience of the Monet or the Sisley.

Described in either the conservative or liberal way, this is an instance of cognitive penetration as characterized in §I above. The phenomenon involves a cognitive-perceptual relation: where beliefs, concepts, or other cognitive states with content concerning artistic categories, influence perceptual experience of works. And this relation plausibly implies (some of) the relevant consequences. First, if the applied categories (understood, say, as beliefs or concepts) are correct ones, then one better perceives, and accordingly knows about,

artworks. If the applied categories are incorrect (e.g. by deviating both from the artist's expressed intentions and the norms for appreciation in the culture of the work), then one perceives the work more poorly, and accordingly knows less about them. This puts things neutrally, leaving open the question whether the cognitive effects on perception of art could aid or hinder knowledge about art. Either way, this is an epistemic consequence.²² Second, the relation suggests that perceptual systems are not modular in the sense that they are not informationally encapsulated from cognitive systems (namely, those that process semantically rich artistic content).²³

This account requires that aesthetic properties are *perceptually* represented. And one might, and Walton may, reject this suggestion, maintaining instead that art-historical expertise can only immediately influence experience of low-level properties. One may further worry that this account deviates from one plausible theory of aesthetic concepts. According to that theory, what makes properties like being graceful or being somber *aesthetic* and properties like redness and roundness *non-aesthetic*, is that the second require for their recognition only basic perceptual capacities, while the first require something more, some aesthetic sensitivity or some *taste concepts* (Sibley 1959). Both worries are disarmed by the same line of thought. Aesthetic properties are not, on the sketch offered here, basic or low-level properties. They are high-level properties that may plausibly depend in some important way upon the organization of low-level properties. So the sketch is compatible with, even if non-committal to, a Sibleyan supervenience thesis of the aesthetic. And the acquisition of aesthetic concepts is a genuine bit of learning: one learns how gracefulness looks or sounds. This is not a basic perceptual capacity, but one that comes only after one learns about

²² An historical-contextual account like Walton's will claim that the epistemic consequence is a good one. But this claim—roughly, Walton's "correctness thesis" as described in §II—isn't needed for the present, more neutral claim. Cognitive penetration, understood consequentially, includes a disjunctive condition that concerns *an* epistemic consequence, where this consequence could be epistemically virtuous or vicious. It is an additional and separable claim that this consequence is a good one (that is, in the context of perception of art, that cognitive effects on perception make us better art appreciators). As has been suggested above, a case for the descriptive claim lends support to this normative claim of historical-contextualism; but nonetheless the descriptive claim (that cognition penetrates perception of artworks) does not depend upon the normative claim.

²³ One complication here concerns the temporality of the expertise-to-perception effect. Some of these cases, like other standard alleged cases of high-level perceptual content, appear to be long-term effects of the acquisition of concepts or recognitional capacities. And standard alleged cases of cognitive penetration are not *diachronic* in this way but instead *synchronic*. This worry is addressed in §IV.

aesthetic appreciation. In Sibley’s terms, one must learn the taste concept ‘gracefulness’ before one can have an experience as of a graceful dancer.

If, nonetheless, one remains suspicious of this account—perhaps because one remains suspicious of high-level perceptual contents—then the next sketch, which countenances only low-level perceptual content, may be more compelling.

III.2 *Cognitive penetration and low-level properties*

If one accepts only low-level perceptual content, then if cognitive penetration occurs, it always and only involves a cognitive effect on the representation of low level properties. Perhaps the majority of empirical evidence adduced by cognitive penetrability theorists concerns cognitive effects on low-level perceptual content.²⁴ Here is one very recent experiment concerning the general phenomenon. Lessons can then be gleaned from this data to construct a case for the cognitive penetration of the low-level perception of artworks.

In a follow up study to two earlier studies, Cristoph Witzel and colleagues constructed a set of experiments on cognition and colour perception (Witzel et al 2011).²⁵ On a computer monitor, subjects were presented with images of highly “colour diagnostic” objects: a blue Smurf, the red Coca-Cola icon, the yellow German mailbox.²⁶ These images were presented in a random colour and against a uniformly grey background. The experimental task was to adjust the image until it appears to be a perfect grey. The control tasks were the same, but involved images of typically achromatic items (e.g. a golf ball) or of colour-variable items (e.g. a sock). For colour diagnostic objects, researchers found a significant *memory colour effect*; for colour variable or non colour-diagnostic images, no significant effect was found. For instance, for a Smurf image, subjects adjust the image past the point of perfectly achromatic grey and into the opponent yellow hue range. For a sock image by contrast, subjects consistently adjust the image to perfect achromatic grey.

²⁴ See fn 5 and 11.

²⁵ The two previous studies were Hansen et al. 2006 and Olkkonen et al. 2008. For discussion of one or more of these three studies, see Deroy 2013; Macpherson 2012; Stokes, forthcoming A; Stokes and Bergeron, unpublished manuscript.

²⁶ Colour diagnosticity was determined in a separate component of the study. Only images that ranked highest on reaction time *and* accuracy of typical colour identification were used in the main study.

Researchers hypothesize that, as in their earlier mentioned studies, subjects continue to see a colour-diagnostic item like a Smurf as blue even when the image is (objectively) achromatic grey. Subjects then compensate by adjusting the image into the opponent yellow hue range. And only then does the subject report that the image is perfectly grey because, by hypothesis, only then does she see the image as perfectly grey.

Note that this experimental methodology is *online*—subjects are instructed to adjust the colour appearance of a present image. And it involves perceptual *contrast* between control and experimental tasks. Plausibly, this case provides evidence best explained in terms of cognitive penetration. The effect on subjects is a perceptual one, resulting from beliefs (or concepts, if one prefers) about colour-diagnostic objects. And this cognitive-perceptual relation plausibly implies one or more of the relevant consequences. On the debate-neutral consequentialist line, the phenomenon is thereby cognitive penetration. Brief consideration of alternative interpretations further reveals the motivation for this inference.

The attention-shift interpretation is inappropriate, since there are no active attentional differences between subjects in control vs. experimental circumstances to explain the resulting data. The memory interpretation is inappropriate, since subjects are basing their reports (*that image is now grey*) on their current perceptual experience of the image. For similar reasons, the judgement interpretation is ill-applied. For it to aptly explain the data, the interpretation would have to maintain that a subject who adjusts, for example, a Pink Panther image significantly into the opponent (green) hue range both (a) veridically perceives the image as being greenish while (b) she reports that the same image is perfect grey. The combination of (a) and (b)—most basically, consistently erroneous judgement made on the basis of current veridical perceptual experience—is implausible given the significance of the effect, which in some cases was nearly as high as five times the threshold for discrimination. Finally, the intra-perceptual interpretation is a non-starter in this case: there is no account to be given about the evolution or plasticity of perception for the Pink Panther or the Coca-Cola icon.

Indeed, and on this last point, it is worth noting that many of the images selected were highly culturally sensitive. The experiments were performed in Germany and items accordingly varied in colour diagnosticity *for those subjects*. For example, images of the yellow UHU glue tube and the blue Nivea tin (the first a German made product, the second a product widely available through most of Europe) were highly colour diagnostic, while other images like the yellow Ferrari icon were, for those subjects, not colour diagnostic. In this study, researchers only ran experiments for colour diagnostic objects (relative to their class of German subjects). But presumably, the effect would vary significantly given variance in culture-specific images and/or subjects from distinct cultures. This strongly suggests that the memory colour effect is an effect of cultural learning on the perceptual representation of low-level colour properties.

Here again the empirical data and its interpretation provide an instructive way to think about expertise and experience of artworks. The basic explanation here is the same as the high-level content explanation in the previous section. Categorization (which is at least partly cognitive) causally affects (in an apparently direct way) perceptual experience of artworks. The difference is that on this account, the direct effect is only on experience of low-level properties (like shape and colour for vision). Add to this the plausible claim that aesthetic reaction (however this is characterized: perceptually or in some non-perceptual, cognitive way) causally depends on (low-level) perceptual experience. Accordingly, if perception of the low-level properties is sufficiently different (for example, by contrast to a case where the perceiver lacks the relevant background artistic knowledge), one may experience (in some extra-perceptual sense of ‘experience’) distinctive aesthetic properties.

Is the claim that, implausibly, for an art luddite versus an art expert, the perceived colours and shapes of a piece differ? Surely the represented low-level properties are stable across perceivers, the worry would go. There are two lines of response here, amounting once again to both a conservative and a liberal way to characterize the account of the cognitive penetration of (low-level) perception of artworks.

First, conservatively, the differences could be at the level of *organization* of the low-level properties. So it is not that the expert sees, for any one perceptible component of the piece, a distinct colour or a distinct shape. Instead, she experiences a distinct organization of those properties. One might think of this as a second order relational property, but it is no less a low-level property.²⁷ This, after all, is one plausible way to interpret Walton's emphasis on the perceptual gestalt: it is the overall look or appearance of the piece, given the organization of its basic features. It is this that can change by virtue of background art-historical knowledge. Perception of the gestalt of artworks is cognitively penetrable.

For example, most of Mondrian's *Composition* pieces of the 1920s and 30s are, relative to any other painter, very similar in appearance: grey or black lines of mostly uniform width placed vertically and horizontally on the canvas, with a number of coloured rectangular shapes at the intersection of some of these lines. Plausibly, there is a category of art, 'IN THE STYLE OF MONDRIAN'S COMPOSITION PIECES', relative to which these lines and coloured rectangles are standard, while variable will be the width, quantity, and spacing of the lines, plus the number, size, and colour of the filled rectangles. Relative to the more basic category 'PAINTING', all such shape and colour features would be variable. Someone ignorant of Mondrian's work would lack the former sophisticated category and so would view a particular work—say Mondrian's *Composition A (1923)*—under the basic category 'PAINTING'. What is different for the experience of this viewer, by contrast to the expert, is not that she fails to see any one line or coloured rectangle, but rather that because she lacks the more sophisticated category, she may fail to see the subtle organization of the piece. For an expert, these organizational features will be very salient when the work is perceived under the more sophisticated category. Thus the expert sees the same colours and shapes as the non-expert, but she also sees the lack of negative space and the dominance of coloured rectangles (since relative to other works in the more sophisticated category, *Composition A* is significantly less sparse). This will make for a phenomenal difference between expert and

²⁷ Recall that, as typically understood, high-level properties are kind properties, emotional properties, causal properties and the like rather than (for vision) shape, colour, motion, and location properties or their combination. On this construal, an organization of being red, being white, being flat, and being octagonal is a second order low-level property. Being a stop sign is a high-level property.

non-expert. This is a difference in perceptual experience, explained by the effect of the expert's applying the learned category, and it results in distinct aesthetic reactions. The expert may well describe this work, when perceived under the category 'IN THE STYLE OF MONDRIAN'S COMPOSITION PIECES' as vivid or dense, while the non-expert may judge it to be sparse or cold.²⁸

Second, and more liberally, it is not so implausible to think of cases where the first order low-level properties of works are perceived differently. After all, the Witzel et al. (2011) studies are plausibly of this kind, where culturally learned concepts or beliefs about popular fictional and marketing icons influence colour experience. And if one does not have knowledge of one of these images—say, one is unfamiliar with the blue Nivea tin—then one will have a colour experience of that object distinct from a perceiver who does have this knowledge.

By analogy, suppose an individual unversed in art, call him 'Testadura,' visits a modern art gallery and enters a room containing a few of Rothko's nearly monochromatic multiform paintings. Testadura is sufficiently knowledgeable to perceive these works in the category 'PAINTING'. In this context and with this minimal knowledge, the works appear to be all broadly monochromatic and composed of very similar rectangular shapes. Contrast: Suppose that at a distinct time an expert, call him 'Monroe', visits the Rothko Chapel in Houston. And suppose that some of the very same works (as those viewed by Testadura) are exhibited. Given what Monroe knows, plus information acquired about the Rothko Chapel, he will perceive the works under the category, suppose, 'IN THE STYLE OF NEARLY MONOCHROMATIC ROTHKO MULTIFORMS'.²⁹ *Standard* relative to this category are

²⁸ For purposes of this example, as a useful point of contrast to *Composition A (1923)*, the reader may want to consider Mondrian's *Composition II (1922)*.

²⁹ The reader should recall that Walton is no less liberal in designating categories. The only criteria he seems to maintain are: for identification of categories, the categories must be categories *of art* and members of a category are perceptually identifiable. And the correctness of a category is then determined by largely historical-contextual facts. In this case, there are important facts about the art culture: art appreciators recognize the monochromatic multiform theme in Rothko's work and group his works accordingly (as is evidenced by the similarity of the works shown at the Rothko Chapel). And though Rothko presumably would not have described these examples of his work in the terms used here to name the category (including his own name 'Rothko'), he plausibly had an intention that the works be recognized and appreciated for their similarities (and,

dark colours and rough rectangles, but these features are *variable* within a narrow range. For instance, the colours may vary within a low chromaticity range. Accordingly, some of the same works would plausibly be perceived by Monroe as *more* colourful, or as being of a subtly different hue (even if nearly monochromatic). This is a contrast in perceptual representation of low-level (colour) properties, dependent upon the expert knowledge possessed by one perceiver versus another. Differences in aesthetic reaction may follow: Monroe may say, of a work, that it is striking or bold, while Testadura may say of the same work that it is boring or lifeless.³⁰

Conservatively or liberally, this sketch hypothesizes that expert knowledge penetrates the experience of low-level properties of artworks. The resultant experience may then cause aesthetic reaction, which finally causes aesthetic judgement. An historical-contextualist theory of norms of appreciation would continue as follows. If the category is a correct one—where, as per the correctness thesis of §II, correctness is determined by art-historical facts about the work—then these judgements will more often be correct. Thus expertise-influenced perceptual experience of artworks better enables proper appreciation and judgement of those artworks.³¹

IV. Further considerations and conclusion

Offered above are two sketches of how artistic expertise can, somewhat directly, affect perceptual experience of artworks. With various qualifications, both sketches make the claim in terms of cognitive penetration: cognitive states like beliefs or concepts about art causally influence perceptual experiences of art. And this influence apparently implies

in *that* context, their differences). Granting this, the sophisticated category named here (and the above mentioned Mondrian category) is a perfectly legitimate one.

³⁰ It may be no more than anecdote, but I suspect that anyone who has visited the Rothko Chapel will find this description (of the expert perceiver) very apt. One's aesthetic response, and I'd conjecture one's perceptual experience, of Rothko's works, in that context, are markedly different than experiences had in a more typical gallery.

³¹ But again, just as noted above (see fn. 21), the descriptive cognitive penetration claim (or expertise-to-perception-effect), defended here, can be separated from an additional normative claim about art appreciation. In the terms used above to describe Walton 1970, the truth of a *psychological* thesis does not depend upon the truth of a *correctness* thesis.

important consequences for the epistemology and science of the mind. Before addressing a few worries, this general claim deserves brief clarification.

First, the claim is compatible with differences in effect for different sense modalities. For example, vision is plausibly our most dominant sense modality: normal human perceivers rely upon vision with far greater frequency for spatial and object-level cognitive tasks.³² Accordingly, the effect of expertise on vision may be less pervasive than on audition and experience of music, or for that matter on flavour and the experience of food and drink. Second, there is no claim here that artistic expertise will always have this effect on experience. There are a variety of reasons that, on any one given occasion, an expert of some degree may have an experience of a work unaffected by her expertise. Finally, and related, there is no claim that expertise must be overtly applied to an instance of art appreciation. Very plausibly, expertise often plays a covert role, as will be clear below in the discussion of attention.

Here is the first of four possible worries. Most cases of cognitive penetration as standardly described are *synchronic*, where cognitive states have a fairly (temporally) immediate internal effect on experience. But the high-level description in §III.1 is of a *diachronic* effect, since the effect on experience is the result of top-down learning, which takes place over time. So, over time, the impressionist works *look* more and more different to a perceiver as a result of her learning more about impressionism. What reason is there to think that diachronic cases like these, involving artistic expertise, are cases of cognitive penetration?

Answering this worry reveals how some of the recent debates about cognitive penetration may be merely verbal after all. If indeed ‘cognitive penetration’ is defined in a way so as to capture only synchronic causal effects of cognition on perception, then the cases described in §III.1 involving gradual changes to high-level perceptual content are not cases of cognitive penetration. But this suggests that the phenomenon as defined is not the only one of relevant interest. Recall the important consequences agreed upon by both parties of the debate. In particular, recall the worry about theory-ladenness, which suggests that

³² See Stokes and Biggs (forthcoming) for defence of the claim that vision and visual imagery are, relative to all other sense modalities, both cognitively and epistemically dominant. See Bergeron and Lopes (2009) for discussion of empirical data that suggests that vision influence music perception in important ways.

empirical observation may be affected by an observer's theoretical beliefs or commitments. This possibility threatens the epistemic role of observation in rational scientific theory choice. Now, synchronic cases of cognitive effects—where a belief regarding, say, a heliocentric universe directly and relatively immediately changes the observer's perceptual experience—would be one way to understand theory-ladenness. But it is neither the only nor the most plausible way. It is more plausible that as one's theoretical beliefs develop in content and strength of doxastic commitment, one's perceptual experiences gradually change as well. So insofar as this kind of cognitive effect is plausible at all, it is far more plausible as a diachronic effect. As Paul Churchland describes the phenomenon, the perceptual effects are the result of gradual changes in the scientist's training, technology, practice, and so on.³³ In this light, diachronic penetration looks like the norm, not the outlier. "Who ever claimed that the character of a scientist's perception is changed simply and directly by his embracing a novel belief?" (Churchland 1988: 175).

This line of thought gives additional motivation to the consequentialist approach. Focusing on the consequences, the diachronic cases may plausibly count as cognitive penetration. Or, more weakly, these cases are at least not discounted by virtue of their diachronicity. This (partial) verdict is delivered by appeal to one of the debate-neutral consequences—theory-ladenness. A diachronic theoretical effect on perceptual observation has implications for how perception is invoked for rational theory formulation and choice. The artistic cases are no different in kind: artistic expertise and training, like scientific expertise and training, can change perceptual representation (of high-level properties). And this effect is no less interesting for taking place over time. By contrast, appeal to more rigid extant definitions of cognitive penetration often, or so it has been suggested, discount these cases just by virtue of the effects being diachronic ones. But if the consequences are of central importance to all parties of the debate, then this negative verdict is unprincipled.

³³ Here the connections with one of Kuhn's most central and famous claims is clear. A scientist becomes "normalized" by the scientific paradigm within which she works. And this social fact can have marked effects on how she observes, interprets, and reports (Kuhn 1962).

A second worry follows from this last one. In all of the non-aesthetic cases discussed, whether in scientific or ordinary contexts, the cognitive effect on experience is epistemically problematic. For example, in experimental studies, one misperceives the colour or size of an object. And the worry about theory-ladenness is that theoretical beliefs may *bias* perceptual observation in a problematic way. One may then worry that cognitive penetration is not an appropriate mechanism for expertise-influenced experiences of artworks, insofar as this effect is supposed to be an epistemic good: where *correct* aesthetic perception and judgement co-varies with knowledge about art. Since the primary goal of this paper is only to argue that there *are* cognitive effects on perception of artworks, a complete defence of the normative claims of the historical-contextual theory of appreciation is not offered here. That said, the worry may be disarmed by acknowledging that while most of the recently discussed experimental studies do suggest the opposite interpretation, there are plausibly “good” cases of cognitive penetration.³⁴ Here again the analogy with science and technology is apt. One can imagine that an oncologist may better see, not just judge, the presence of tumours. A highly trained ultrasound technician may *perceptually* recognize in an early prenatal sonograph the sex of the fetus. An experienced auto mechanic may instantly recognize, just by hearing, a squealing sound as a failing serpentine belt rather than some other part of the automobile.³⁵ These are examples of epistemically good cognitive effects on perception. Here again, insofar as cognitive penetration plausibly occurs, then these are no less plausible as candidate

³⁴ An *explanation* of this feature of relevant empirical studies may appeal to an analogy with how lesion studies are used in cognitive neuropsychology. Here, researchers attempt to determine what proper brain function is by considering what happens to cognitive performance when some part of the brain is damaged. Thus identifying errors or malfunctions, and their neurological basis, paves the way for identifying proper functioning (see Coltheart 2001). Something like this paradigm is often in use in perceptual psychology, where subjects in highly controlled circumstances are somehow primed or set up for certain kinds of errors, and then lessons are drawn about the proper functioning of perceptual systems (e.g. when error-inducing primes are absent).

³⁵ It may be worth noting that for each of these cases, there are available explicit mechanisms for training persons to make the relevant identifications. (Indeed, for expecting parents, there are countless internet sites available that purport to provide guidance on how to *interpret* fetal ultrasound images.) The suggestion here is that, at least for some such experts, this becomes a *perceptual* accomplishment, not a mere capacity for best interpreting information received by perception.

occurrences of the phenomenon. In like manner, there are plausibly epistemically good cases of cognitive penetration in the context of art appreciation.³⁶

Finally one may worry that the aesthetic cases discussed in §III did not receive the same thorough defence as the empirical studies (as discussed here or elsewhere in the cognitive penetration literature). Something can be said about the two most obvious alternative interpretive strategies, and why they less plausibly apply to the kinds of aesthetic cases considered. The judgement interpretation and attention-shift interpretation are considered in turn.

Suppose the various cases discussed above are described at this level of description: artistic expertise can influence the aesthetic reaction to artworks. Described this way, the phenomenon may be interpreted in a way that rejects cognitive penetration, maintaining instead that expertise only affects post-perceptual judgement about artworks, while the perceptual experiences of artworks are the same, in relevantly similar perceptual circumstances, for the art-ignorant and the art-expert perceiver. So we have a choice, explain the phenomenon as an effect on experience or as an effect merely on cognition (as per the judgement interpretation). Here are three reasons to prefer the first choice.

First, there is a powerful analogy between the aesthetic cases and the cases found in recently discussed empirical studies. In the Witzel et al. (2011) studies, it was argued that the best explanation of the data is that learned concepts or beliefs (or perhaps other “higher-level” cognitive states), regarding cultural artifacts, influence colour perception. Similar experiments have suggested that racial categories influence lightness perception, and that artificial objects of differing valence can affect size perception³⁷. In all cases, the inference is abductive. But the simple thought here is that if this explanation is most plausible in these controlled circumstances, then it is most plausible in circumstances of art appreciation. Like the concepts in these studies, aesthetic concepts and categories of art are learned. So if

³⁶ The general underlying question here—whether cognitive effects of these sorts, if they occur, are epistemically good or bad—is an important one and in need of further analysis. See Lyons 2011 and Siegel 2013 A&B for some recent discussion.

³⁷ See Levin and Banaji 2006 for an example of the first. For philosophical discussion, see Macpherson 2012; Siegel 2011; Stokes, forthcoming A. See Bruner and Goodman 1947 and van Ulzen et al. 2008 for the second. For philosophical discussion, see Stokes 2012.

culturally acquired mental states affect experience in controlled experiments then it is equally plausible, if not more, that artistic expertise does the same in non-controlled circumstances.

The second reason is phenomenological. Nearly any person unversed in this debate, upon hearing the suggestion—that what you know or think about art may affect how an artwork, perceptually, appears to you—will reply with an “Of course!”. And this is true even after one clarifies for the newcomer the nature of the possible phenomenon by using the terms common to the cognitive penetration literature. From the point of ordinary introspection, then, cognitive penetration is the more plausible hypothesis.³⁸ Introspection does not serve to adjudicate, conclusively, between the two interpretations. But it does serve as another reason to prefer one interpretation—cognitive penetration—over the other.

Finally, a cognitive penetration interpretation provides a more unified explanation. Note first that introspection also suggests, prior to sophisticated theorizing about perception, that the recognition in works of aesthetic properties like ‘being somber’ is phenomenal in character. It feels differently to react to a work as being somber versus as being vivid. This furthermore comports with our practices of criticism and appreciation (for instance, non-philosophical discourse about aesthetic features is regularly, if not dominantly, put in sensory vocabulary.) The judgment interpretation struggles to unify this intuitive observation with the empirical and introspective data of the previous two paragraphs.

Consider: both interpretations acknowledge that in the described cases aesthetic reaction to artworks varies with expertise. So, by virtue of artistic knowledge a viewer will make distinct judgements (distinct from those she would make absent that same knowledge). For instance, suppose she judges an impressionist painting, *w*, to be somber. This difference needs an explanation. The judgment interpretation will be constrained in the following ways. The differences in expert judgements about *w* cannot be explained in terms of sensory

³⁸ As a brief exercise, consider how Rothko’s multiform paintings looked to you before you knew much about art by contrast—supposing you now know a lot more about art—to how they appear to you now. Introspection will suggest that they strike you, perceptually, differently. If one is unversed in such works, then this provides an interesting informal experimental opportunity. One can take advantage of this cognitive-perceptual position: first view (in a gallery) a handful of Rothko’s works, then learn as much as one can about his work and its context, and then return to those same works. The introspective methods in question are notoriously imperfect, but the prediction is that they will suggest to the viewer a phenomenological change before and after learning about the work of Rothko.

phenomenology or representation (since these changes are exactly what the interpretation denies). So, the low-level colour and shape properties, of *w*, as perceived by expert and non-expert, are the same. And, if one admits such contents, the expert perceptually represents the same high-level properties. Now, if experience of aesthetic properties such as 'being somber' causally depends on non-aesthetic (low-level) perceptible property representation, then the expert's aesthetic reaction goes unexplained: there is no change in the low-level experience to explain a change in the dependent experience (of somberness). If aesthetic properties are high-level perceptible properties, here again the judgement theorist is left without an explanation of the difference, since a change in high-level perceptual representation is still a change in perception, and this is just what the judgement interpretation denies. Finally, the judgement theorist could claim that relational properties of artworks are included in the supervenience base for aesthetic properties. This is a defensible metaphysical theory of aesthetic properties (and indeed one interpretation of Walton). She would then claim further that the relevant difference between the expert and non-expert is this: only the former viewer knows about the relational properties (e.g. facts about the work's creation) and her aesthetic reaction follows accordingly. This aesthetic reaction (for a judgement theorist) could then be understood either as a purely cognitive, non-phenomenal one, or a non-perceptual phenomenal reaction. This amounts to an explanation that either denies that aesthetic reactions are phenomenally characterized, or it claims that they are cognitive states (judgements) with phenomenal character. The first move is counter to intuition and much of critical practice; the second move commits to controversial claims about cognitive phenomenology.

By contrast, a cognitive penetrability interpretation provides a simpler and more comprehensive explanation. This interpretation can avail itself of either of the following explanations: expertise affects the supervenience base of aesthetic reaction by affecting low-level phenomenal content. Put with no talk of supervenience, expertise affects low-level perceptual experience, upon which aesthetic reaction causally depends. Or if one admits high-level content, expertise causes the perceptual representation of high-level aesthetic

properties. Either way, a *phenomenal* change results from expertise, and this phenomenal change explains the difference in judgement between expert and non-expert.

Finally, the critic may instead invoke the attention-shift interpretation. This reply is an important one and, more generally, the relations between attention and cognitive effects on perception are much in need of careful theoretical analysis. In the context of the present discussion, we need to ask how attention may count against, versus be neutral with respect to (if not count for), cognitive penetration. This section closes with a suggestion for framing this general discussion, with an eye towards attention and perception of art.

No commitment to any one theory of attention should be made here.³⁹ Instead, three possible dimensions of variation for attentional phenomena (or, according to some, attention-like phenomena) will be identified. And then three mental, causal schema are identified, each of them varying in important ways along these dimensions. (There are other possible dimensions of variation, and other possible causal schema, but not relevant to current concerns.) The dimensions are these: First, attention can be agential or non-agential.⁴⁰ Second, some attentional mechanisms can be influenced (or receive input from) cognitive states, while some cannot be influenced by cognitive states. Third, activation of attentional mechanisms may or may not result in changes in conscious perceptual experience.⁴¹ These dimensions of variation are further clarified below, as the three causal schema are explained in detail.

³⁹ Attention has long been a central topic for research in the behavioural and brain sciences and, only recently, in philosophical research. Nothing like an exhaustive list can be offered here, but for empirically informed philosophical discussion of attention see Mole 2012; Mole, Smithies and Wu 2011; Watzl 2011 A.

⁴⁰ Two notes: A variety of other terms are used in the relevant literature, roughly marking the same distinction. Attention may be *voluntary* or *involuntary*; *overt* or *covert*; *personal* or *sub-personal*. Second, some philosophers argue that only agential or voluntarily controlled attention is, properly called, attention (see Wu 2011 A, B; Prinz 2011; Watzl 2011 B). Reasons for this construal are theoretical (e.g. some argue that this secures a unified phenomenon of attention). It should be noted, nonetheless, that these theorists do not deny various involuntary selection mechanisms (like those to be discussed below), nor that these mechanisms can partly, causally determine perceptual experience; they simply deny that those mechanism are part of attention. If one prefers a view of this sort, the dimensions of variation discussed are still genuine, but they concern (partly) “attention-like” mechanisms. And so one should substitute ‘attention-like’ wherever relevant. This does not change any step in the argument. This qualification made, the discussion that follows should be agreeable both to theorists who claim that attention is always agential and those who claim attention is only sometimes agential.

⁴¹ For an example of the latter, see Jiang et al 2006. Here researchers found that the behavior of experimental subjects is influenced by briefly exposed but unrecognized (that is, not consciously perceived) images of nudes.

The first causal schema is one given by the attention shift-interpretation, and is the most common (perhaps only) attention-based response in the cognitive penetration literature. Here, the perceiver actively and deliberately moves her body *because* she has certain beliefs or desires about some object or event in her environment. In a case like this, attention is agential; one performs, in philosophers' terms, an *intentional act* of attention. Second, this attentional act is driven by some cognitive states. Finally, this action typically results in perceptual changes. The schema takes the following rough form:

(a) *Cognitive state* → *Intentional act of attention* → *Perceptual experience*

So in the gallery, one thinks about and then changes one's distance from the painting, and many times over. Or at the symphony, one sometimes thinks (because one knows the score) to focus on the sound of the woodwinds and then, at other points, to focus on the sound of the percussion. These attentional differences clearly make for perceptual differences, but in ways so uncontroversial that no party of the debate is happy calling the phenomenon 'cognitive penetration'. Scenarios like this, critics such as Fodor (1988) urge, are no different from visually attending to one part of the duck-rabbit image, rather than another, because one wants (and knows how) to see the rabbit. If one knows the trick, one can see the rabbit. Here the critics are correct: a mental phenomenon properly described by schema (a) is not cognitive penetration. The question to ask is whether all cases of art appreciation (or, generally, all attention-involving cognitive-perceptual relations) will be appropriately described by this schema. To approach this question, consider the following intuitive distinction.

Appreciation of artworks can take the form of *rigid appreciation* or *natural appreciation*. In learning about art, many people learn how and where to look, and learn how and when to listen, and so on. And formal training in either art studio or art appreciation studies makes these attentional methods explicit. In initial practice of these methods, one may think "now look here" or "now listen to this part", and then act accordingly. Call this the *rigid appreciator*.

Intuitively, art appreciation does not always involve these explicit and overt acts of attention. For one thing, many do not learn this way, having never received *any* kind of formal artistic training. Some learn, instead, by looking and listening. And as one experiences more and more artworks, and more and more artworks of similar categories, coupled with the acquisition of knowledge about the context and history of artistic creation, how one looks and listens naturally changes. Call this the *natural appreciator*. This is similar in an important respect to the practices of many art critics. Unlike the natural appreciator, many critics enjoy formal, laborious training on how to attend to artworks. But like the natural appreciator, the critic does not always explicitly employ methods of attention. Instead, these methods are internalized. After enough training and enough experience, the critic simply looks or listens, having internalized these ways of attending.

Attention of this kind, be it to artworks or whatever, is importantly different from that described by schema (a): it is non-agential (in the sense that it does not involve intentional acts of attention). The questions that follow are these. Do we have empirical evidence that attention can operate in this non-agential way? If so, do these attentional mechanisms influence conscious perceptual experience? And finally, can these non-agential attentional mechanisms be influenced or partly driven by cognitive states? Positive answers to each of these questions are sketched below, and partly by appeal to empirical research. In turn, this will deliver the second and third causal schema, and complete a framework for analyzing questions about attention and cognitive penetration.

The answer to the first question just above is straightforward and should be uncontroversial. Brief mention of a few of the most dominant scientific theories of attention makes this point clear. According to one broad category of theorizing about attention, influenced centrally by Broadbent (1958), attention involves the selection from an overabundance of information, and only the information selected (that which passes through the “bottleneck”) is attended. A second broad category of theorizing takes attention to perform the role of “binding” various perceptible features—like shape and colour for vision—identified by disparate processing streams (Triesman and Gelade 1980). And most recently,

competition-based theories of attention, take attention to be an emergent feature of many neural mechanisms that resolves (or “chooses a winner of”) competition between stimuli recorded in various parts of neural processing (Desimone and Duncan 1995). An important, and relevant, unifying thread to these distinct theories is that attention serves to either select or filter information, and much of this is done automatically, out of the control of the perceiving agent. So attention—or at least a mechanism that many theorists want to call ‘attention’—can be non-agential. Does this mechanism influence conscious perceptual experience?

A fairly clear answer to this second question is also delivered by recent empirical research. A number of studies, both neurological and behavioural, have found that valenced stimuli are selected by attention earlier than neutral stimuli. Using brain event-related potentials (ERP) recordings, Carettié et al (2004) found that negative images (e.g. a snarling wolf) capture attention as early as 105ms after stimulus presentation, positive images (e.g. an opposite-gender nude) as early as 180ms, and only later (after 240ms) is attention captured by neutral images (e.g. a wheel). In each case, the “capture” is non-agential. And this phenomenon has an effect on conscious experience. Most simply, valenced stimuli can capture (and distract) attention and, accordingly, result in perceptual experience of that stimulus (at the exclusion of other stimuli in the environment). For example, conscious perceptual effects are pronounced for threatening stimuli like angry human faces or snakes (Öhman et al 2001, 2012). Indeed, the general phenomenon is a perfectly familiar one: things in our environment “grab” our attention. The grabbing is not done by us, and it is things that can hurt or help us that more quickly grab. Perhaps more interestingly, recent studies suggest that these automatic attentional mechanisms can influence low-level perceptual experience. For example, Carrasco et al (2004) found that automatic attentional mechanisms affect visual contrast sensitivity, and later research shows effects on visual representation of size and colour, among other properties (see Carrasco 2009). All of this suggests a second causal schema:

(b) *Non-cognitive states* → *Non-agential (attentional) selection mechanisms* → *Perceptual experience*

There are a number of decisions to be made in how schema (b) is further characterized. First, as intimated above, some contest the claim that attention can be non-agential. And so these theorists would accept the intermediate causal relatum as schematized, absent mention of ‘attention’. Second, and relatedly, are these selection mechanisms part of, or merely deliver input to, perceptual processing? No matter how one makes these theoretical decisions, what seems clear is that these selection mechanisms are actual, and they influence perceptual experience. This is the only claim that need be granted here. Finally, ‘Non-cognitive state’ is listed as the causal antecedent to the selection mechanisms. This is really just a placeholder, intended to flag a contrastive feature: one difference between schemas (a) and (b) is that the intermediate attention/selection relatum in (b) lacks a *cognitive*, causal antecedent.

For reasons just given, then, schema (b) will not appropriately describe instances of direct cognitive effects on the perception of artworks. But identification of (b) does provide an important lesson: there are well-evidenced mental phenomena that involve non-agential attentional effects on perceptual experience.⁴² Accordingly, an instance of art appreciation that roughly fits (b) (say, where an angry face depicted in a painting grabs one’s attention at the exclusion of the banal flower arrangement in the painting) is not an instance of cognitive penetration. However, this is true *not* because attention is part of the causal story, but instead because there is no relevant cognitive state that *is* part of the causal story. Put contrastively, what bars an instance of (a) from being cognitive penetration is that the agent is doing something to effect a perceptual change (recall Fodor’s duck/rabbit “trick”). What bars an instance of (b) from being cognitive penetration is a lack of a cognitive penetrator. Finally, then, the question is whether these perception-influencing, non-agential selection

⁴² It is worth noting that there are principled reasons for simply counting these selection mechanisms as *part of* perceptual processing. What these selection mechanisms do, most basically, is select the information or cues that are then processed by the relevant neural structures. And this processing then results in, or constitutes, a conscious perceptual representation. And for that matter, if one holds the view that attention is necessary and sufficient for conscious perceptual experience, and these selection mechanisms are attentional, then it is a logical consequence that these mechanisms are perceptual (see Prinz 2011; de Brigard and Prinz 2010; Hine 2010).

mechanisms can be influenced by cognitive states. Are there mental phenomena appropriately described by the following causal schema?

(c) *Cognitive states* → *Non-agential (attentional) selection mechanisms* → *Perceptual experience*

A phenomenon that fits (c) would not be appropriately explained by the standard alternative interpretations, most importantly, the attention-*shift* interpretation. Instead, a phenomenon described by (c) involves a cognitive-perceptual relation where background cognitive states influence either how perceptual systems process information *or* how pre-perceptual mechanisms select information and then input it to perceptual processing (the choice here depends upon independent theoretical commitments). Either way, this would be a direct, or nearly direct, cognitive effect on perception. And any such phenomenon would bear important consequences for the epistemology and architecture of the mind; it would be an instance of cognitive penetration.⁴³

Are there reasons to think that, generally, there are phenomena that fit schema (c)? And, are there reasons to think that some of these instances involve antecedent cognitive states with art-related content (namely, expertise as described throughout this paper)?

Recent neuroscientific evidence is suggestive even if inconclusive. Researchers have found that “behaviorally relevant” stimuli modulate attentional capture. For example, Buffalo et al 2010 found that in object tracking and discrimination tasks, processing in V4 (a “higher” visual processing neural region) fed back into the processing in typically “earlier” areas V1 and V2 (see also Desimone and Duncan 1995; Desimone 1996). Other researchers found that a subject’s anticipation (often cued by a designated task) influences attentional selection in a top-down way (Ruff and Driver 2006; see Ruff 2011 for review of the relevant

⁴³ Reasons for this verdict should be sufficiently clear by this point. But, briefly: a scenario that fits schema (c) would involve perceptual processing that is unencapsulated relative to cognitive systems, thus implying consequences for the alleged modularity of perceptual systems. And the influence of these background cognitive states on perceptual experience would threaten (or at least bear *some* consequence for) the general and scientific epistemic roles of perception. Put in the terms of theory-ladenness, the effect, even if mediated by attentional mechanisms, involves a theoretical input to perceptual experience which thereby threatens the theory-neutrality of that experience.

systems-neuroscience literature).⁴⁴ Again, these data are inconclusive, and largely due to the infancy of these neuroscientific methodologies and technologies, but they are suggestive enough that many empirical researchers now take it for granted that automatic attentional mechanisms are driven in a top-down way by cognitive states or processes.

Couple these empirical data with the intuitive story about natural appreciation. Armchair intuition and reflection on one's own experiences of art suggest that although one may rigidly appreciate art, one may also sometimes appreciate art more naturally. In such cases, the appreciator will not be (or not only be) overtly executing any learned methods of attention. Instead, she will simply be looking or listening, and with care, while her perceptual systems do the rest of the work for her. It is worth noting that, just like face or emotion recognition, appreciators can often make fine grained distinctions about art but without being able to describe the details or cues that enable these distinctions. This characterizes the perception of art, like the perception of other things, as a kind of skill, and moreover, a kind of skill that is malleable in ways sensitive to past learning about art and culture. Furthermore, the execution of this skill, as it were, is not always agential in any relevant sense.

So we have some empirical reason to think that higher brain areas may modulate non-agential, attentional selection mechanisms. And these data comport with an intuitive folk story about what we have called natural appreciation, where perceptual experience of artworks (and other kinds) changes with expertise, and in ways that do not always involve intentional uses of attention. These are at least *prima facie* reasons to think that perception of artworks can sometimes fit schema (c), and therefore reasons to think that perception of works may involve an important role for attention, while still being instances of cognitive penetration.

None of this is conclusive, but it is progress: the discussion of the last few pages moves beyond a simple assumption of extant theorists. That assumption is captured by the following conditional: If attention is part of the causal explanation of a relation between

⁴⁴ Anticipatory states are identified by researchers by use of what some call "baseline shifts" (Chawla et al 1999), where fMRI recordings are taken when the subject is "preparing" for a stimulus or to make a judgment (once the task has been instructed) but, importantly, prior to presentation of the relevant stimulus. See also Kastner et al 1999, and Ruff 2011 for general discussion of this methodology.

cognition and perception, then that relation is not cognitive penetration. This conditional is true only if one grants the further assumption that schema (a) is the only possible one. But there is an additional important causal schema in (c) (gotten at by way of (b)), where non-agential attentional mechanisms are influenced by cognitive states and, in turn, influence perceptual experience. So the assumed conditional is false. There are other ways that attention *could* be involved in cognitive effects on perception.⁴⁵ This is the first lesson. The second lesson is that any phenomenon that fits schema (c) would be cognitive penetration. This changes the dialectical space. The question now becomes, in the context of thinking about attention and cognitive penetration, are there *any* phenomena appropriately described to fit schema (c)? The cognitive impenetrability theorist must motivate a ‘no’ answer to this question; she must claim that no actual psychological phenomena fit (c). The above discussion has provided some reason to think the opposite is true. Expertise may affect perceptual experiences of artworks through the mediation of non-agential attentional mechanisms. This would be the cognitive penetration of perception of art, mediated by attention.

Conclusion

Perceptual experiences of artworks are rich. This is a commonplace observation. The analysis of this paper offers a novel account of one way that these experiences might be enriched. They might be enriched by being directly affected by what we believe, conceptualize, or otherwise think about art and artistic culture. And this effect may occur in a variety of ways unremarked in the current literature on cognitive penetration, for example diachronically or through the mediation of non-agential attention. These are insights for philosophical aesthetics and more generally for theories of cognition and perception, and they were gained by careful consideration of the perception of artworks.

It is also commonplace to think that artistic expertise affects our appreciation of and judgement about artworks. Critical practices are grounded in acquired knowledge about

⁴⁵ The intended modality here is conceptual. But the empirical research discussed just above suggests that application of a nomological ‘could’ is plausible.

genre, style, cultural history, and so on. And adjudication of a rational disagreement about a substantive or verdictive judgement about a work—that it is balanced or that it is beautiful—often proceeds by appeal to facts about art, artists, and culture. These considerations of art practice counter the formalist, who claims that art appreciation *should* only involve an entirely innocent eye. The analysis given here offers further reason to think that the latter view is misguided, and largely by arguing that perception of works simply is not as the formalist prescribes: perception of works is sometimes affected by beliefs, concepts, and other cognitive states about art and artworks, *and* this may sometimes be out of the perceiver's control. And, further contrary to the formalist, this provides a viable psychological mechanism for an historical-contextualism. A way of putting the profound thesis, inspired by Walton, is that when one makes correct aesthetic judgements, it is because one better perceives the work. And when one perceives better, perhaps it is because one knows better. One's expertise about art can penetrate one's perceptual experiences of art.

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