## IMAGE CONTENT

## Mohan Matthen

It is a lamentable but inescapable fact that the world is not always as it appears to our senses. On the brighter side, one can normally rely on any given appearance being true. In short, the senses are reliable, but not perfectly so.

These propositions were, throughout most of history, taken for granted by most philosophers, who, depending on their philosophical bent, emphasized one of them over the other. In ancient Greece, Plato led the pessimists. He maintained that the senses are unreliable and inchoate; what they tell us must be clarified, if not wholly supplanted, by reason. The ancient sceptics overshot Plato: according to them, the senses carry no credibility; nothing they tell us is more probable than the opposite. Aristotle led the optimists: the senses provide a platform for systematic knowledge, he says (*Post. An.* II 22). The Stoics went even further—according to them, some kinds of perception are guaranteed to be true. Philosophers in ancient and medieval India pursued the same lines of thought. They acknowledged sensory illusion. The central problem of epistemology, according to them, was whether sensory illusion betokens a veil of ideas between the perceiving subject and the external world. Philosophy in the modern period continues these debates, albeit with increasing precision and refinement.

All of these approaches to perception imply (on very natural assumptions) that the perceiving subject is presented with a *proposition*—the proposition that the world is a certain way. This proposition is often entitled the *content* of a perceptual state. A subject’s perceptual experience is true or false according to whether the proposition it presents—that is, the proposition that constitutes its content—is true or false. When something *looks* green, the perceiver is being presented with the proposition that it is green; if the thing *is* green, the propositional content of this presentation is true, and hence the appearance itself is also true.

As the present volume demonstrates, claims such as these have come under fire from many directions. Even in the ancient world, Epicurus denied that sensory appearance could be *false*. His argument is especially interesting to my project in this paper because it explicitly rests on something like the idea that perception is an *image*. “The portrait-like resemblance of impressions . . . would not exist if the things which we come into contact were not themselves something,” he wrote.[[1]](#footnote-1) The idea is that external things leave their mark on the senses; these marks are the consequence of a process of transmission from external object to the senses. Since this process preserves a certain resemblance, sensory impressions are “portraits.”

If Epicurus is right, the “portrait-like” sensory appearance is merely a causal trace. As such, it cannot have propositional content. The image cast on a screen by a slide-projector is a “portrait” of the slide, but it would be strange to call it “true” for this reason. Epicurus thought that sensory appearance is like this projected image. We can use it to figure out the condition of external things by inference from nature of effect to nature of cause. Thus, he holds that “falsehood and error are always located in the opinion which we add.” In effect, this position conflicts with the idea that sensory appearance can be *true*: for if falsehood is “located in the opinion which we add,” so also is truth.In him, therefore, we find one form of a “no-content” view of the senses. (The impressed-image theory is inconsistent with what we now know of sensory processing, as I will indicate in section IX, and an untenable basis for a no-content view.)

These ancient positions, as well as their more recent descendants, are interesting not just for what they say, but also for what they omit. Sensory content is imagistic, as Epicurus explicitly acknowledges. Opinion and belief, by contrast, are (in standard cases, at least) *linguistically* expressed. Belief is not normally directed at an *image*—my opinion that the sky will be blue today is directed toward a sentence, not an image of the sky. One can, of course, believe an image, as I will later indicate. But there is still a serious omission in contemporary theory: there is no discussion of how an *opinion* can interact with an *image*. Since the former is linguistic in the manner it conveys content, and the second is not, this is a problem—images cannot bear on sentential attitudes directly; only a sentential description of an image can do so.

In this paper, I seek to clarify the nature of image content and its expressive limitations. In particular, I shall inquire into how the characteristics of image content bear on the issues of representational content indicated above.

### Image and Perception

Perceptual experience[[2]](#footnote-2) has image content. To wit:

(a) Perceptual experience presents the subject with a spatiotemporally ordered array of sensory qualities.

But this is a characteristic that perceptual experience shares with iconic memory and sensory imaging. It is different from these other imagistic states because:

(b) Perceptual experience presents the subject with a state of affairs as occurring *here* (in the sense that everything is experienced as located relative to the perceiver) and *now*.

Memory and sensory imaging do not present states of affairs as occurring here and now. This is how they differ from perceptual experience.[[3]](#footnote-3)

It is hard (as we shall see) to understand how both (a) and (b) could be true. Experiences of the sort described by (a) are *imagistic—*some of the key characteristics of imagistically expressed content are laid out in Section III-IV. But, as I’ll argue in section VI-VIII, images are incapable of fixing places and times, except relative to one another. That is, an image can present one thing as further away and over to the left of another, but not as in a particular place (e.g. London) or at a particular time (e.g. five minutes ago). So how does perceptual experience present something as here (i.e., in *this* particular place) and now (at this time)? How *can* it? This is just one question that arises from taking image content seriously.

Before we go on, a clarificatory remark is in order. Often, image content is contrasted with *propositional* content, on the grounds that images cannot be assessed, as propositions are, in terms of truth and falsity and related semantic evaluations. In my view, this is a mistake.

Here is why. On *any* non-deflationary account (see section IX), an image is an image *of* a state of affairs—an image *of* a way the world can be. (Put aside impossible images, which require a more complicated account.) For example, an image of a face presents a state of affairs in which a face exists in a certain place relative to a point of view—a face that is such-and-such colour, surmounted by thinning hair, with a long nose, . . . and so on. The image may, further, present the face as singing a song, having soft skin, and possessing other non-visual features. (My notion of an image is multisensory; the “sensory qualities” of (a) above may belong to any modality.) We can, therefore, assess the relationship between an image and any possible world. Is the image an image of that possible world? Or: how true is the image of that world? And this is just like the relationship between a sentence and a possible world.

An image is an image of a *type* of situation. It is not an image of a *particular* situation—rather, it is an image of any situation of the type that it depicts. In order for it to be true—that is, true *non-relationally*, not merely true of a specified situation—it has to be *applied to*, or *asserted of*, a particular situation or existentially quantified over a range of situations. *Perceptual experience* applies its image-content to the perceiver’s here-and-now. It conveys this import simply in virtue of the kind of experience it is. In other words, when a subject has a perceptual experience, its import to her is that the image she experiences is an image of the situation here and now. It is *true* if the present situation is as presented.[[4]](#footnote-4)

By contrast with perceptual experience, recollection is quantified: it presents its image-content as being true of *some* situation or other in the past that the subject was herself a part of, and occupied a certain place relative to the point of view. And anticipation presents its image content as true of a future situation, the time of which may be specified by an accompanying thought. These asserted images are not applied to particular places and times; rather they are quantified over place and time ranges. They are accurate or inaccurate depending on whether there was or will be a situation of the type represented. Asserted images possess truth-value and verisimilitude. On the other hand, a merely imagined image is not asserted of any situation or range of situations. It entertains a situation-type, and does not present this as an image of any particular situation. As such, it is neither true nor false.[[5]](#footnote-5)

The contrast between image content and propositional content is a mistake. Image content expresses a proposition when it is asserted (and a situation-type when it is not). The correct contrast is between *sentential* *vehicles* of meaning and *imagistic vehicles*. Both sentences and images express propositions, but they do so in different ways. They are, one might say, different formats for expressing propositions. My aim in this paper is to understand the peculiarities of image content—that is, of imagistic vehicles of perceptual meaning.

### From Image Content to Belief

Many philosophers assume that there is a non-problematic way to express sensory content by means of *sentences*. This is natural enough in many cases. A sentential report of perceptual content such as:

*S.* That looks like five men running toward me.

is perfectly adequate for many purposes. In theoretical contexts, however, it can be dangerous to use sentential specifications of sensory content without clarifying how they stand to sensory images. Consider, for example, the very natural claim that perception justifies belief (which occupies a central role in such works as Pollock 1974 and McDowell 1994). It is obvious what this claim means when perceptual content is specified sententially, as above. Unfortunately, though, the relations that *images* bear to sentences are not well understood. And it is consequently theoretically under-specified how perceptual images stand to sentences, and consequently exactly what sorts of images support a belief like *S*.

The logical empiricists addressed the question of image-sentence relations head-on. According to them, perceptual images (or what Hume called an “idea”) unproblematically support certain simple sentences, which they called “protocol sentences.” On the standard reading, protocol sentences are restricted to the specifying the locations of sensory qualities—for example, “There is an instance of red over to the left”.[[6]](#footnote-6) Now, it is not unanimously agreed exactly what features are given in sense perception. Some, like Hume, take a very restrictive view (“if we see it, it is a colour”). For Hume, protocol sentences for visual content would be restricted to “There is an instance of *C* in *L*,” where *C* stands for a colour and *L* for a location. But others hold, for example, that material objects and their shapes are directly seen; this would allow a larger class of protocol sentences.[[7]](#footnote-7) To circumvent this disagreement, let us just stipulate that there is a class of qualities directly given by sense perception. The class of protocol sentences is defined relative to this class. I would add that these qualities are given as inhering in objects located in shared public space.

Let us concede to the logical empiricists that the relationship between sensory images and protocol sentences is unproblematic. There remains the question of how we reason from perceptual image content to non-protocol beliefs. Consider non-protocol perceptual beliefs that depend on past learning as well as perception. For example, consider: “That is an Airbus A380 taxiing out for take-off,” or “That man is interested in that woman”. We arrive at such beliefs on the basis of perception—how? According to the logical empiricists, such beliefs are derived from perception in a two-step process. First, we move from perception to a set of protocol sentences. Then we move to beliefs such as the above by the use of “constructions” on sets of protocol sentences.

For reasons I won’t discuss here, this is a discredited program. From my point of view, the main objection is that there is no clear way to capture what an A380 looks like, given that we see such objects from many different points of view in diverse conditions of illumination (etc.). Even more obviously, we cannot define how sexual interest appears to the senses, in all of its many different contexts. In short, we cannot define or “construct” such objects or features in terms of sensory qualities alone.[[8]](#footnote-8) The interesting question arises, therefore, whether one can go directly from perceptual images to “rich” perceptual beliefs by-passing the intermediary stage of protocol perceptual beliefs. The problem is that this would require an indirect and problematic image-sentence transition.

In sum, the obstacle to a satisfactory account of perceptual belief-formation is that, putting protocol sentences aside, we don’t have a good general account of transitions from image-content to sentence-content. On the other hand, we do have good general accounts of sentence-sentence inference. The logical empiricists solve the problem of belief-formation by relying on the special case where we *do* have a clear transition. They assumed that they could then use the method of construction to carry the inference train forward to rich perceptual beliefs. Given the failure of their program, it seems that we would want to explore learned image-sentence transitions. And this takes us back to square one: we have at best a poor understanding of how we reason with images, as opposed to sentences. Philosophers who discuss perceptual belief rarely see the need for an account of this.[[9]](#footnote-9) John McDowell is an exception: his assertion of conceptual content in perception is presumably meant to serve just this role. However, conceptual content is just a placeholder, since we have no good idea of how perceptual images interact with concepts.

Though I will make a tentative suggestion about the transition from images to rich perceptual beliefs, my purpose in this paper is mainly negative. I shall sketch some important characteristics of sensory images, with a view to showing how these lead to certain expressive limitations. This *rules out* certain kinds of perceptual content. More specifically, I’ll argue that images cannot express particular times and places (though they can express relations of locations and times, such as ‘*x* is to the left of/earlier than *y*’). As well, they cannot referto particular individuals. So if perceptual experience and iconic memory refer to particular individuals, or express fixed spatiotemporal locations, they must do so in virtue of something outside of the image they present. I’ll make a suggestion as to what this might be.

Finally, I’ll argue that on natural assumptions about sensory images, deflationary theories of content are on shaky ground: it’s hard to understand images as *not* expressing content. On the other hand, it is probably true that images do not express rich sentential content.

### Elements of Image Content

Perceptual experience has image content, but so also do sensory imaging and episodic memory. In this section and the next, I will lay out some general characteristics of sensory image content as it is found in these types of experience.

1. *Predicative Feature-Placing*
2. Sensory content is about *properties* or *features.* In perception, these usually appear as predicatively belonging to individual *sensory objects.*[[10]](#footnote-10)

Traditionally, sensory content was taken as specifying only an array of sense properties (or *features* as I will call them) in a space-like arrangement—the sensory “field,” as it is called. But the *Gestalt* psychologists established that the scene is broken up into *objects*. In vision, these are primarily material objects,[[11]](#footnote-11) but there are other types as well—shadows, volumes of darkness, holes, gaps, light sources, patches of light, rays of light, clouds, and perhaps many more. (Spelke 1990 is an influential and informative review of the development of object perception in infants.) These objects “take their properties with them”: when they move, their features (or at least some of these features, depending on the kind of object) change location to match. (A shadow can move and grow and change shape; i.e., the *same* shadow can be seen as occupying different places and as having different shapes and sizes.) Movement and qualitative change are perceived as properties of *objects*, and objects must therefore be included in perceptual content, over and above features and locations. (See section IV below and Matthen 2005, chapter 12.)

As will become clear in what follows, sensory *images* are not of particularobjects, i.e., of individuals. On the other hand, perceptual, and possibly recollective, *experience* always is of particular objects. As I have indicated, one problem is how. I shall argue that this particularity comes from outside the image. Sensory images mark *places* (identified, not absolutely, but relative to a point of viewing) as occupied by *some* object of a certain (sortal) type.[[12]](#footnote-12) (I’ll argue in support of this in section V.)

To sum this up, the content of a sensory image can be expressed by a set of what I call “(predicative) feature-placing structures” of the form <sortal *S*, feature *F*, location *L*>. Each such structure expresses a situation-type in which an object of sortal type *S* instantiates feature *F* occupies location *L* (identified relative to a point of view).[[13]](#footnote-13) As mentioned earlier, an experience acquires truth-value when such a feature-placing structure is asserted of a particular situation, or quantified over a range of situations.

In sensory images, locations are given from some point of view. Some say that the point of view is that of the subject, but this is not always true. In “observer perspective” memory images, the subject images herself from a removed perspective. For example, you might recall yourself going to kindergarten, viewing yourself from above or from behind. (It is noteworthy here that the self is not identified by recognition; rather, the self comes “tagged” as such.) As well, one can imagine how a scene would look from a particular point of view without imagining oneself placed at that point of view. The decisive examples are those in which you yourself appear in the scene. For instance, you can imagine what you look like from behind if you were to cut your hair differently. Such examples demonstrate the possibility of imaging a scene, even one that does not have oneself as a part, without imagining that one is oneself the viewer. Of course, this is not true of *perceptual* experience. The “here and now” of such experience depends on the point of view being that of the perceiver. But one should not generalize from this to other types of sensory experience.

1. Image content is logically simple. It expresses no more than a series of <*S, F, L*> structures, as above. In particular, it cannot express negation, disjunction, or quantification. There is no image, for instance, of all tigers being striped.
2. The senses represent some places as unoccupied. This could be understood as a feature-placing structure of a different form <Ø, Ø, *L*>, meaning “There is nothing, and no instance of any feature, at *L*.

Representing a place as unoccupied is perceptually (as well as logically) different from giving *no* information about a place. Audition gives you no information about certain places; you may just fail to hear anything in the space in between yourself and a source of loud music, without “hearing” silence there. But you can also hear a room go silent, or silence in a particular place. Similarly, vision gives you no information about occluded places or about the backs of objects you see (though it represents these objects as having backs)—but it can also reveal that a particular place is not occupied.

I’ll return to the *Predicative Feature-Placing* condition in section IV, where I discuss the objects of each sense modality.

1. *Spatiotemporal Connectedness*
2. A sensory image places objects and their features in a unified spatiotemporal matrix. A unified matrix is a set of spatiotemporal locations such that every member is spatially and temporally related to every other.
3. Perceptual experience presents the subject with a single unified matrix.

The Spatiotemporal Connectedness condition is closely connected to one of Kant’s main claims in the *Transcendental Aesthetic*, namely that things perceived as existing objectively occupy “one space”—i.e., that there is only one spatial matrix for such things. (See Matthen, forthcoming, for discussion.)

What about free-floating visual features: after-images, “stars” that are seen when one is struck on the head, floaters, phosphenes, and so on? Similarly, what about the ringing in the ears of tinnitus? It seems that these figments are *not* taken as possessing location in the external world, relative to material objects and other external things. They are not, moreover, asserted of the here-and-now situation; that is, a floater is not experienced as part of a situation-type that the here-and-now instantiates. A floater may be experienced as over to the left of the visual field, but not as having location relative to a chair or table over to the left. While floaters and the like may obscure or occlude seen objects, they nonetheless don’t seem to occupy the same position any external object, or even a determinate position in front or to the left of any external object. The same holds for ringing in the ear; it doesn’t come *from* anywhere.

Figments of this kind are perceived as self-generated, and they do not seem to occupy the space occupied by external objects. They do not have the feel of something *perceived*, as opposed to merely experienced; a ringing in the ears is not, for example, experienced as existing *here* where I am, or *now*.If Kant is right (and I think he is), everything one perceives as objectively existing is perceived as existing in a single space; further, he adds, one *can* only represent one space. It seems to follow that such “figments” are not experienced as spatially located, properly speaking, even though they have some kind of spatiality.

The following explicatory comments are about *spatial* location.

1. The *Spatial Connectedness* condition is fairly obvious for *vision*. Visual experience is of objects arrayed in a “visual field”. (Opinions about the nature of this field vary, [[14]](#footnote-14) but nobody denies that there is one.) Since the field is a unified spatial matrix with no gaps, everything in it has location with respect to everything else. In visual *perception*, each place in the field is located relative to the subject.

However, this need not be so for visual imagination. For one can visualize two objects without imagining how they are related to one another. For instance, one might image the Eiffel Tower and the Tokyo Tower together in order to compare them, with the Eiffel Tower on the left. Yet, one might not imagine a specific distance between the two landmarks. In such a case, I will stipulate that one is entertaining more than one image at the same time. Each of these images presents a unified matrix.[[15]](#footnote-15)

1. *Auditory* objects are spatially arrayed in normal auditory *perception*, in which there is awareness of direction and of distance. Moreover, everything heard is locatable relative to everything seen, touched, etc. It is often noted that auditory location is not as precise as visual location; nevertheless, everything heard is located relative to the subject, if only as surrounding her, as a voice does in an echo chamber, or residing inside her head, as does an auditory image generated by stereo headphones. By contrast, when you hear a voice or a melody “in your head”—i.e., when you imagine it or remember it—it may not seem to have extension or location. For even if an imaged piece of music has many voices, they may not be heard as in any particular direction or at any particular distance from you, or from each other. But when you hear it live or play it on the stereo, all of the voices have sensed locations. [[16]](#footnote-16) So a melody in your head is, in a sense, an incomplete image that lacks certain spatial information.
2. *Touch* is complicated: when something touches you—for instance, when you are leaning back in your chair—then if you are immobile, you simply feel pressure on your back. Of course, parts of the body are spatially arrayed, so the pressure on your back is positioned in space. However, it is anchored to the coordinate system of your body, not that of external space. Thus, even if you are aware that you are moving—e.g., when you are driving in your car—the pressure on your back is not sensed as moving. By contrast, when you haptically explore an external object by stroking or feeling it, the object you are touching is externalized, and tactile qualities—hardness, coldness, flatness, etc.—are sensed as belonging to *it*. As J. J. Gibson (1962) writes:

In active touching and looking the observer reports experiences [that] correspond to the environment instead of to the events at the sensory surface. The experiences noted with passive stimulation can scarcely be noticed, if at all. (489-490)

So touch seems simultaneously to deploy two coordinate systems, though (as the transition between passive and exploratory touch shows) the two systems represent the same spatial matrix.

1. Interestingly, haptic exploration has multimodal impact: *flavours* get attached to objects in the mouth by just the above-mentioned process of haptic exploration using the tongue and mouth. It is the cracker in one’s mouth that seems to be salty, though presumably the salt is distributed throughout the mouth by being dissolved in saliva.[[17]](#footnote-17)
2. Finally, *smell*: given a stationary subject, the objects of olfactory perception have undifferentiated spatial location (“Here!”) or (according to some) no location at all (because it is held that to a stationary subject, they are merely sensations: see Christopher Peacocke 1983[[18]](#footnote-18) and Lycan 2000). However, given movement, manipulation, and sniffing—that is, by exploratory or active smelling—odours can be precisely located as emanating from particular external objects,[[19]](#footnote-19) which are in turn located with the aid of vision and touch. Like touch, smell has an active mode. This active mode gives awareness of a different field of locations than the passive mode.
3. *Property Coding*

Sensory appearances are representations of properties, for instance, colour, pitch, loudness, and so on. Colours have characteristic looks; notes sound a particular way; and so on. Sensory qualities are recognized by how they appear.

Here are some important constraints on the “vocabulary” of property presentation in sensory images:

1. *Unique coding* Each modality presents each determinate sensory property *P* in only one way. (Some features come in bundles. For example, there is a look not of a square simply, but rather of a square as viewed from a particular angle.[[20]](#footnote-20)) There are no “synonyms” within a modality: the visual presentation of each colour is the same; the visual presentation of a square from a given oblique angle is the same. And so on.
2. *Non-Ambiguity* Sensory experiences of determinate features (or feature bundles) are unambiguous. Thus, the phenomenal character of the visual experience of one shade of bluecannot be the same as that of another.[[21]](#footnote-21)
3. *Availability* A subject cannot experience a sensory property without knowing what sensory property she is experiencing.

*Availability* is somewhat reminiscent of Mark Johnston’s (1992) *Revelation* principle. Johnston says that the *intrinsic nature* of a sensory feature is fully revealed when one experiences it. I claim only that one cannot experience a sensory property without conclusively identifying that property, not that one thereby knows anything about the property. Finally:

1. *Similarity coding* Sensory presentations enable subjects immediately to recognize similarity within each sensory property-type such as colour or pitch (i.e., each determinable).[[22]](#footnote-22)

*Similarity Coding* is stated by Paul Boghossian and David Velleman (1989): “One can tell on the basis of visual experience alone whether two objects appear similarly coloured.” Colour is a sensory feature, and the same holds, *mutatis mutandis*, of other sensory features.

1. *Part-Whole Composition*

The senses present their objects as spatiotemporally extended only by presenting the spatiotemporal parts of these objects located with respect to each other as they are in the object (or sometimes as a two-dimension projection of that array). For example, they represent a triangle by representing the sides and angles of the triangle; they represent the sides by representing the vertices and the points in between. (When a part of such a line is occluded, it is represented “amodally.”)

Susan Carey (2009, 458) puts the above condition in the following much simpler way: “parts of the representation correspond to the parts of the entities represented.” This formulation works fine with pictures or maps. Carey’s example is a picture of a tiger: “The head in the picture represents the head of the tiger.” The intended contrast here is with the word ‘tiger’, no part of which represents a part of any tiger.

It is less clear what counts as the represent*er* or vehicle*—*the analogue of the picture —when we *see* a tiger. Perhaps an activation pattern of neurons in the brain.[[23]](#footnote-23) It is also unclear whether the parts of such a neural activation pattern show the same part-whole composition. That is, if *N* is a state of the nervous system that imagistically represents a tiger, then must there be a contiguous part of *N* that represents the head of a tiger? And must this part be spatially related to the part of *N* that represents the tail in the way that tiger heads and tails are spatially related?

We *can*, however, say this: if *N* is any kind of image of *T* (mental or graphic), then *N* must represent not only *T* but at least some of the spatial parts of *T*—i.e., all of those that can be sensed from the perspective that the subject occupies. In this respect, the mental image of a tiger will still contrast with the word ‘tiger’.

### More About Predicative Structure in Image Content

The feature-object structure of perceptual content is, again, relatively obvious for vision. Here is a simple pair of visualizations that demonstrates it.

First, imagine a row of transparent objects. Imagine that starting from the left and continuing towards the right, each successively turns blue and then back to transparent, perhaps by an internal light being turned on and then off. Imagine that this is done slowly enough that the display does not fuse, and is not seen as a single moving object. Call this the *Shifting Blue* phenomenon or *SB*.

Now imagine just one of these objects in its blue state moving from left to right. Call this the *Moving Object* phenomenon or *MO*.

Of course, there is more than one difference between *SB* and *MO*: for instance, there are spatial gaps in *SB* and a smooth trajectory in *MO*.However, the phenomenological difference between *SB* and *MO* is not limited to the sequence of blue-occurrences in various places. It includes that a *single* moving blue object is presented in *MO*,but not in *SB*.(Actually, if *SB* is speeded up, it will look just like *MO*: the gaps will disappear.) This difference between the two presentations is not captured by all the feature-*place* pairs in each. For since the idea of movement is one of a single object taking its properties with it, this difference must be accounted for by positing that *blue* is predicated of one object in the phenomenology of *MO*, and of many in *SB*.(Objects need not be material objects: colours may appear to belong to fringes, shafts of light, shadows, vapours, auras, etc.)

Motion perception (and also perception of change) demonstrates that visual content represents features as belonging to movable objects, mainly material objects. What about the other senses?

1. In audition, the smallest objects are *sounds*. Sounds are events that cause the waveform vibrations in the air that excites the ears (Casati and Dokic 1994, Pasnau 1999, O’Callaghan 2009): events such as a bow being drawn across a string or the vibration of somebody’s vocal chords. (More specifically, they are the last cause of such waveform vibrations that are not themselves waveform vibrations: Matthen 2010a, 82-83.) Auditory *qualities—loud*, *soft*, *high*, *low*, etc.—are transmitted by waves in the acoustic medium, and correlate with properties of those waves. Nevertheless, what we *hear* is a property of the event that causes the waveform. Audition attributes features to located events: for instance, *a man is playing the drum loudly there.* This attributes a property to the event that consists of the man beating a drum; it does not attribute a property to the sound waves that the beaten drum emits.

Audition also identifies composite sounds: melodies, phonemes, speech streams. These are composed of sounds, but the auditory system recognizes them as single entities (Matthen 2010a). These objects have properties that are detected by audition: a falling tone, a diminuendo, a harmonic resolution, etc. are such properties.

1. In active touch, the primary objects are surfaces of objects, but when the subject can either see the object he is touching, or can actively touch it by stroking, feeling, and palpating, surfaces appear voluminous (Gibson 1962). When vision is active alongside touch, the objects to which tactile qualities are attributed are often those defined by vision, both with respect to their location and with respect to their exact contours. (In passive touch, as discussed earlier, the objects are part of the body.)
2. The objects of olfaction are odours, distributions of volatile chemicals in the atmosphere, but they are not, of course, presented as such. Odours have extended location, though it takes movement to detect this. Odours are the bearers of *smells*, which are olfactory qualities such as *sweet* and *burnt.*[[24]](#footnote-24)One can also smell material objects, but this takes active olfaction: moving around, picking things up, and sniffing. In such cases, again, the bearers of olfactory qualities are defined by other senses—vision and touch, in particular.
3. Finally, flavours are typically attributed to objects in the mouth, which are located by touch. Analogously to vision, it is possible to have free-floating flavours, such as after-tastes, located in the mouth, but with flavour too these are normally not mistaken for flavours that reside in a sensed object.

### Limitations of Image Content

Though images and sentences both express propositions, there are propositions that cannot be expressed by images. For example, as I said earlier, negation and universally quantified propositions cannot be expressed by a sensory image.

Now, some *sententially* expressedaccounts of sensory content seem to violate the above conditions on image content. For example, Susanna Siegel (2006) claims that when a subject *S* is looking at an object *o* that appears to be external to her, *S*’s visual experience *has the following content*:

(PC) If *S* substantially changes her perspective on *o*, her visual phenomenology will change as a result of this change. (*ibid.*, 358)

PC violates every condition on images laid down in the preceding section. For instance, PC seems to imply that one of the things visual experience presents *as content* is its own “visual phenomenology”: that is, according to PC, visual experience does not merely *possess* phenomenology, but reveals something about this phenomenology. But this violates the *Property Coding* condition because there is nothing that visual phenomenology looks like. (Rather, visual phenomenology is how objects and features look.) Again, it is unclear how a visual experience could represent the “will change if” conditional in PC. Without wishing to question that *some* conditionals are represented by vision—for example, the conditional proposition that a moving object will be at some place if it continues to move— it is unclear what the PC conditional in PC. And *where* is this conditional? Perspective-change has spatiotemporal parts—but how are they represented? For these reasons, it is hard to see how an *image* could represent PC.

Elsewhere Siegel says, more simply, that

in the typical experiences of object-seeing, objects are presented as being denizens of the external world rather than as mind-dependent entities of some sort (*ibid.*, 374)

This better respects the conditions on images articulated above. Externality is, one could say, a feature that attaches to a located object. Somebody could doubt that externality *looks* like anything—“What is the characteristic look of externality?” one might ask, “What colour is it?” (See Hume’s argument in section VI, below.) But I don’t see this as much of an issue: clearly some things look as if they are in the external world, and others do not. (This is what Siegel relies on.) The contrast between PC and the above formulation illustrates how some things can and some things cannot be expressed by images.

Much the same criticism applies against John Searle’s (1983) famous account of visual content:

I have a visual experience (that there is a yellow station wagon there and that there is a yellow station wagon there is causing this visual experience)” (48).

This requires that visual experiences be represented by visual experiences. But visual experiences are not visibilia; they are nowhere in the visual field. It requires, moreover, that a causal interaction that has no location in the visual field be represented.

### Shared Image Content

Now, consider these cognitive states:

*P* (Perception). You are standing in the rain: you see, hear, and feel it.

*M* (Imaging). You imagine standing in the rain: you imagine how it would be to see, hear, and feel it.

*R* (Iconic recollection). You recall standing in the rain: you recall how it looked, sounded, and felt.

*P*, *M*, and *R* are states of a perceiver that involve similar sensory images. They are about similar scenes; as such, they share content. And in principle, any thing one can perceive or imagine or recall can constitute the content of one of the other kinds of act. This gives us the following:

*Shared Content Principle* Any perceived feature-placing structure could figure in the image content of perception or recollection or imagination.

There are important differences among the above states too, as we have noted. *P* is here-and-now directed relative to the perceiver, and gives her an unmediated reason to believe that its content holds of the here and now. (It may be relevant that *P* is steadier than *M* or *R* in the sense that it is more stable, and requires no effort to maintain in a steady state—however, this is not part of the image content of the *P*-experience.) *R* is past-directed—it gives the perceiver reason to believe its content, but in the past tense. It may well be indeterminate as to the exact time of occurrence, and place-directed only by captioning or recognition. (See I.2.iii-v above.) *M* does not have any indexical reference to place or time; it does not give the subject reason to believe anything about the world external to her own mind.[[25]](#footnote-25)

One might ask: “How can the import of *P*, *M*, and *R* be different, given that their imagistic content is the same?” Must there not be some importantly different element of content that accounts for the differences noted earlier? If this is so, does it show that there is a *non-imagistic* kind of content that the senses deliver, content that distinguishes perception, imaging, and memory? This runs counter to most conceptions of how the senses operate, and this raises problems. I’ll return to these questions later (though it is not the purpose of this paper to answer them authoritatively). But first let me say why I think it is difficult to account for these as differences in *image* content.

Here is an argument using the Shared Content Principle to reach the conclusion that the here-and-now character of perception is not a part of image content.

*Shared Content Argument I*

By the *Shared Content Principle*,if *F* can be imagistically attributed to an object at an absolutely identified location in perceptual experience, then it can be so attributed in imagination.

But imagination does not represent absolute locations. (Condition I.2.iii-iv).

Therefore the definite location of feature *F* is not *imagistically* represented in perception.

It follows that the here and now character of perceptual experience and the past-regarding aspect of episodic memory are not imagistically represented.

I am, of course, not denying that perceptual states reveal the absolute locations of objects in the subject’s vicinity. In fact, I mean to assert that they do. My claim is rather that they do not do so by means of their image content, for if they did, then the image content would continue to do so when reproduced in imagination.

### Hume on the Expressive Limitations of Images

The position I have articulated on the expressive limitations of images has interesting historical counterparts. Consider Hume’s argument that existence is not imagistically represented:

I do not think there are any two distinct impressions, which are inseparably conjoin’d. Tho’ certain sensations may at one time be united, we quickly find they admit of a separation, and may be presented apart. And thus, tho’ every impression and idea we remember be consider’d as existent, the idea of existence is not deriv’d from any particular impression. (*Treatise* I.II.vi)

Now, as is well known, Hume is committed to some extreme positions concerning content. In particular, he is committed to:

*Berkeley’s Principle* If my being in a sensory state *S* is compatible with the falsity of *p*, then *p* is not the content of *S*.

Berkeley uses this principle to argue, for example, that visual states never represent distance. Hume uses it to argue that there is no idea of a substance, or of causation (except as conjunction), and so on. However, the above argument is not committed to any such premise. It rests only on certain assumptions about image content, and these are pretty much as those articulated in Section I, above.

In the above passage, Hume’s premise is that image content (ideas and impressions) can express two distinct properties only by two separable ideas. Now suppose that I perceive something—for instance, a person sitting across from me—as existent. It is possible to imagine that that very person does not exist. In order to do this, however, I am not obliged to imagine the person as *perceptually* different in appearance. Thus, it is possible to subtract existence without subtracting any perceptually derived idea. This shows that the idea of existence is “not deriv’d from any particular impression.” At this point, Hume’s empiricism kicks in. Since there is no separable idea of existence in what we perceptually experience, Hume concludes that existence is not a distinct feature. “The idea of existence, then, is the very same with the idea of what we conceive to be existent,” he says. In other words, we conceive of everything as existent.

It is not clear to me that Hume is right in this last conclusion. It could well be that in order to imagine that the person sitting across from me is not real, one does have to subtract the perceptually derived idea of externality. (This was my gloss on Susanna Siegel’s argument in Section V above.) However that might be, I agree with Hume’s insistence that images, i.e., ideas in a spatial matrix, are limited in expressive power. My method for detecting these limitations is somewhat similar to his. My method is to look for shared content. If two sensory acts are directed to the same sensory image, but differ with respect to some commitment, *p*, then *p* cannot be part of the image content of these sensory acts. And if expressing *p* would require contravening the characterization of image content in Section I above, then *p* cannot be expressed by any image.

### Outside the Image

Let us return now to perceptual experience. Here is a second Shared Content Argument about experience, again quite Humean in spirit.

*Shared Content Argument II*

Suppose that perceptual experience *P* imagistically expresses scene *S*.

*P* conveys to the subject that the scene that presently surrounds her is of type *S*.

A memory experience and an imaginative experience that express *S* would not convey to the subject that the scene that *presently* surrounds her is of type *S*.

Therefore, the imagistic content of *P* is not what conveys to the subject that the scene that presently surrounds her is of type *S*.

The above argument shows that the sense that perceptual experience expresses something about the present occurs “outside the image”.

I have argued elsewhere (Matthen 2012) that vision is about individual objects because the visual system sub-personally furnishes the perceiver with egocentric coordinates for these objects, and that these coordinates enable the perceiver to attend to and interact with these objects. Since attention to an object is required for the formation of beliefs about that object, these egocentric coordinates serve the epistemic role of vision. These coordinates are not a part of the visual image, but are rather furnished to a system that controls gaze and attention independently of the conscious visual image. They are, moreover, absent from non-perceptual vision—memory and imagination.

Here, I want to offer a simpler model. This simpler model has the disadvantage that it relies on a substantial amount of approximation and idealization. Its main virtue is that it generalizes to all of the senses, and that it fits well with the here-and-now characterization of perceptual experience offered in this paper.

By the definition given earlier, scenes are spatiotemporal distributions of features in sensory objects. The spatial relations of these sensory objects are defined by the distances between them. For it is a fact of geometry that a set of elements with fixed pair-wise distances forms a rigid structure the shape and size of which remains fixed under rotation and movement from one place to another. It follows that as long as you estimate the pair-wise distances for a set of objects correctly, you know how they are arrayed, regardless of your perspective. Let’s call this a *scene*.

With this in mind, imagine that the perceiver is herself one of the objects in the scene *S* that she senses. She fixes a position in space indexically: *here*. The scene that she experiences is a rigid structure with place-holders that can be laid on top of objects in the three-dimensional space around her. Every object in the scene *S* has an absolute location fixed by the perceiver’s position. A given element of her perceptual experience, *Fxi* is true of an object *a*, if *a* occupies *L* in her scene *S* and *Fa*.

An important point to note is that though the locations in the scene are egocentrically located, the model that the perceiver builds up is objective, or allocentric, in the following way: since the distances between objects are given, and since these distances specify a rigid solid, the perceiver is able to distinguish between changes of location in the scene and changes of her own position. When she moves from one place to another, the orientations and distances of things change relative to her own position. On the other hand, the distances between objects stay the same, and thus the objective disposition of objects remains constant. If she stays in the same place, but objects around her change their positions, then, once again, the orientations and distances of things may change relative to her own position; however, the inter-object disposition changes, and this marks change outside her own world.

The content of a perceptual experience is determined by two factors. The first is the scene, which is a specification of how objects and their features are located relative to each other. This specification may be incomplete; not all the qualities of every object may be included in the perceptual scene. The second factor is an egocentric location. Objects in the perceived scene are identified as individuals by their location relative to the perceiver. (The perceiver may, of course, misperceive these locations at any given moment, but multimodal processes of active sensory investigation can correct such errors: see Matthen forthcoming.)

I said earlier that this model is somewhat idealized, since it assumes that the pair-wise distances between sensed objects is presented to the perceiver. The information that she possesses may be incomplete in this regard. She will need to build it up by moving around and actively exploring the scene. Moreover, a matrix of pair-wise distances will not differentiate among Kant’s incongruent counterparts (e.g., mirror images). The point that I am trying to make clear here is simply that absolute locations can only be presented in some such way from outside the image content of a sensory state.

### Deflationary Views of Content

It is hard to deny some form of image content for perception. It is certainly possible to contest some of the details given in earlier sections, but at the very least it cannot be denied that the senses non-inferentially afford us information regarding sensory property-instances arranged in a perceptual field. Many of the details of conditions 2-4 of section II can be contested; however, it is difficult, with any degree of plausibility, to reject these conditions out of hand. It seems uncontestable that sensory awareness involves the presentation of feature-placing structures—that is of objects and feature instances distributed in space. The protocol statement view seems to capture at least a minimal specification of content.

*Deflationary* views of content hold that perceptual experience is incapable of representing propositions. According to what I shall call the *No Content View*, perceptual states express nothing at all. According to *Naïve Realism*, perceptual states do not represent *objects*: rather, they are *relations* to mind-independent objects. In conclusion, I want to look briefly at these two views, in order to examine how they might be modified to accommodate image content.

Before we continue, let me summarily dismiss the Epicurean view that perceptual experience is merely an impressed image, merely a causal trace of external objects that the perceiving subject may utilize to draw conclusions about the external world, but in no way a state that can be assessed as true or false. Of course, perceptual experience *is* the causal trace of an external object. What Epicurus (understandably) failed to recognize, however, is that perceptual experience is not *merely* an impressed image. It is rather the result of sensory systems (rather than the person of the perceiving subject) extracting data from the stimulation of sensory receptors. (See Matthen 2005 for an extended discussion.) Thus, for example, the impression of distance and three-dimensional shape is extracted from the retinal image using a variety of cues, including binocular displacement, brightness gradients, texture, and other such characteristics of the retinal images. Perceptual experience is how sensory systems *record* and *make known* the results of content-extraction from these impressed images.

This said, one should acknowledge a core truth in the Epicurean position. Sensory systems extract content from impressed sensory images in a relatively inflexible way. The perceiving subject needs to take account not only of perceptual experience, but also of other evidence, some of which has to be weighed up in ways that are not pre-determined. Suppose that some surface in a department store looks electric blue, but that you have read about the amazing perceptual illusions that this store uses in its interior design. By how much will you discount the appearance of blue? This, unlike sensory processing, is indeterminate and a matter of free choice. Nevertheless, perceptual experience should be construed as conveying a message, minimally a message about “protocol” qualities and their predication of located objects. This is the best way to conceptualize the interaction between experience and epistemic evaluation.

Given how well established sensory processing is, we should treat contemporary deflationary views as fully informed about at least the outlines. Anil Gupta’s (2006) No-Content view of experience, though reminiscent of Epicurus, is based on an epistemic distinction between perceptions and judgements. In assessing his views, it is charitable to grant him full knowledge of recent cognitive science of perception. In that spirit, let us look at what he says.

The given in my experience of, say, looking at a ripe tomato does not contain judgments such as “That is a tomato,” “That tomato is red,” and “I am seeing a tomato.” It is plain on reflection that my visual experience, when considered in isolation, does not entitle me to the judgement that the object before me is a tomato. . .

The second consideration is that experience is passive, and it is always a good policy not to assign fault to the passive. . . When I have what is called a “misleading” experience, experience has *done* nothing to mislead me. The fault, if any, lies with *me* and *my* beliefs—beliefs for which *I* am responsible. When on a foggy day, I take a pillar to be a man, it is not my visual experience that tells me that there is a man before me; the experience is ill-equipped to do such a thing. *I* form the belief that there is a man. (185-186)

It is difficult to make philosophical sense of these passages. Indeed, it is hard to resist the impression that they are intended as pseudo-Wittgensteinian goads that lead one, in irritation, to glimpse some deeper truth—and not as a philosophical argument at all. However this may be, they do not bear scrutiny on a literal construal.

Gupta says that perception does not entitle the subject to a judgement. (Presumably he means that it does not so entitle the subject all by itself.) This is true enough—that a tomato looks red is often not sufficient reason for judging that it *is* red. This may be a reason for saying that experience does not contain a *judgement*.But how does it show that there is perceptual experience does not contain, or represent, any *proposition*? Again, it is true that “*I* form the belief.” But this does not gainsay the fact that perceptual experience gives me reason to support specific beliefs and actions and undermine others. One could hold that it is the perceiver’s epistemic responsibility to take into account the reasons that might tell against a given perceptual experience. Thus, it is unclear why the claim that perceptual experience does not *contain* judgement carries No-Content force.

What is one to make of the injunction that one ought not to assign “fault” to the passive? (Is “passive” a remnant of the impressed image theory?) The fact that judgement is active tells me nothing about the veracity of perception, or the lack of it. Finally, even if perceptual experience *did* tell you something, how it still would not follow that you are entitled to believe it: it could still be *your* fault if you did.

Now, it could be that Gupta is making the mistake, tackled in section III, of denying that an image expresses a proposition. More charitably, he is perhaps pointing to a gap between perception, which is imagistically presented, and judgement, which has sententially expressed content. And, as we have noticed, there are genuine puzzles about this gap.

If this is the problem, then one promising approach is to adopt a view like that of M. G. F. Martin (2010). Martin considers statements such as “That seems red,” and “That looks like an A380.” His claim is that these are “comparative,”—they compare the perceptual experiences that occasion these sentences to appearances of the states of affairs mentioned. I would parse Martin’s suggestion as follows: one experiences a certain image and recognizes a certain similarity between it and images of situations in which the contained sentences are true.

Extending Martin’s suggestion, sentential content can be explicated as follows:

Sentence *S* (partially) expresses the content of a sensory experience *E* if relevant worlds in which *S* is true resemble worlds in which the image content of *E* is satisfied by the relevant situation.

For example:

“That is an A380 taxiing out for take-off” partially expresses the content of my perceptual experience if worlds in which there is an A380 taxiing out for take-off resemble the image content of my experience when these worlds are looked at from my point of view.

Martin’s proposal helps address the problem of the relationship between sensory experiences, which are imagistic in nature, and linguistic reports of these experiences. The reports capture what the subject wishes to convey about the imagistic representation by means of a comparison. It is plausible to hold that reports like “That looks like an A380” and the underlying sensory image is that the latter resembles an A380 situation. It is reasonable to think that this similarity is apparent to the perceiving subject only as a result of learning. And it follows that a report like the above cannot be produced without the intrusion of a background theory. But this does not gainsay the fact that the image content on which they report is (a) propositional in character, and (b) theory-independent. Gupta’s position wrongly takes the theory-ladenness of sentential reports of image content for the theory-ladenness of image content.[[26]](#footnote-26)

### Concluding Remark about Naïve Realism

In this paper, I began by laying out certain characteristics of image content. These characteristics force certain expressive limitations on vehicles of image content. Since perceptual states have such content, but are not expressively limited, I inferred that they must have meaning outside the image. This raises difficulties for some deflationary views of content.

Let me close with a remark concerning Naïve Realism (Snowdon 1981, 1990; Martin 2006), the position that experiences are simply relations to mind-independent objects. The usual objection put to naïve realists is the argument from hallucination, which goes like this:

A perceptual experience of (a mind-independent object) *O* is phenomenally identical to some hallucinatory experience of *O.*

No hallucinatory experience of *O* is a relation to *O.*

Therefore, a perceptual experience of *O* is phenomenally identical to some experience that is not a relation to *O*.

Assuming that phenomenal character individuates experiences, it follows that it is possible to remove the object of a perceptual experience while leaving the experience unchanged. This is precisely what naïve realists deny.

I want to offer a modified version of the above argument.

*Shared Content Principle* Any perceived feature-placing structure could figure in the image content of perception or recollection or imagination.

States of recollection and imagination are not relations to their objects; it is possible to remove their objects without altering their image content.

Therefore, a feature-placing structure can figure in the image content of a perceptual experience even when the object of that experience is removed.

The basic idea here is that perceptual image content does not depend on actually existent objects and is not therefore relational. It seems to me that this conclusion is unfriendly to Naïve Realism.[[27]](#footnote-27)

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1. *Letter to Herodotus*, § 51 (= Long and Sedley 15A11). Note: ‘portrait’ = *eikon*. [↑](#footnote-ref-1)
2. X *perceives p* only if *p*: for ‘perceives’ is what philosophers call “factive”. In my usage, “perceptual experience” is experience *as in* perception, i.e., experience involving sensory qualia with the feeling of here-and-now as per (b). Hallucinatory experience *may be* perceptual in this usage, though hallucination is not perception, on account of its failing the factivity condition. [↑](#footnote-ref-2)
3. Hume distinguished perceptual experience (“impressions”) from memory and imagination by the “force and liveliness” of the former. He would have said that a state of affairs is experienced as “here and now” *because* the idea of the state of affairs is more lively, and is hence an impression (not merely an idea). It is noteworthy in view of the Shared Content Argument in section VI, that Hume defines perceptual experience in a way that is independent of content. [↑](#footnote-ref-3)
4. Tim Crane (2008, 467-468) argues that pictures cannot be asserted except by using non-pictorial means (or “symbols,” as he says). Taking a pass on ‘symbol,’ I agree. Crane thinks that this thesis gives him reason to deny that perception is a propositional attitude. My claim is that perceptual experience asserts an image of the here-and-now simply by virtue of being the kind of experience it is. It is for this reason that perceptual experience can be true or false. This is why it is a propositional attitude. [↑](#footnote-ref-4)
5. In an otherwise excellent discussion of images from which I have learned much, Charles Siewert (1998) suggests that a merely imagined scene could turn out to be true—for instance, when I imagine a unicorn and it turns out that there is a unicorn that exactly matches my image. I think this is a mistake. There was nothing in my imagining that conveyed to me that my image was an image of this or any other actual creature. [↑](#footnote-ref-5)
6. Christopher Peacocke’s (1982) notion of “scenario content” is restricted to such feature-location content, though it is less conservative than the empiricist tradition, inasmuch as it allows for perceptual representations of three-dimensional space. Austen Clark’s (2000) idea of located features is another example. [↑](#footnote-ref-6)
7. It was, moreover, a matter of debate among members of the Vienna Circle whether protocol sentences were descriptions of the subject’s own phenomenal state (and hence private) or of feature-instances in shared real space. Carnap seems to have started with the phenomenal interpretation and moved, under the influence of Neurath, toward the public space interpretation (Uebel 1992). I am taking protocol sentences in the second way. [↑](#footnote-ref-7)
8. Others object on the grounds that the program is foundationalist. But first, this might be historically false (Uebel 1993), and secondly, there is nothing wrong with foundationalism. [↑](#footnote-ref-8)
9. See, however, Elisabeth Camp (2007) for an insightful discussion of “Thinking With Maps.” Camp uses “icons” with conventional meaning to carry some of the weight of the informational content of maps; she is concerned with displays in which imagistic content carries only some of the representational burden. In this paper, I am concerned with pure image content—no captions, shading, and other such symbols with conventional meaning. [↑](#footnote-ref-9)
10. See Matthen 2004 and 2005 (chapter 12) for a fuller defence of the predication claim than is possible here, as well as an argument against Austen Clark’s (2000) thesis that features are merely placed in visual field-places rather than predicated of individuals such as material objects. A brief argument is given at the start of Section III below. [↑](#footnote-ref-10)
11. Xu (1997) argues that *material object* is the *only* sortal at work in visual perception. Her argument is meant to exclude finer sortals, such as *man*, but she doesn’t consider shadows and the like for which the rules of overlap and interpenetration are different. [↑](#footnote-ref-11)
12. My position is that sensory *image content* is “abstract” in the sense of Tye (2000), p. 62. That is, it does not involve particular objects. However, I hold that perceptual (and possibly recollective) *experience* is object-involving. [↑](#footnote-ref-12)
13. The complete set of feature-placing structures available to a perceiver at a time would amount to something like Peacocke’s (1982) scenario content, *adding* sortals to identify the subjects of feature attribution, and *subtracting* the assumption that the point of view is that of the subject. [↑](#footnote-ref-13)
14. Traditionally, the visual field was taken to be two-dimensional. For powerful arguments in favour of a three-dimensional field, see Austen Clark (1996). See also Matthen (2005), chapter 12. [↑](#footnote-ref-14)
15. Colin McGinn (2004) suggests (23) that imagined spatial matrices may have gaps. In other words, you don’t visualize the two towers as located side by side. I take this to be a case of visually imagining two separatespatial matrices. I think this is equivalent to McGinn’s suggestion. [↑](#footnote-ref-15)
16. Interestingly, music perception seems to present a kind of non-spatial motion (Charles Nussbaum, forthcoming). That is, it is very natural to think of harmonic progressions, rhythmic lines, etc. as moving. It’s difficult to give an account of this; I very much doubt that it is merely analogical. [↑](#footnote-ref-16)
17. Flavour is a very complex case, since its components come from a variety of receptors, some in the tongue, some in the nose, some in the face. All of these are synthesized into a single experience and “referred” to the mouth, or to the object in the mouth. (After tastes are in the mouth, but obviously not in any object.) [↑](#footnote-ref-17)
18. Peacocke: “A visual perceptual experience enjoyed by someone sitting at a desk may represent various writing implements and items of furniture as having particular spatial relations to one another and to the experiencer . . . A sensation of small (*sic*), by contrast, may have no representational content of any sort, though of course the sensation will be of a distinctive kind.” (5). [↑](#footnote-ref-18)
19. Batty (2010) distinguishes between *smell*,which is an olfactory property of the perceiver’s surroundings, and *odour*, which is a chemical substance in the air. [↑](#footnote-ref-19)
20. It is common among philosophers to collapse these into the two-dimensional projection of a shape—they say that a square viewed at an angle looks like a trapezoid—but see Matthen (2010b). [↑](#footnote-ref-20)
21. Compare Boghossian’s (1994) condition of *Transparency*: (a) If two of a thinker’s token thoughts possess the same content, then the thinker must be able to know a priori that they do; and (b) If two of a thinker’s token thoughts possess distinct contents, then the thinker must be able to know a priori that they do. I do not endorse this condition in its full generality. [↑](#footnote-ref-21)
22. The *Property Coding* condition excludes the kinds of devices suggested by Camp 2007 for map-like representations: for example, “A black (or other fully-saturated) icon [c]ould represent certainty that the relevant object/property is at that location” [163]. This would entail that *black* would represent both blackness and certainty. [↑](#footnote-ref-22)
23. Carey: “I assume that representations are states of the nervous system that have content that refer to concrete or abstract entities (or even fictional entities), properties, and events.” (*ibid.* 5) [↑](#footnote-ref-23)
24. I take the distinction between odours and smells from Clare Batty (2010); however, she argues that the object of olfaction is a “know-not-what”. [↑](#footnote-ref-24)
25. See McGinn 2004 for other such differences between perceptual and non-perceptual sensory experiences. [↑](#footnote-ref-25)
26. Gupta’s view is similar to Charles Travis’s (2004) view. Travis’s argument is considerably more complex and nuanced, but in the end, I think it too treats sentential expressions of perceptual content as if they were independent of underlying image content. [↑](#footnote-ref-26)
27. I am very grateful to Chris Gauker for detailed comments after a careful reading of the whole manuscript. [↑](#footnote-ref-27)