Vision, Vector, Veracity

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**Sensory Content**

To experience is to undergo a process, to be in a state of receiving input which affords information about our environment. For highly developed beings like ourselves, the inputs determining states of conscious sensory perception are among the most important for our survival. At first glance, these states seem relational, each being a situation wherein a percipient X is passively conscious of something Y--its object, subject-matter, or content--without any apparent effort. Of course, the briefest reflection convinces us that despite a seemingly passive reception of data from without, a good deal of interpretation goes into the making of perceptual judgments, as evidenced by their wide variance in the face of like sensory stimulation. One person looking at the slope of a mountain notices a patch of whitish stones; another sees a flock of sheep grazing. They are distinguished by their different reactions to similar input, whether or not these are best construed as inferences, interpretations, or, simply, differing degrees of attentiveness.

The relational description of perception raises the question about the relata. In particular, what is it that we consciously perceive? It is easy enough to say that we see, hear, touch, smell, portions of our environment. To "naive common sense," wrote Merleau-Ponty, my perception, especially, my visual perception, is like beam of light which, when directed towards external objects, reveals them as they are in themselves. This spotlight extends from me to them, revealing their spatial locations, attributes, and connections to other objects. For instance, as my visual awareness is directed towards the other side of the room, I see a person there, and I see how he is; seated, smiling, possessing two eyes, smoking. To perceive is akin to throwing a harpoon or casting a net, enabling us to reach out and cognitively ensnare external realities as they are "in themselves." For this reason, conscious perception helps us to maneuver successfully in our environment so that we may satisfy our desires and promote our survival and well-being.

While the metaphors of Spotlights and Ensnarement might be appropriate for some cognitive procedures, they do not fare well under closer scrutiny. For one thing, not all visual contents can be construed verbatim as external objects or processes existing in their own right, or even as the parts and surfaces of such realities. Mirages, mirror reflections, hallucinations, rainbows and, perhaps, the blue sky above, are obviously "content" for visual awareness, items that a subject is aware of, but they are not themselves physical objects in any ordinary sense. At the very least, the metaphors must
be restricted to cases of veridical perception. But even here we encounter a more telling limitation due to the elementary physics of visual perception. Light does not emanate from the subject, rather, from the objects of perception to the subject. In so doing, it travels in roughly straight lines, is reflected by the surfaces of physical objects, impinges on the frontal portions of the eye producing a retinal image which, in turn, excites the optic nerve to relay a message to the visual cortex of the brain resulting, somehow, in a visual perception. In different individuals, or in different species, the same electromagnetic stimulus can result in widely different perceptual content. The perception is a bodily event though the causal influences come from without, and to some extent, perceptual content is a function of what happens to an organism after stimulation has occurred.

Respectful of science and desiring a uniform account of content, the Cartesian tradition concluded that the appropriate relata of all visual experiences are dependent upon and unique to the percipient subject. Hence, contents are subjective, regardless if we describe them as "ideas" or physiological states. To explain how visual perception is so successful in informing us about the external environment, Cartesians proposed that because perceptual contents are the results of our causal interaction with realities outside us, they also represent those realities, that is, provide information about salient properties and locations of those things. Sensory contents are like maps of the environment that the organism follows in navigating, to some extent, "mirrors" of nature whose images resemble the fabric of the immediate environment. Some Cartesians, keen to preserve commonsense intuitions, added that while we are immediately or directly aware of subjective contents only, through them we indirectly perceive external objects and events (1).

Representationalism has been thought superior to the naive realism that takes external objects and events to be the items of direct awareness (2), but it has its own problems. How do we know if a particular content, or feature thereof, is not a distortion brought about by our bodily condition? Modern physics give little credence to the inference that visible physical objects possess the precisely delineated figures and boundaries familiar to our visual contents. It is closer to the truth to recognize that the body functions as a modifier of sensory input, perhaps sometimes as an amplifier that preserves gross structural features of the input while on other occasions as a genuine transformer. What is essential for successful action is not that perceptual contents "mirror" the environment, but that they are "correlated" to the characteristics of external reality so as to provide an organism with reliable cues to successful action. Whether talk about "representing" is still appropriate here (3), this account of perception remains subjectivist in according only an indirect perception of external realities by way of immediate contact with what is, properly speaking, one's own.

**Visual Demonstratives**

As scientifically sound as the subjectivist approach to perception might be, it is, in a way, quite incredible. Not only does it engender familiar skeptical problems, it leave us
eerily isolated. If our sole contact with external objects and events occurs only at our nerve endings which, in turn, set the nervous system into motion thereby yielding perception, then the external world does not enter into perceptual content itself, regardless if perception is a brain process or some other sort of psychological state. We are not directly aware of external realities then, but at best, can only infer their existence upon the supposition that our sensations are produced by external factors quite independently of our own will.

Is this believable? If anything seems apparent from the outset of our lives, it is that we are in the world with other entities—entities we eat, push, lift, love, hate, aspire to be with, etc.—and this overwhelming sense of a community of being is an oddity on the subjectivist view of perception. Some of our most important perceptual information concerns the spatial position and orientation of things vis-a-vis ourselves. Vision is our most precise and detailed means of spatial determination, though kinesthetic sensations are equally important in navigation, and our chief mode of spatial differentiation is through visual demonstratives. We place ourselves as being here and now, and we locate other items as there, then, beyond, a while ago, soon, to the left, above, and so on. Noticing my bookshelf, initially see it as something which is there or to my right in contrast to being here. Only subsequently do I describe its locale in relation to other objects. Likewise, sensory qualia are never given by themselves; I do not perceive an olive green patch simpliciter, nor olive-green in itself, rather a patch of olive green over there. Again, I hear a sound coming from beyond the wall, and even I describe it as coming from "the kitchen" the latter, in turn, is something whose identification involves indexical elements, say, the room I am now in, or the room over there, or the room next to this one. Demonstrative reference is a pervasive feature of our perceptual consciousness, indeed, perhaps all perceptual reference occurs via demonstrative modes of presentation. The very use of spatial demonstratives in delineating the structure of my optical array suggests that we are aware of an external order of things, indeed, external reality seems essential to the significance and semantic value of the demonstrative tokens. Most of what I immediately see is not presented as located within my body or here, otherwise the other demonstratives would be wholly out of place and it would remain a complete mystery how they should be such useful guides to behavior. The demonstrative texture of visual perception, in other words, appears to boost the prospects for naive realism.

We appear to be reverting back to the Ensnarement model of perception. What about our earlier concerns over rainbows, mirages, mirror images, and other sorts of illusory contents which similarly harbor demonstrative elements? Are we not assuming that perceptual demonstratives reflect our attempt to reach out and tag items external to us, and is this not fully implausible? While demonstrative reference seems to take us beyond our own skins, it is also true that the content expressed by any demonstrative reflects the perceiver's perspective, that is, the spatio-temporal locale occupied by and unique to that perceiver. If anything, one's demonstratively configured contents are radically perspectival and subjective, wholly lacking the publicity that we associate with external realities. If my this's and then's exist only because of the peculiar locale I happen to occupy, then my indexically determined contents must be mine alone, not the sort of
public objects that the denizens of the external world presumably are. There may indeed be demonstrative modes of presentation, but they are, just that, modes of presentation, attributes of the way one perceives, not of external entities themselves. Any attempt to revive naive realism on the basis of demonstratives is doomed to failure.

These two features of demonstrative reference, its outward character and its radical perspectivity, support a tension over nature of perceptual contents that is at the heart of the debate concerning direct realism. To resolve it demands a closer look at just what it is that we do perceive.

**Auditory Vectors**

Let us shift attention to hearing for the moment. Close our eyes and listen to what impinges upon us at any given moment. What is the immediate content of my hearing? Sounds, obviously, sounds of various pitches, volumes, timbres, and durations. Through these sounds we conclude that certain events are taking place, for example, that my computer is running or that the cathedral bells are ringing. Where does my hearing occur? Well, right here, where I am, where my ears, auditory nerves, and head are located. However, I do not describe what I hear by reference to what occurs within my body, nor do I locate the directly perceived sounds with the indexical 'here'. Instead, I notice that these sounds emanate from various locales around me, regions that I initially identify in demonstrative terms such as 'there', 'on this stage', 'in that corridor', etc. Paradigmatically, sounds are perceived as localized in various regions around me.

According to the so-called Projective Theory of Content, a subject reacts to sensory stimulation by projecting sensory contents into various regions within his or her sensory space. The projection is not arbitrary, since the auditory inputs are already structured and differentiated. The perceived sounds are projected into various regions in the surrounding environment from the "point of view" of the percipient subject. Through this process, immediately felt qualities are perceived as apparently objective qualities of external objects and sense-experience achieves its intentionality. Yet we do not project sounds in any intentional sense, and if projecting is something we "do" unconsciously then the projected sound must already be there within the bodily event of perception in order for it to be the object of a projection. It cannot be within auditory content divorced from all spatial orientation. Talk of "projection" is more appropriate at the judgmental stage of perception when one goes beyond immediate sensory contents in interpreting what the external realities are. It is more accurate to report that I "project" when I conclude from perception of a certain content as there in my sensory field that the content is actually a feature of a corresponding region in external world. Inaccuracy and vagueness abound at this level. What is particularly troublesome is that from a subjectivist standpoint, projecting a sound to a region outside our bodies is ultimately illusory, for in saying that a sound is at a certain locale, say, on the stage, we are actually making an error in judgment. The Projective Theory needs to be supplemented for, as developed, it is left unexplained why we make such projections in
the first place, and how it is that an apparently erroneous localizing of sounds is useful to us in our interaction with our environment.

As Whitehead indicated (note 7), the language of 'projecting' and 'localized at' is misleading. Rather than describe an immediate auditory content as a sound-located-at-a-place, it is more accurate to say that what we immediately hear are sounds coming to one from a particular region. Merely being located in a particular place is a scalar quantity which lacks any aspect of directionality, even though the place might be specified relationally, say, two miles due east of the centre of the Luxembourg Gardens. By recognizing a directional aspect to a heard sound we can acknowledge that it is located at the very place I am located when I hear it, but at the same time, note its vector-like quality so that the accurate description of an auditory content is of a sound-as-coming-from-a-locale. Our auditory language testifies to this vector character; we say that the sound of the radio is coming from or originates in the region over there, the kitchen, say, but not that it is in or at the kitchen. It is this an issuance or transmission of a sound from the point of origin to the perceiver that permits the description of immediate auditory contents as vectors.

Besides the magnitudes associated with the modalities of sound, at least three factors are paramount in vector character of auditory contents: (1) the perceiver's position or point of view (perspective); (2) the region of origin; and (3) the felt transmission of the sound from (2) to (1). Let us see how these underlie demonstrative reference.

A perceiver's demonstrative identification of an item or a region of reveals the perceiver's own role in the perceptual process since the referents and places are "referred to as items present in experience." For instance, hearing you describe a painting with the sentence "this is beautiful" I realize not only that beauty is said of what you call "this" but that the latter is an object of your direct encounter. All demonstrative reference is intrinsically perspectival in reflecting a subject's orientation towards an item or, conversely, a referent's position relative to the place and time of an experience. From your perspective, a here might be my there, your she my you, and within my own, a this differs from a that and one this diverges from another. It is not some generic demonstrative mode that invests a particular 'this' with its meaning, otherwise there would be no distinguishing one this from another. Nor is it merely the demonstratively identified place which constitutes the cognitive significance of one's particular this's, that's, here's, and there's, otherwise we could not distinguish my this from your that. Nor is it enough to add that perceiver occupies and has a grasp of a unique perspective, for this would not explain how one this could differ from another this when both simultaneously belong to the perceiver. What we require, in addition, is an implicit grasp of one's own point of view and of the demonstrated place in relation to that unique point of view, a relation that is itself manifested in auditory content.

This is still not enough my demonstrative identifications, since there are many places from which identical sounds might reach me and be referred to demonstratively by me. To differentiate them fully and thereby account for the full demonstrative particularity of sounds, I appeal to a difference in terms of the felt directions, and it is here that the vector
character of perceived sounds is manifest. The reason I can distinguish one sound as
being there is because it comes to me at my perspective from a specific direction, and the
reason an identical sound can be identified as originating from a different there is because
it is given with a distinct direction. Hence, the vector character of auditory contents is
more fundamental than the scalar property of being located at a region in my sensory
space. Conceptually, demonstrative identification moves from here to there, but what
makes it possible is the perceived transmission from there to here. What we hear is a
sound-vector, a sound--complete with a specific pitch, volume, timbre, and duration--
having a direction, that is, as issuing from a spatial locale. Spatial demonstratives have
meaning because of this directional aspect of auditory content.

Underlying this vector perception is a causal process of sound waves being transmitted
from a point of origin through a medium to the auditory receptors. The demonstrative
identification of the region of origin is possible only if the sound-vector is perspectively
presented to agent. Such presentation is not action at a distance, nor hearing at a distance.
Phenomenologically, our hearing does not reach out and grasp the sound but, instead, the
sound seizes us. Hence, I hypothesize that a felt transition of sound from a point of
origin, thus, as having a direction, is what makes demonstrative identification possible.

**Visual Vectors**

The Projective Theory of sensory qualia seems more suited to visual perception. What
could be more obvious than that visual qualities--colors, shapes, and their various
modalities--are perceived as located at particular regions? Phenomenologically, it is less
clear that there is any perception of a color, a shape, or a colored shape, as issuing from a
region, and the vector analysis seems less appropriate.

But there are reasons to sustain the analogy of vision to hearing. The causal account of
visual perception is structurally the same as that of auditory perception; in both cases
there is wave transmission from a point of origin to the region occupied by the relevant
sensors. That sounds issue from a locale is more noticeable. Perhaps this is because sound
waves move more slowly than light waves; while the sighting of a distant cannon firing
seems instantaneous, the time lag before hearing it highlights the felt transmission of the
sound. Further, the impact of a sudden force upon the sense receptors is more noticeable
in hearing than in seeing, particularly when preceded by relative quiet or when the sound
is comparatively loud. Yet, similar phenomena can be manifested in vision. When a
momentary burst of light is seen--a light is suddenly thrown in a darkened room, or
sailors catch a momentary light signal from a distant ship--there is also a sense of light
reaching one from a distant location. We perceive not only the flash but notice its impact
upon the body, felling ourselves blink at sudden flashes just as we flinch at loud noises.
Again, when light illuminates a darkened theatre we are, for an instant, confronted with
the shapes and colors which appear to us from short distances away. The very use of
'appear' is suggestive of transition.
More so than hearing, vision is dominated by prolonged continuity of a stimulus from a relatively fixed locale, and this contributes more to the description of visual contents as stable externally located objects. But were sound sources more stationary and continuous we would be more likely to view sounds as stable attributes of external objects in fixed locales. Conversely, were our vision dominated by flashes of light or by colored shapes moving rapidly in and out of our visual field, then we might very well develop a sharpened sense of visual transmission from there to here, and feel more confident that the flashes of light or the colored shapes are located here but as emanating from there. Hence, there is good reason to retain a vector analysis of visual contents.

**Process and Sensory Contents**

Return now to the question about the classification of immediate sensory contents and note, at the outset, that in classifying an immediate perceptual content as being F, we do not thereby assume that the percipient is aware that this content is F. In such a case, were we to report what the agent is perceptually aware of then our use of F-classification should be kept external with respect to what is ascribed. For example, if I describe the man you see sitting in the corner as the Dean of the college, I do not assume that you realize he is the Dean. Linguistically, I would report what your say with the de re locution: the Dean is such that you see him sitting in the corner. Similarly, if subjectivists are correct in contending the immediate contents of perception to be "ideas" or "subjective," it is not assumed that perceivers are aware of this.

What general metaphysical description of auditory contents does the vector-analysis suggest? What, in terms of basic ontology, is a sound-coming-from-a-region? Despite talk about hearing the bell ring, or hearing so-and-so yell, we cannot reasonably maintain that we directly hear external physical objects simpliciter, nor that we hear their parts or properties. If anything external is directly heard it is a process, an occurrence, or an event, say, the clapping of hands, the falling of water, or the pounding of a fist on the door. Why not anchor perceptual realism on this? What we hear is an external event which (i) has a point of origin in a region external to us, and (ii) makes itself felt through a sound-vector within percipients situated at different locales. J. J. Gibson, for one, speaks in this fashion:

Physical acoustics tells the man-in-the-street that sensations of loudness, pitch, and pitch mixture are in his head, and only because they correspond to the variables of sound waves in the air. He could not possibly hear a mechanical event; he can only infer from the data. But nevertheless he goes on hearing natural events like rubbing, scraping, rolling, and brushing, or vocal events like growling, barking, singing and croaking, or carpenter's events like sawing, pounding, filing, and chopping. Ecological acoustics would tell him that the vibratory event, the source of waves, is specified in certain invariant properties of the wave train. These properties (the transients for example) are the same over the whole field of sound waves centered on the mechanical disturbance and extending outward in the medium. Information about the event is physically present in the air surrounding the event. If the man is within earshot, he hears the event.
The situation is precisely analogous with vision though the intruding events are perceived through vectors of different quality. As with hearing, we are presented with qualities from a region, a phenomenon that inevitably involves transition. From these vectors, the existence, attributes, and locales of the enduring physical objects are inferred.

To be sure, our conception of the world as composed of solid enduring objects is more firmly based in the visual sense. But if we take the auditory sense as our lead, and realize that the perceptual process is initiated by transmission through fields, then we can readily subject visual contents to a process analysis as well. Impinging upon us in both cases is radiation brought about by oscillations in electro-magnetic fields, events we perceive through sensory qualities or modes of presentation. We have not evolved the abilities to discriminate among these oscillations, nor can we distinguish the droplets composing a wave crashing against the rocks or the molecules constituting our desks. It is the repetition of patterns of oscillations that create the impression that we directly perceive stable external objects, their parts, or their attributes. But when we view these objects in analogy with the continuous sound produced by a waterfall, we can steer away from this conclusion. There is continuity in both cases, and it is the repeated perception of similarly textured events impinging upon us that is important for guiding our behavior, not direct awareness of objects as they are in themselves.

Does this return us to the Ensnarement Model of sensory contents? If hearing is a bodily event whose immediate content is something internal, why assume that we can reach out and directly perceive external events any more than we can directly perceive external physical objects whose adventures cause those heard sounds?

The answer is to rethink the ontology of events. Following Whitehead's lead, the first thing to realize is that events are not simply located, that is, confined to a single spatio-temporal region and involving no intrinsic connection to other regions. Rather, we should think of an event like a carpenter's hammering as originating in a specific locale and, from there, spreading out in a wave-like fashion to other locales. The physics of fields gives us the causal story of this transmission and of the effects that the hammering has as it is propagated through various regions. When the associated sound waves spread to regions containing an organism with auditory receptors, then the hammering itself is perceived from that organism's perspective. The hammering has a mode of being in the auditory reception, or, to use Whitehead's terms, it is objectified within the perceptual event. It is not just the nerve endings that are directly affected or immediately perceived, but the entire perceptual process within the body. The waves of energy that constitute the hammering have already been transmitted through intermediaries before they reach the nerve endings, and they continue to surge throughout the nervous system in generating the auditory perception. Because the hammering is manifested or objectified in the perceptual state, then we directly feel the hammering itself. Only the most rigorous dualism would treat the state of the auditory receptors as a direct effect of the transmitted event but the psychological state not.

The heard sounds, the perceived vectors, are private, for they are manifested in unique perceptual perspectives. Just as there is no sharing of perspective there can be no sharing.
of perceived vectors, only of vector-types, and this is principal insight of subjectivist accounts of perception. Yet, one and the same external event may be objectified in different percipients. There is a convergence of the points of origin of these distinct vectors--following my there might lead me into contact with you, physically or conceptually, as you follow your there--hence, the publicity of what we directly perceive. Because of our practical ends, consciousness is typically focused upon these public regions, not upon the features of the bodily event. The body tends to be taken for granted in perception, though if we pay attention it is unmistakably there.

Far from returning to the Ensnarement model of perception, we advance to a type of Converse Ensnarement. We do not intrude into the world qua subjects, it intrudes into us-and into our perceptual content, not just into our nerve endings. Intrusion from a region is the causality underlying the perception of vectors. I hear a large crash off to my right, a vase falling off the table upon being jarred. Impinging upon me from that angle is a burst of energy, that event conveyed through various forms of radiation and manifested within me, in part, through auditory vectors. It is that event that I hear as it impinges upon me, not I upon it. With this analysis, we must drop the naive assumption that perception reveals external realities as they are "in themselves," apart from any relation to a percipient subject. In holding that we directly perceive external realities, however, a type of direct realism can be retained if we adopt the conception of those external realities as events whose fundamental field character is to spread out from a point of origin to occupy and be objectified in other regions by means of various sensory qualia. The perceived vectors are not merely attributes of the perceiving subject; being how external events are objectified in us, they are relational features of the events themselves.

**Veracity and Perceptual Realism**

This brand of perceptual realism "sophisticated," I believe, not "naive," since it does not hold that we directly perceive external realities as they are in themselves apart from their manifestations elsewhere. A modified subjectivism survives as well, for it is only the external realities as objectified in our perceptions--in bodily events whose point of origin is here--that constitute sensory contents. We cannot perceive the whole of the external event, nor the event "in itself" apart from its connection to ourselves. Even less so do we directly perceive the more or less stable "objects," confined in a way that events are not, though these remain the principal concern of our inferences and interpretations.

Of course, there must be room for perceptual error in any account of perception. Error occurs when one mistakenly infers the causal origins of the sound, for example, if I inferred that the original source of a given sound was the canyon wall from which it echoed, just as if I mistook a mirror image for my own body. While error does not negate the vector character of the perceived sound, it poses two philosophical problems. One is epistemological. Perceptual illusions are a fact; sensory content can be produced in ways that mimic perceptual processes which are "standard" with respect to successful behavior. There is nothing phony or unreal about the sensory content itself; it is as real and vector-laden as content produced in standard ways. But it is not equally reliable as a guide to
action because of its non-standard derivation. Veracity is chiefly a matter of when a sensory content is adequately correlated to external reality in a reliable action-guiding manner. When a content is veracious, we say it "represents" external reality though, as before, it is a distinct question whether representation requires resemblance.

We can check on the veracity of a given content by comparing it with the vectors from distinct contents, ideally, contents produced in distinct sensory modes. I hear voices emanating from the corridor. Are these the sounds of people in the corridor? I go look. I see a bent stick in the water. Is it really bent? I feel with my hands or I move the stick around to look at it from another angle. Thus, we can determine whether an experience is veridical through vector cohesion according to which a content with vector $V$ is reliably produced only if there one would have perceptions with vectors $V_1,\ldots,V_n$ were we to do actions of sort $A_1,\ldots,A_k$. Vector disparity is a sign of non-veracity as when one feels the straight stick which one has seen to be bent when submerged. Of course, systematic error is always possible, and perhaps no amount of perceived cohesion can generate infallibility. The greater the amount of vector cohesion, the more confident we can feel in our action. Such cohesion need not be a wholly private affair; the cohesion of the vectors of distinct perceivers can only enhance this confidence. Publicity, after all, is the principal mark of external reality.

The more significant challenge is ontological. How can it be maintained that we directly perceive external realities given the existences of illusory contents with such tight phenomenological similarities to the so-called veridical cases? The answer comes in two stages. First, we must remember that a content might by appropriately classified, say, as an external event, without the percipient grasping that classification. Second, we must recognize that the bodily event through which an external event is perceived is of a type that can be produced in other ways. For example, the watery-like shape of a mirage has the directional quality of coming from an external region. One still perceives an event or complex thereof even though the watery-like quality through which it is objectified is not produced in the ways such contents usually are. Had we been bombarded with such mirages throughout our conscious lives then we would not be as prone to judge "watery" the shimmer produced by light reflecting off flat surfaces at a distance. In other cases, such as echoes and mirror images, the usual paths of causal origin are diverted and the vectors are more indicative of intervening sources than the original vibrations.

The more difficult cases are dreams, hallucinations, imaginings, and vivid memories. Here, an immediate external stimulus is almost entirely lacking despite the presence of vectors within content, and there is less inclination to speak of a perception of external realities here, unlike the other cases. But then there is no sense-perception either, and no sensory content, despite the presence of sensory-like qualia. What is directly perceived is a set of bodily events in which the presented vectors are not objectifications of external reality. We may be unable to tell from the perceived content itself whether we are perceiving something external in addition to the bodily event, but this inability affords little information about the ontic status of immediate content. Hence, the failure of veracity does not refute the claim that sometimes we do perceive external realities.
Notes

1. D. Maclachlan, *Perception* Prentice-Hall, 1989, gives the familiar contrast: "... we directly perceive, indeed, only certain sounds and noises, but we may say that we perceive indirectly the things responsible for these sounds and noises" (12). The use of 'immediate' and 'direct' to indicate a type of perception survives in many contemporary discussions, see, for example, P. Snowdon, "How to interpret 'direct perception'" in T. Crane, ed., *The contents of experience* Cambridge University Press, 48-78, and

2. There is some uncertainty about the precise definition of so-called "naive realism." The usual account is that we sometimes are directly aware of external physical objects and events, but epistemological versions define naive realism as the doctrine that we can have non-inferential justification for beliefs about external objects (see, for example, R. Fumerton, *Metaphysical and Epistemological Problems of Perception*, Lincoln: University of Nebraska Press, 1985, chapter 3). One of the major figures in the recent study of vision, J. J. Gibson, attracted attention by describing his view as a type of direct or naive realism (*Reasons for Realism*, London: Lawrence Erlbaum Associates, 379). In explicitly opposing the sense-data theory, he elaborated his own view of perceptual experience as follows: "There can be direct or immediate awareness of objects and events when the perceptual systems resonate so as to pick up information" (380). This formula is somewhat vague, however, a point brought out by M. Henle, "On Naive Realism" in R. MacLeod and H. Pick, eds. *Perception: Essays in Honor of James J. Gibson*, Ithaca: Cornell University Press, 40-56, who writes of Gibson that "I have not been able to convince myself that he is, in fact, a naive realist" (40).

3. See K. Akins, "Sensory Systems and Aboutness," *The Journal of Philosophy* 93, 1996, 337-372, which describes the "narcissistic" character of sensory systems and repudiates the conception that there need be any preservation of the "structure" of external facts in sensory signals. Sensory systems are "pre-ontological," she writes, concerned more with the satisfaction of the organism's needs than with a faithful portrayal of external reality.

4. I use 'mode of presentation' to mean a set of features, perhaps relational, that enable a thinker to refer to or "pick out" an item for thought (see my essay, "Exports and Imports: Anaphora in Attitudinal Ascriptions," in J. Tomberlin ed., *Philosophical Perspectives 8*, Ridgeview Publishing Co, 1994, 273-292). I follow Castañeda in taking reference to be, first and foremost, thinking reference (see, for example, H-N. Castañeda, *Thinking, Language & Experience*, Minneapolis: University of Minnesota Press, 1989, chapter 1. In several writings Castañeda argued for the irreducibility of indexical reference, and was insistent that the sort of reference involved in immediate experience was indexical (see *Thinking, Language & Experience*, chapters 4, 6).

5. J. J. Gibson has popularized the use of the phrase 'ambient optical array' to describe the immediate contents of visual awareness. Each array is a pattern of different intensities of
light determined by the layout of surfaces which reflect that light and which, thereby, affords information about the objects (see Gibson, The Ecological Approach to Visual Perception, Boston: Houghton-Mifflin, 1979).

6. See, for example, the presentation of the projective theory in T. Balwin, "The projective theory of sensory content," in T. Crane, ed. The Contents of Experience Cambridge, 1992, 177-195. Baldwin writes: "... sensory qualities lead a double life--both as intrinsic qualities of experiences and as apparent qualities of the objects of experience. So the idea is that the intrinsic spatial reference of sense experience converts the subjective sensory quality of sense experience into the apparently objective quality of a physical object located before the subject. Thus, by projecting the sensory qualities of sensation out into physical space, sense experience attains that phenomenologically primitive intentionality, whereby a blue sensation becomes a sensation of blue" (185). A similar account is given by J. E. Cutting, Perception With an Eye for Motion, Cambridge, MA: MIT Press, 1991, 15-29.

7. Whitehead makes this point in writing about the geometrical relationships within sensory content: "In the usual language, the sensations are projected. This phraseology is unfortunate; for there never were sensations apart from these geometrical relationships" (Process and Reality, New York: Macmillan, 1929, 262).


9. This point is brought out nicely by H-N. Castañeda, "Indicators: The Semiotics of Experience," in K. Jacobi and H. Pape, eds., Das Denken und die Struktur der Welt, Berlin: de Gruyter, 1990, 57-93. See also Castañeda's Thinking, Language & Experience, chapter 4.

10. There are several who argue that the vector-analysis holds for visual contents as well as auditory. See, for example, B. O'Shaughnessy, "Seeing the Light," Proceedings of the Aristotelian Society 1984-5, 193-218 especially, 198-201; and A. Pellionisz and R. Llinas, "Space-time Representation in the Brain. The Cerebellum as a Predictive Space-time Metric Tensor," Neuroscience 7 (1982), 2949-2970.

11. See Castañeda's Thinking, Language & Experience, chapters 5 and 12, for in-depth discussions of the difference between the external and internal modes of attributing content. I have developed the distinction in "Exports and Imports: Anaphora in Attitudinal Ascriptions."

13. According to Whitehead, classical physics conceived of bits of matter as simply located, where simple location is defined in terms of two properties, confinement and externality. By the first, an object is confined in its existence, to a definite place (location in space) and to a definite duration (location in time). An object may change its place during its duration, but at any point (instance) in the duration it exists in just the place it occupies and no other. By the second, an object's existence in a given place and duration, "does not require for its explanation any reference to other regions of space-time" (Whitehead, *Science and the Modern World* London: Macmillan 1925, 49). The spatial and temporal relationships of a simply located object are external in being irrelevant to what the object is essentially. Since they are constantly spreading out from their place of origin, events are governed by neither the confinement property nor the externality property.


15. This view of immediate perceptual content is Whitehead's most radical departure from the standard conception, for example, that advanced by H. von Helmholtz in his 1868 lectures on vision where it is stated that we "directly apprehend" only "the changed condition of the nervous fibres" (H. von Helmholtz, *Popular Scientific Lectures*, New York: Dover, 119