

What is a Perceptual Mistake?

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Explaining what a perceptual mistake is poses severe difficulties for both the direct and indirect approaches to perception (more for the former). The attitudes toward perceptual mistakes of these traditional approaches are discussed and found unsatisfactory. Another view (assumed already by Aristotle) is presented. In that view perception under normal conditions is the criterion for perceptual truth. Generally speaking, normal conditions are those simple and natural conditions typical of perception in everyday life. Normal is a context dependent attribute. There are different causes for the emergence of abnormal conditions; they are connected to the environment, perceiver, and the activity of the perceptual system in the environment. Only some, but not all, perceptual mistakes have "positive" features of their own that differentiate them from veridical perception. A popular model for explaining mistaken (and veridical) perception, namely the computational model, is examined and found to have serious flaws which are absent in the normal-conditions view.

Traditional Attitudes Toward Perceptual Mistakes

The Direct Approach

The notion of direct (and accordingly indirect) perception has two major senses: (a) perception of the object itself and not of a mental mediator which represents it, and (b) perception whose creation does not involve mediatory cognitive processes. Both senses pose difficulties when explaining perceptual mistakes since these (and other types of) mistakes are commonly regarded as (a) not reflecting the properties of the object, and (b) due to a malfunction in the operation of the cognitive system.

The direct approach (in the first sense above) argues that we directly perceive properties of the objects themselves. But mistake is described as *taking one thing to be another*, to mis-take. In perceptual mistakes one (mis-) takes some properties which are not those of the object to be properties of the object—one perceives something other than the properties of the object. The very existence then of perceptual mistakes is problematic for the direct approach. Hence, no wonder that a traditional argument against the direct

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approach is the argument from illusions. This argument asserts that we directly perceive sense data rather than the object's properties; this is so since it is assumed that (a) in perceptual illusions we do not perceive the object's properties but something else (i.e., mental entities such as sense data), and (b) that veridical perception is similar in this respect to perception of illusions.

The second sense of direct perception—the absence of mediatory cognitive process—also gives rise to difficulties in explaining perceptual mistakes. The common sense view conceives of mistakes as being connected somehow to a malfunction of the cognitive system. The absence of mediatory cognitive processes in the creation of perceptual states prevents the direct approach from referring to activities of the cognitive system as the source of perceptual mistakes. If one explains perceptual mistakes by referring to malfunctions of the cognitive system, one must explain veridical perception by referring to proper function of the very same system. This seems to contradict the second meaning of direct perception.

In light of the above difficulties two primary options were adopted by supporters of the direct approach:

(1) There is no mistaken perception.

(2) There are false facts which correspond to mistaken perception.

The first option denies the existence of perceptual mistakes, and claims that what are usually regarded as perceptual mistakes actually belong to a different mental realm: either that of belief or that of imagination. Armstrong (1961), for instance, claims that when "we suffer from sensory illusion there is no object at all, physical or nonphysical, which we are perceiving in any possible sense of the word 'perceiving'. There is simply the (completely) false belief that ordinary perceiving is taking place" (p. 83). A sensory illusion, Armstrong argues, does not consist of perceptual stuff but of two false *beliefs*: the belief that there is a certain physical object in front of me and the belief that I am now seeing that particular object; "the occurrence of these two false beliefs constitutes sensory illusion . . . this is all that sensory illusion is" (p. 83). While Armstrong denies the existence of perceptual mistakes by identifying them with beliefs, Gibson (1979) tends to identify them with fantasy. He says that his "theory of information pickup makes a clear-cut separation between perception and fantasy, but it closes the supposed gap between perception and knowledge" (p. 258). Perception is knowledge because (among other things) it is not mistaken; in this sense both knowledge and perception are the opposite of fantasy.

It is not my aim here to criticize traditional views of perception; I rather present them along with an alternative view which seems more plausible. Therefore, I will merely mention, but not discuss in detail, a few points of criticism. Concerning the view that rejects the existence of perceptual mistakes I wish to point out the following considerations: (a) it is contrary to the common sense stand; (b) empirical evidence indicates that the same system that is involved in veridical perception is involved in mistaken perception as

well; (c) one can speak meaningfully about veridical perception only if one is able to speak meaningfully about mistaken perception as well; (d) from a phenomenological viewpoint, mistaken perception is, generally speaking, more similar to veridical perception than to either belief or sheer fantasy.

Another way to deny the existence of perceptual mistakes is to deny that perception has any epistemic aspect; that is, to assume that the proper domain for describing perception is ontology rather than epistemology. If this is indeed the case, as Turvey and Shaw (1979) argue, "then perception would be characterized as a state of affairs, and like other states of affairs that constitute the facts of the world (such as galaxies, water, living things, etc.), it would be necessarily true by force of existence rather than possibly true by force of argument" (p. 182). This claim has several flaws. One should not deny that perceptual states, like other states of affairs, can be discussed from an ontic point of view. But unlike galaxies and water, perceptual states also have an epistemic aspect which enables one to speak about their truth and falsity. Contrary to the phrase *true by force of existence*, truth and falsity are attributes used in an epistemic, but not an ontic, description. Galaxies and water are not true or false; they merely exist or do not exist. It is quite odd to deny the epistemic aspect of our major epistemic system.

In accordance with this stand, Plato speaks about a complete parallel between epistemic and ontic levels. Knowledge, which is always true, corresponds to the unchanging form "which is always the same, uncreated and indestructible." Opinion and perception, which are in some sense always mistaken, correspond to "that which is always in the process of becoming and perishing." Ignorance corresponds to "that which wholly is not" (*Republic*, 478-480; *Timaeus*, 27-28, 51-52). In a somewhat similar manner, Wittgenstein (1921/1961) speaks about negative facts and argues that one should "express a negative proposition by means of a negative fact" (5.5151). Those facts are not false facts, but still there is in this stand an attempt to find ontic correlations to the epistemic attribute of negation. In the same vein, Gibson (1979) claims that "if information is picked up perception results; if misinformation is picked up misperception results" (p. 142); that is, information and misinformation have similar objective existence (on Gibson's direct approach see also Ben-Zeev, 1981, 1984). The postulation of false facts is, I believe, a categorial mistake. There are some attributes (including the attribute of falsity) that belong only to epistemic states or entities. As I claim below something which does not make any cognitive claim and which does not belong to an epistemic realm of discussion, is neither true nor false.

I do not think that the above suggestions of the direct approach give satisfactory explanations of perceptual mistakes. Lacking such explanations the whole approach loses its plausibility. Later on I will suggest an explanation which is compatible with some basic tenets of both the direct and the common sense approaches; before this let us examine the explanation of perceptual mistakes offered by the indirect approach.

The Indirect Approach

In light of the two major senses of direct perception, there are two senses of indirect perception: (a) perception of a mental mediator which represents the external object, and (b) perception whose creation involves mediatory cognitive processes. The first sense of indirect perception was assumed by most philosophers since the 17th century, for example, by Descartes, Locke, Spinoza, and the sense-data philosophers to mention just a few. Thomas Reid presented a notable exception. Though the second sense of direct and indirect perception has its origin before Helmholtz (1866/1925) introduced his notion of unconscious inferences, it was only then that this sense gained a central place in psychological disputes. More recently this issue has become the focus of a dispute between the computational and ecological approaches to perception. (For the former see, e.g., Gregory, 1970; Fodor and Pylyshyn, 1981; Pylyshyn, 1980. For the latter see, e.g., Gibson, 1979; Michaels and Carello, 1981; Shaw, Turvey, and Mace, 1981; Turvey and Shaw, 1979.)

In light of the first sense of indirect perception, we directly perceive only mental signs which represent the external objects; we do not directly perceive the external objects themselves (see Locke, e.g., 1690/1959, II, 8, 8). If what we directly perceive are signs, and since a sign "need not be similar in any way to that of which it is a sign" (Helmholtz, 1878/1971, p. 87), then there is no place for mistakes in the awareness of these signs. Indeed, Russell (1948) argues that "there are in fact no illusions of the senses but only mistakes in interpreting sensational data as signs of things other than themselves" (p. 167). The denial of the existence of falsity in the senses is found in many other advocates of the indirect approach (see, for instance, Descartes, 1641/1955, pp. 251-252; Diderot, 1965, p. 329; C.I. Lewis, 1929/1956, p. 125; and Locke, 1690/1959, II, 32, 3).

The indirect approach explains perceptual mistakes by postulating, besides the stage of the pure product of the senses (or in another terminology, sensation), another stage (perception or mediate perception) which is the product of intellectual—or quasi-intellectual—process. Perceptual mistakes are due not to the activity of the senses, but to malfunction of those intellectual processes which interpret (compute, infer, judge, decode) the raw material presented in sensation. As in the direct approach, likewise in the indirect approach, mistakes are not to be found in the activity of the senses (namely, not in the immediate stage of sensation). But contrary to the direct approach, here there are two additional stages: that of intellectual processes and that of mediate perception—both account for perceptual mistakes.

Some modern proponents of the indirect approach (see, e.g., Gregory, 1973, p. 60) give up the postulation of an immediate perceptual stage (sensation) altogether and merely assume the existence of intellectual processes and mediate perception. For our discussion of perceptual mistakes this version

does not make much of a difference since both versions explain perceptual mistakes by referring to intellectual processes.

The indirect approach is clearly better suited than the direct approach to explain perceptual mistakes; it is closer to the common sense view and it does not have to deny the existence of perceptual mistakes. However, it has its own difficulties as well. The main difficulty of the first sense of indirect perception is the unwarranted postulation (as many philosophers have pointed out) of internal mental entities such as sense-data, which are supposed to be the immediate objects of perception. Strictly speaking, in this view there are not mistakes of the senses.

The main difficulties of the second version of the indirect approach is that it explains perceptual attributes (in our case perceptual mistakes) by referring to intellectual processes which are typical of a later and more developed system than the perceptual one; that approach explains perceiving as a result of thinking. However, since the perceptual system evolved before the thinking system (to which those intellectual processes belong), and since most animals still have only the former, it is implausible to explain the former as dependent upon the latter. This approach seems to duplicate the conscious mental realm into the unconscious one: it postulates a homunculus who first perceives the initial data and then, in light of its personal structure, analyses the data and arrives at some decision. Perceiving is explained here by duplicating later mental processes into an unconscious realm. However, a mere duplication of a system does not explain the system but pushes the problem to different places. Thus we now have to explain perception also, but this time the homunculus' perception.

Later I return to the explanatory value of unconscious intellectual processes for explaining perceptual mistakes. Meanwhile, I turn to the positive task of this paper, namely, explaining what a perceptual mistake is, while avoiding the aforementioned difficulties and preserving, by and large, our common sense stands.

The Normal Condition Criterion

Two Conditions for the Attribute of Truth/Falsity

The attribute of truth or falsity presupposes two conditions: (a) an explicit or implicit claim (assertion, description) must be made, and (b) there must be some criterion according to which the claim should be judged to be true or false. The first condition indicates that truth and falsity involve an epistemic (or cognitive) aspect. That is, something that is true or false involves a claim about some state of affairs. States of affairs should be understood in a broad sense, referring to more than merely physical states of affairs. The (mathematical) claim $-2+3=1$ can also be true since it refers to a state of affairs which is

defined by the mathematical framework. Chairs and tables, which do not have an epistemic aspect, cannot be true or false; they merely exist or do not exist. Also, many kinds of speech acts cannot be true or false since they do not describe any state of affairs. This applies, for instance, to questions, requests, orders, promises, pledges, apologies, and congratulations. Thus the question "What time is it?" does not describe any temporal situation. Accordingly, it cannot be true or false. We should note that all states of affairs have an ontic aspect (*viz.* their existence), but only some of them have an epistemic aspect as well (*viz.* an explicit or implicit cognitive claim). A chair has only an ontic aspect since it does not make any cognitive claim. An uttered or written assertion has both ontic and epistemic aspects. It has an ontic aspect because it is an existing state of affairs, and it has an epistemic aspect since it makes some cognitive claim.

Another condition for a meaningful dialogue about truth is the existence of a criterion of truth. The truth/falsity attribute is a normative attribute, and like other normative attributes it must conform to a certain norm or standard. It is meaningless to speak about a normative attribute which conforms to no standard. The existence of such a criterion (norm) does not mean that everyone who determines the truth of a certain claim can describe that criterion; one may have merely implicit knowledge of the criterion.

I now consider the above two conditions with regard to perceptual truth and falsity. The first task is to determine whether perceptual states have an epistemic aspect, that is, whether they make some (implicit or explicit) cognitive claim.

If we would limit our discussion to the physiological level underlying perceptual states, and refer to physiological processes as such, we would not be able to speak about truth or falsity. Epistemic attributes do not belong to a physical (or physiological) level of description, but to a higher level (e.g., not to the description of isolated atoms but of certain states and activities of some complex biological system). As Helmholtz (1878/1971) rightly claims, "there is nothing wrong with the activity of the organ of sense and its corresponding nervous mechanisms which produces the illusion. Both of them have to act according to laws that govern their activity once and for all" (p. 37).

The epistemic aspect should be looked for in the perceptual states and not in the physiological processes underlying them. I have indicated that advocates from both the indirect and direct approach to perception (more from the former) consider immediate perception to be a noncognitive state which cannot be mistaken. It is not plausible, I think, to consider the system by which we gain most of our knowledge as a noncognitive one. I believe that perceptual states can be discussed also on an epistemic level since they make (implicit) cognitive claims.

The cognitive claim implicit in perceptual states is that the properties one is aware of in these states are indeed the properties those *perceived* objects have. The claim is that what I perceive are indeed the properties belonging to the

objects and events in our environment when the level of description is the perceptual one. This is almost tautology, but it indicates that perception is a kind of knowledge. It is knowing the environment on a very particular level of description. At that level, the existence of a perceiver is presupposed (Benzeev, 1983, 1984; Fritz, 1960). When I see that the face of Tom is red and oval, I implicitly assume that indeed red and ovalness are properties of Tom's face (on that particular level of description). If this is not the case, I consider my perception to be mistaken. The cognitive claim implied in perceptual states refers to properties which exist (sometimes only) at the perceptual level of description. When I see a red apple, the implied cognitive claim refers to the property of redness and not to wavelength of 700 nm (though in most cases there is a good correlation between the two properties).

Taking into consideration the nature of the implied cognitive claim indicates the nature of the criterion for perceptual truth. That criterion should refer to properties within the perceptual environment (i.e., the perceptual level of description), and not to some correspondence between perceptual and nonperceptual qualities. This is so for the simple reason that the cognitive claim implied in perceptual states refers to the former and not the latter. Since each discussion of the perceptual environment presupposed the existence of a perceiver, the criterion for perceptual truth should refer to the perceiver as well. A criterion which is compatible with these requirements, and I believe is indeed the one used to determine perceptual truth, is perception under normal conditions. If, in a certain perceptual state, the perceived properties are compatible with the properties perceived under normal conditions, then the given perceptual state is regarded as implying a true cognitive claim.

Normal Conditions for Perception

Examples. Before I examine the normal conditions criterion in perception, I present some examples which suggest that we indeed use that criterion in everyday life. Seeing the car's size at a distance of 30 meters as different than its perceived size at a distance of 10 meters is usually regarded as a perceptual mistake since at these distances we normally have size constancy. However, if from a distance of 30 meters I do not see all features of the car that are seen from a distance of 10 meters (for example, I do not see the license number), it is not considered as a perceptual mistake since I normally do not see from a distance of 30 meters all features that I see from a distance of 10 meters.

Also regarding the so-called secondary qualities (colors, sounds, smells, etc.), normal perception is the criterion for perceptual truth. In color perception, for instance, the criterion is the perception one usually has under normal conditions of illumination. For that reason, in everyday conversations we hear expressions such as: "At first I thought it was purple, but then I realized that I was mistaken and actually it was blue." The perceptual state at the beginning was different from the state the agent usually has under normal

conditions. When the initial state is considered as implying that this is the color under normal perceptual conditions, it implies a false claim.

Is there a perceptual mistake in the case of a color blind person who sees as red what others see as green? If the context of consideration is the normal perception of that person, the perception is not mistaken. If, however, the context of consideration is the normal perception most people have, the perception is regarded as a mistake; we say that something is wrong with his or her visual system. The color blind person usually takes the first kind of context and so does not consider him/herself as constantly engaging in perceptual mistakes.

The case of a color blind person indicates that normal is a context dependent attribute. Something which is normal in one context may be abnormal in another. The context usually referred to for determining perceptual truth is the normal perception of a certain individual. But since perceptions of individuals within a certain species are to a large extent similar, normal perceptions are often referred to as perceptions which are typical, under normal conditions, of most individuals in the species. The context in which normal conditions are determined may vary from an individual agent to a species or even to many species. The choice of the context for evaluating perceptual truth is, in a certain respect, arbitrary, but once the context has been chosen, the conditions and features of normal perception are determined as well.

Causes for the emergence of abnormal conditions. Normal conditions of perception may be divided into three major groups: normal conditions in (a) the environment, (b) the perceptual system, and (c) the circumstances in which the perceptual system operates in the environment. Accordingly, there are three major types of circumstances in which normal conditions of perception are absent. These types, which are also types of causes for the appearance of perceptual mistakes, are the following; (a) poor environmental conditions for perception, for example, poor visibility or looking from a great distance; (b) poor conditions of the perceptual system, for instance, illness or fatigue of the perceiver, and (c) special circumstances for which the perceptual system is not structured to cope, for example, the Müller-Lyer illusion in which two equal lines appear to have different sizes when they in fact have different kinds of arrows.

In the first type of circumstance, the perceived object or event is not in optimal conditions for perception. There is no definite borderline between normal and abnormal environmental conditions (as well as other types of conditions), but there is no problem to indicate clear cases of normal and abnormal conditions. One meter is usually a normal distance for seeing while one kilometer is not. In many cases a rough borderline for such normal conditions may be the line within which perceptual constancies are kept.

The second type of abnormal perceptual conditions refers to cases in which the physiological or psychological structure of the perceptual system is far

from optimal. In many cases where the perceiver is ill or under psychological stress, his or her perceptual system does not function well.

The first two types of abnormal conditions are easy to notice; they were previously mentioned by Aristotle (see, e.g., *On Dreams*, 460b33ff; *Metaphysics*, 1010b1ff). But it is the third type of conditions to which most illusions discussed by psychologists belong. Here we are not concerned with merely the environment as such or the perceptual system as such, but rather with the particular way the system functions in its environment. The source of these mistakes may be characterized as misapplication of a perceptual structure (schema). Perceptual schemata, which are the structure of perceptual states, have been developed in a way that takes into account certain regularities of the environment. These regularities hold in most cases; hence the information expressed by the perceptual schemata are usually reliable and consistent. There are, however, exceptional circumstances in which these regularities do not hold—continuing to use the same perceptual schema may lead to perceptual mistakes. For example, if in our everyday life most inside corners are related to shorter lengths than the lengths related to outside corners, and if the perceptual schemata dealing with corners is structured in a way that takes this relation into account, it is plausible to assume that when this schema is also applied to cases where this relation does not hold (as in the case of the Müller-Lyer illusion), a perceptual mistake results. A psychologist who knows the way the perceptual system is structured can easily create circumstances that give rise to perceptual mistakes.

Normal perception. The normal condition criterion for perceptual truth is already assumed, I believed, in Aristotle's approach. Aristotle argues that "the same thing never appears sweet to some and the contrary of sweet to others, unless in the one case the sense-organ which discriminates the aforesaid flavours has been perverted and injured. And if this is so the one party must be taken to be the measure, and the other must not" (*Metaphysics*, 1063a1ff). Normal perception is the "measure" (criterion) for perceptual truth. Normal here means occurring naturally. The more natural a certain perceptual activity is, the greater probability it has for being reliable; otherwise, we would have systematic distortion of the way nature works. In a normal state of nature everything functions properly and the perceptual organs fulfill their purposes successfully. In Aristotle's view normal conditions are not determined by subjective standards—such as the feelings of someone—or statistical ones—such as the opinion of the majority (*Metaphysics*, 1009b1ff). They are, rather, determined by a biological standard of the objective conditions in which a species lives and acts. Under these conditions the perceptual system is best suited to detect the properties of the objects. A similar attitude which connects the reliability of the perceptual system to its normal functioning is found in the modern evolutionary approach. In that approach the reliable functioning of an adapted biological system should also occur under normal conditions—otherwise, the system would not be well adapted. In both the

Aristotelian and evolutionary approaches, perceptual reliability stems from the fitness, under normal conditions, of the system to the environment in which it operates (see more on Aristotle's view in Ben-Zeev, in press-a; Block, 1961).

Generally speaking, most ancient and medieval theories of perception assume that what is conveyed to the senses is knowledge of the reality itself and not of mental signs. Accordingly, the perceptual system has solid knowledge and not merely enigmatic data. Therefore, in these theories, Meijering (1981) rightly claims, perceptual knowledge is fallible "only under non-standard conditions which are limited in number and largely specifiable in advance. Consequently, most illusions of the familiar kind are 'naturally to be expected'. Perceptual error, therefore, is a local phenomenon, not a global disaster" (p. 22).

In a manner close to Aristotle's approach, Fritz (1960) characterizes the normal conditions for perceiving the "real" perceptual qualities. Those conditions we attempt to approximate in ordinary experience while trying to be reasonably sure of what things "really" are like. Fritz suggests four features of these conditions: (a) they are "minimal" conditions in the sense that they make as little contribution as possible to the final perception; (b) they provide an optimal point of view for perception; (c) they should be permanent, easily reproducible and not "special"; (d) if possible, they should be "neutral" between different senses; that is, the perception of an object by one sense should be consistent with its perception by other senses (this condition is not relevant to qualities perceived by one sense). Though there may be difficulties in using these criteria (especially the first one), they give us a general feeling of what normal conditions are. These conditions, Fritz claims, have greater stability and "are as simple conditions of perception as any that naturally obtain, they are as easily reproducible and as permanent as any" (p. 350).

Psychologists have also used the notion of normal perception. Thus, Helmholtz (1866/1925) speaks about "ordinary normal conditions" for viewing, and in the same vein Katz (1935) argues that,

We believe that we apprehend the genuine colour of an object only under certain particular conditions of illumination. Neither twilight nor direct sunlight presents the genuine colour of an object. We must rather choose an intensity of illumination such as there is in the open air when the sky is slightly clouded. We shall call such intensity of illumination *normal illumination*. (p. 83)

Similarly, Koffka (1935) speaks about normal orientation of the perceptual system. A system is normal, he argues, "not because of its greatest frequency, but because of its greatest stability" (p. 503; see also Epstein, 1977, pp. 10-11).

In many cases the notions of *normal* and *common* (in the sense of *frequent*) perception have similar references, but actually they have different senses. Normal perception is indeed more frequent than abnormal perception, but "this statistical aspect of the normal, far from being the cause of its functional

aspect, is its effect" (Koffka, 1935, p. 222). Of all possible organization, Koffka claims, the normal one is the most stable. Thus the normal becomes the most frequent because of its stability and not frequency. Normal is used here "in a descriptive and functional but not a statistical sense" (p. 221). Normal conditions are closer to *stable* and *natural* conditions than to *frequent* ones. Seeing the sun as a small ball is a common and frequent perception. However, it is not a normal perception since seeing from such a long distance is not a natural condition for the visual system.

Rejecting the assumed identity between frequent and normal can help us reject the claim that repeatability of a perceptual state prevents that state from being mistaken. It is assumed that since the repeated perceptual states are the inevitable result of previous circumstances, they are neither true nor false. Thus, Turvey, Shaw, Reed, and Mace (1981) argue that "to assume that the figure is appearing as it ought to appear is to deny the assumptions that legalize the claim of perceptual error" (p. 280; see also Russell, 1948, p. 167). The confusion in that claim is obvious. In a sense, all states of affairs are *as they ought to be*; the truth attribute has nothing to do with this aspect of the states of affairs. That attribute is related not to the way a perceptual state was created, but to its implicit cognitive claims. Similarly, if I record myself saying "Napoleon was the king of England" and then play it back, the state of the tape recorder is exactly as it ought to be. But still, if we refer to the cognitive claim made in it, we say that it is a false claim.

The repeatability of a perceptual state does not prevent it from being mistaken. A straight stick partially immersed in water is an illusion. The bent perception, as optical laws show, is the way a straight stick ought to be seen in the circumstances of transformations between the mediums of water and air. But compared to the way a straight stick is normally seen (e.g., when it is not partially immersed in water), the bent appearance is a perceptual illusion. The same goes for the Müller-Lyer illusion which does not change (or hardly changes) despite the subject's knowledge of it. Here the repeatability is not explained by optical laws but probably by cognitive laws. That perception is mistaken when compared to the normal perception of those two lines (i.e., without the special arrows).

The indirect approach to perception rejects the existence of mistakes in sensation because it claims that sensation is devoid of any content which may be mistaken. Conversely, I do not assume (actually I reject—see Ben-Zeev, in press-b; Ben-Zeev and Strauss, 1984) the existence of such pure sensation. It is not the existence of two different contents (pure sensory content versus this content plus beliefs) which determines the possibility of applying the truth attribute to perceptual states. Veridical and mistaken perceptions may differ, but this difference is a sign, not a criterion, of perceptual mistakes. To talk meaningfully about perceptual mistakes depends upon having an epistemic context of discussing perceptual states. When the context of discussion is limited to ontic considerations of whether some content exists or does not

exist in one's perceptual state, there is no place for that attribute. A perceptual state is the inevitable (neither true nor false) result of given circumstances. But when the context of discussion also includes the epistemic aspect, that is, the cognitive claim implied in the perceptual state, there is a place for the truth attribute. In the same vein, in the context of biochemistry, cancer cells are not pathological phenomena; in that context there is no place for normative attributes such as *wrong* or *right*. However, in a different context of discussion, for instance, a medical context, the very same cancer cells are described with normative attributes such as *pathological* or *malfunction*. The application of normative attributes becomes possible, not by changing the phenomenon, but by introducing a context of discussion which has some criterion for normality and abnormality.

We should be careful not to confuse the *causes* for the emergence of perceptual mistakes with the *criterion* for being considered as such a mistake. The former may be connected to factors outside the perceptual experience, but the latter has been defined within the perceptual experience; it is perception under normal conditions. The existence of some correlations—and other types of relations—between perceptual and nonperceptual properties does not abolish the perceptual criterion for truth and falsity.

Normal perception of the so-called primary qualities (size, figure, number, etc.) usually has high correlation with physical measurements. A certain object the size of which is twice that of another object is normally seen as twice as big. This correlation is understandable in light of evolutionary considerations. The perceptual environment should have, for the sake of survival, a high correlation with the physical world. Because of this correlation, measurements of physical properties may be a good indication for the way those properties are normally perceived. Thus, if two lines which are measured to be of equal length are perceived to be of different lengths, we usually consider it to be a perceptual mistake. Such a perceptual-physical correlation is more problematic in the case of secondary qualities since these qualities are outside the physical realm. Here the entities to be measured are unperceived ones, for instance, wavelengths. The existence, in many circumstances, of a physical way to determine perceptual mistakes does not change the claim that the ultimate criterion for perceptual mistakes is *perception* under normal conditions.

Furthermore, physical measurements cannot be the only criterion for perceptual mistakes since perceptual assessments are never as precise as physical measurements. I may perceive the length of a house to be about 20 meters, but not 21.326 meters as physical measurements indicate.

Toulmin (1961, p. 62) tells us that not so long ago jazz used to be contrasted with "good music" though there could be better jazz and worse jazz. However, these cross-type comparisons between jazz and other types of music were neither fair nor legitimate. Just as the question "Is this music good of its kind?" is distinct from the question "Is it 'good' music?", the question "Is this

a true perceptual claim?" is distinct from the question "Is this a true knowledge of the world in itself (or the physical world)?" The former question in each case refers to a certain context of discussion; within that context its meaning is derived. The latter question has a very broad context of discussion. In many cases, the broad context makes that type of question meaningless; usually, there are not many common attributes for describing such a context.

Do Perceptual Illusions Have Positive Features?

Can one determine perceptual mistakes by merely considering a given perceptual state, or should they be compared with other perceptual states? In other words, does an illusion differ, in terms of a phenomenological viewpoint, from a veridical perception? Merleau-Ponty (1962) thinks it does. He argues that there must be "some intrinsic characteristic" which distinguishes an illusion from a veridical perception (p. 294). Most indirect-perception theorists think otherwise; they believe that it is impossible to describe an illusion in positive terms (see, e.g. Prichard, 1950, p. 49). The only difference between the two is that the one corresponds with objective situation while the other does not (Rock, 1975, p. 390).

The criterion of normal conditions is a comparative measure: it compares whether certain perceptual properties are compatible with the way these properties are perceived under normal conditions. As such, this criterion does not refer to some intrinsic characteristic of the perceptual state. However, it is a different question whether most illusions exhibit some features which are usually absent from veridical perceptions. The difference here is between a norm and features which suggest whether or not to apply the norm. Similarly, the norm "Do not lie" is not identical with behavioral features typical of people who lie (e.g., excitement, blushing, lowering the eyes, etc.). These features can help us to detect lies, but they constitute neither the moral norm "Do not lie," nor the criterion for lies. To return to our discussion, we are now looking for those features which may enable us to detect in many cases perceptual illusions; that is, we are looking for positive features for describing illusions. Let us first examine an empirical research in this issue.

In a study of two geometric illusions (Richer, 1978)—Orbison and Hering illusions—it was found that those illusions appeared to have an unusual character: they seemed to be unstable, and to fluctuate or vibrate. They were perceived as having some kind of "fault" in their organization. Their exploration, Richer argues, does not result in progressive determination.

These results are not surprising. A perceptual state expresses some kind of equilibrium of the perceptual system (or of various perceptual schemata). Since illusions take place in abnormal conditions for the perceptual system, then very often this system does not reach its equilibrium; consequently, the illusions seem to be unstable or to have some fault in their organization. Though the system applies some of its schemata, it is not a case of clear

application; other schemata may be applied as well. Because the perceptual system is not well adapted to abnormal conditions, its activity in those conditions is not very smooth or well organized. Therefore, features of perceptual illusions are easily changed by slight changes in the perceptual circumstances; for example, changes in the perceiver's focus, attention and mood or changes in the illumination or perspective. Indeed, normal conditions have been characterized as not "special"; that is, slight changes in these conditions do not alter what is perceived. When the perceptual system is able to perceive the object from various perspectives and circumstances, and thereby overcome the abnormal conditions, the illusions usually disappear and a perceptual stability is reached. The stability of normal conditions is therefore greater than that of abnormal ones.

There are however also cases of perceptual mistakes in which the positive features typical of illusions (and of dreams as well) are absent and the illusion is quite similar to veridical perception. Usually, in those cases the conditions are abnormal not in the sense that they are uncommon, but in the sense that the perceptual system is not structured to operate in its usual way. Thus in seeing the sun as a small ball the conditions are abnormal since our visual system is not structured to be accurate from such a long distance. Our perception of the sun is quite stable since the only abnormal condition in that case is the distance, and this distance virtually does not vary with most changes of other perceptual circumstances. However, when the perceiver seems to assume that this factor is changing—as is the case when the sun changes its place from the zenith to the horizon—the perceived size of the sun changes as well (see Kaufman and Rock, 1962). The more factors that are responsible for the abnormal situation, the greater the probability there usually is for the instability of the perceptual state.

In summary, there are cases in which perceptual illusions have "positive" features: their organization is unstable and they tend to fluctuate or vibrate. The instability and fluctuation in these cases, however, is not as noticeable as in the case of many dreams or fantasies where most temporal and spatial regularities are not kept. In this sense, perceptual illusions take a middle position between veridical perception and dreams or fantasies. There are also cases in which mistaken perception is closer to the former than to the latter. In these cases, mistaken and veridical perception are indistinguishable from a phenomenological viewpoint. Perceptual mistakes may have—but not must have—"positive" features.

It is interesting to note that contrary to our perceptual environment, a typical feature of the mythical environment is its instability. In that environment, "Nothing has a definite, invariable, static shape. By a sudden metamorphosis everything may be turned into everything. If there is any characteristic and outstanding feature of the mythical world, any law by which it is governed—it is this law of metamorphosis (Cassirer, 1944, p. 81). The development of the perceptual system from the mystical one to our own

involves greater stability of the perceptual environment. Such greater stability characterized the transition from dreams and illusions to veridical perception.

Perceptual Mistakes and Cognitive Inferences

A basic tenet of the indirect approach is the assumption that perceptual mistakes are the result of inadequate unconscious inferences (computations, judgments, interpretations, etc). Although it is beyond the scope of this paper to go into a detailed criticism of this prevailing paradigm of cognitive psychology, I wish to present a few remarks concerning the connection between this paradigm and the issue of perceptual mistakes.

As mentioned above, the truth/falsity attribute presupposes a cognitive context; the system to which we attribute true or false claims must be a cognitive system. But (and here begins my dispute with the indirect approach), the cognitive system in question does not have to be an inferential system. The cognitive system involved in conscious thought processes is not the only available cognitive model. The criterion for veridical and mistaken perception is not (as assumed by the indirect approach) some specific (viz. inferential or computational) cognitive mechanism which is involved in the creation of perceptual states; the criterion is a certain context of description which evaluates cognitive claims that are implied in the perceptual states.

Unconscious inferences are not only unnecessary for explaining perceptual mistakes; their postulation creates severe theoretical difficulties. These are expressed in the cases in which despite our knowledge of the falsity of the perceptual content we cannot change that content. Seeing the sun as smaller than it actually is, serves as a classical example. If indeed perception involves unconscious inferences, why does not the perceptual system infer that the perception of the sun's size is false, and hence replace it with the correct perception? A plausible answer (see Fodor, 1983) to this difficulty might be that perception involves some autonomous inferential processes which are not influenced by acquired knowledge (such as that about the real size of the sun). The existence of such an autonomous system has obvious biological advantages. Since the system is well suited to the normal, and usually most common, conditions which occur in nature, it can provide fast information which, in most cases, is very reliable. Taking into account every bit of newly acquired information (such as the sun's real size) would make the system both slower and more susceptible to errors (since the new information might be wrong).

The existence of an autonomous subsystem in the perceptual system makes a lot of sense. The question, however, is whether this subsystem should be described as consisting of unconscious inferences or of something else. A typical feature of inferences is intentional deliberation. The subject analyses the data and after deliberation, which involves considerations of other sources of information, reaches a conclusion. The putative autonomous (and

automatic), unconscious inferences lack this typical feature and it is doubtful whether without it we can speak about inferences or judgments (see also Hirst, 1959, pp. 226-231). Rather, we should say that forces of perceptual organization (as expressed in some perceptual schemata) remain unchanged despite the contrary influence of one's knowledge and past experience. It is more natural to assume that a perceptual schema is not changed by such knowledge and experience, than that a conclusion of deliberate, inferential process is not changed in these circumstances. While the former is a more or less stable structure or organization (at any point in time) the latter is a product of a process which should take into account, in its intentional deliberation, all the available variables.

Conclusions

The alternative suggested here for the modern direct and indirect approaches to perception is basically Aristotelian: the criterion for perceptual truth is perception under normal conditions. This criterion was not so problematic for Aristotle since he assumed that what is conveyed to the senses is knowledge of a world which is essentially independent of the perceiver. In abnormal conditions perceptual knowledge is distorted and does not describe anymore the objective reality. Such a naive view is not plausible currently when it is realized that perceptual qualities presuppose the existence of an observer. [Actually, Aristotle's view is not that naive. He claims that though the potential existence of perceptual qualities is independent of the observer, their actual existence is not (*De Anima*, 426a20ff)]. In the modern, relational view of the perceptual qualities, normal conditions can no longer be characterized as those conditions through which true and objective knowledge about an independent reality is conveyed. Normal conditions themselves become dependent upon each perceiver and the whole notion of having a criterion (norm) for perceptual truth seems in jeopardy.

The suggested explanation of perceptual mistakes attempts to face these difficulties while keeping the criterion of normal conditions. However, normal here is not a universal measure, but a context-dependent one. Perceptual knowledge gained under normal conditions is not directed anymore at an independent, objective world, but a relational environment which presupposes the existence of an observer. In normal conditions the perceiver is in an optimal position to gain reliable information about his or her perceptual environment. This environment differs from the physical world, but the former is—in normal conditions—a very good source for knowing the latter (Ben-Zeev, 1984).

The suggested approach is compatible with the direct approach—since it does not explain perceptual mistakes by assuming mediatory entities or cognitive processes—and is close to the common sense stand—because it admits the existence of perceptual mistakes and relates them to the perceiver.

Together with the common sense and the indirect approach I assume that an explanation of perceptual mistakes cannot avoid a reference to the perceiver's cognitive system. However, contrary to the indirect approach, I deny that such a system necessarily implies mediatory cognitive processes such as unconscious inferences. Instead we may speak about cognitive attitudes—which are expressed in perceptual schemata—that shape perceptual states without being mediatory processes (see also Ben-Zeev, 1983).

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