

Two Proposals Regarding the Primary Psychological Interface

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Two proposals regarding what the primary psychological interface is are critically discussed. (a) One proposal posits an actual overlap of consciousness and reality. The parts of the physical world that are directly perceived, or "self-given" — given themselves in person — to perceptual consciousness, are also elements of that consciousness. Each such part is supposed to have a kind of double existence, in the physical world and also in consciousness. Against this view, I argue that perceptual awareness makes portions of the physical world self-given only in their being manifested or appearing in consciousness, whereas the portions themselves remain completely external to consciousness. (b) Other authors claim that the primary psychological interface is an animal's perceptual activity with respect to the ecological environment. But, this interface does not amount, for them, to the animal's perceptual awareness in the familiar, ordinary sense of the experiencing of things by means of the senses, or as theoretically conceived of by the act psychologists of the nineteenth century; rather, perceptual awareness is a feature of the animal's actions upon the ecological environment. Against this view, I argue that an occurrent perceptual awareness is a central, unperceivable product and part of a larger activity of perceiving (often perceivable in some of its other aspects or parts) and an element of the actual interface between reality and consciousness.

An Interface Between Consciousness and Reality

Overlap

Edmund Husserl's (e.g., 1913/1983) effort to identify what it is that is immediately given to us is the topic of an important chapter in the recently published *The Cambridge Companion to Husserl* (Smith and Woodruff Smith, 1995). In that chapter, Jaakko Hintikka (1995) argues that, whatever Husserl's

“self-given” — the given in itself in person — may actually be, it must literally belong to consciousness (i.e., to someone’s consciousness). Consequently, no “dichotomy” or “sharp contrast” can be drawn with respect to awarenesses and their objects insofar as the latter are themselves immediately given to us. According to Husserl’s view as Hintikka explicates it, an immediate awareness and its object would seem to constitute together some kind of unity. The latter is, to say the least, a problematic thesis from the perspective of the present article.

If it is indeed the case, as Husserl often states, that parts of the physical environment are themselves given to consciousness, it follows, according to Hintikka, that the distinction between consciousness and reality perforce breaks down: “What is immediately given to me will then at the same time be part of the mind-independent reality and an element of my consciousness. There has to be an actual interface or overlap of my consciousness and reality” (Hintikka, 1995, p. 82). At a certain locus within the mind, namely in consciousness, a part of the actual physical environment somehow manages to make an appearance in person. This is a paradoxical idea. The physical environment is held not merely to affect, by impinging on the sense receptors, how the mind’s functioning proceeds, but also to get itself extended, somehow, right into the mind.

The same understanding of Husserl is expressed in different words when Hintikka (1995) also states, “Reality in fact impinges directly on my consciousness” (p. 83). Quite clearly, “direct impingement” here has an intended reference to more than the producing of a direct effect (cf. James [1890/1950] on knowing; see below). Reality’s direct effect on consciousness is proposed to possess “dual citizenship” in the two domains (Hintikka, 1995). Reality so impinges on consciousness that this effect — if that is the right word for the product of their interaction — is simultaneously a part of both consciousness and the physical environment. “Dual citizenship” is meant to imply a kind of dual existence. An immediate object of consciousness nonmetaphorically exists both in the mind and externally to it at the same time.

The immediate effects in consciousness of reality’s direct impingements comprise (are the elements of) an actual interface or overlap between reality and consciousness. This intriguing line of thought may be pursued in two opposing directions (among others):

1. In the spirit of William James’s (1890/1950) understanding of psychology as a natural science, I ignore the first of these two directions of inquiry. I do not consider any (idealist) theses that proceed along something like the following lines: “The dichotomy between consciousness and reality breaks down completely, so that there can be no actual interface between them, reality being no more than whatever and however our consciousness intends it.” Such a thesis would be based on the argument that, if the self-given must

be a part of consciousness, it cannot be part of the physical environment as well. Also, such a thesis derives from the precariousness of all mediate knowledge of a physical environment if nothing belonging to this environment is self-given, if we have no experiential point of contact with it.

2. I proceed instead by countenancing the alternative view to the effect that the items self-given to our consciousness are not mere phenomena. We are not trapped in a circle of subjectivity. For the insights it may contain or help to generate, I shall consider the paradoxical thesis that there exists an actual interface, in Hintikka's sense, between consciousness and the physical environment. Parts of the latter reality are also, literally, elements of consciousness. But how can this be? How is this kind of "dual citizenship" possible? Can anything uncontroversially mind-independent nevertheless belong to consciousness? Can there actually be such a bridge in common between the two realms?

Contrast

A contrast with a by-far-more familiar epistemological position may help to clarify the notion of an actual interface that consists of an overlap of consciousness and reality. Under the heading of "the psychologist's attitude towards cognition," James (1890/1950) described an alternative that remains plausible and attractive to psychologists of the present day. Referring to the psychologist's attitude, James stated,

It is a thoroughgoing dualism. It supposes two elements, mind knowing and thing known, and treats them as irreducible. Neither gets out of itself or into the other, neither in any way is the other, neither makes the other. They just stand face to face in a common world, and one simply knows or is known unto, its counterpart. (p. 218)

James thereupon claimed that knowing requires a duplicate, that is, a specific inner construction that corresponds to whatever external thing is known. One knows that which one knows by mentally reconstructing it. To construct a counterpart is, presumably, to know the original indirectly — by knowing the counterpart directly, as the process of constructing the counterpart requires. Also, the external thing known indirectly must "strike the brain in some way" — a "signal" must go out from the external thing to the mind's brain — in order that there may occur the mental construction of a counterpart necessary for knowing the external thing.

Such knowing, which involves being "struck" from the outside and "construction" on the inside, is entirely compatible with a dichotomy according to which consciousness and reality do not overlap at any point. Any external thing that is known is not self-given, or given to consciousness in itself; rather, it is knowable only by a duplicative process that, it would seem, *must actually deliver to consciousness something else in place of the external thing,*

namely, the constructed duplicate. The latter may enter the stream of consciousness, but the external thing known by means of it remains wherever it is independently of consciousness. Needless to emphasize, the external thing is a portion of reality and not a construction by the mind. In fact, the external thing is, according to James, completely unaffected by the simple fact of its being known.

In contrast, according to Hintikka's understanding of Husserl, when the physical environment impinges directly on consciousness, there occurs a form of awareness that makes an external thing given in itself to consciousness. In the process of mentally apprehending the external thing, the mind does not construct a duplicate of the external thing; but rather, the external thing is, partly itself, proposed as "getting into" consciousness, notwithstanding the fact that the external thing remains where it is in the environment. The latter is a problematical idea, to say the least, and will occupy me for the rest of this first main section. However, I shall not comment on James's epistemological position, having introduced it here for the clarification that by contrast it may bring.

Locus

Describing the view addressed in Hintikka's (1995) chapter, one of the editors states, "Some aspects of the [physical] object itself — the "given" aspects — are part of the intentional content of the perception: a part of the [physical] object is thus a part of the [perceptual] act" (Woodruff Smith, 1995, p. 374). Not all aspects of the perceived physical object "get into" consciousness, into the perceptual awareness of it. The interface of reality and consciousness, the purported overlap between them, does not include more than something of the physical environment, that is, certain parts or aspects of the perceived portions of the environment.

So also, it is only a certain part of consciousness that makes up the interface of consciousness with the physical environment. Hintikka (1995) states on behalf of Husserl, "There is a level of consciousness ["one particular phenomenon of consciousness"] in which reality forces itself on us" (pp. 88–89). At this level of interaction, consciousness does manage to "reach the physical thing itself" (Husserl, 1913/1983, p. 89). The interface between reality and consciousness consists of those mental states, among James's succession of mental states constituting the stream of consciousness, that themselves either are perceptual mental acts or involve perceptual mental acts in their larger, more complex individual structures.

Perceptual mental acts are among those occurrences that I have called "awarenesses" (Natsoulas, 1992, 1995). Also, they are instances of Husserl's "intuitive" kind of consciousness with one or more parts of the environment

or body as their intentional object. Accordingly, as I see Husserl's view, a certain feature of individual perceptual mental acts serves as the interface with reality. This feature is (a) the locus, so to speak, within consciousness where a part of reality forces itself upon our consciousness or, equivalently, (b) that component or constituent of consciousness which reaches all the way out to the physical thing itself and renders it self-given.

This feature of a perceptual mental act has been called "intuition" or the act's "intuitive character." It is supposed to be that which makes it possible for those parts of the environment that the perceptual mental act renders self-given to manifest themselves in consciousness. Hintikka (1995) calls intuition "the medium of self-giveness;" and Husserl's concept of intuition refers to "whatever immediately gives us its object" (p. 87). Husserl uses the German equivalent of *intuition* (*Anschauung*) to refer to any and all mental acts, including the perceptual, that make something self-given. According to Husserl, there are also nonperceptual mental acts that render certain items (e.g., a mental act, a value, or an essence) self-given, but I do not discuss these "intuitions" in the present article.

Self-Giveness

Husserl (1900/1970) distinguishes intuitive mental acts from other mental acts in terms of their contents, specifically, in terms of a varying property of the contents of mental acts that he calls their "fullness." That is, the intuitive content of a mental act resembles the properties of the act's object, and can be more or less complete in this respect. However, as I brought out in a recent article (Natsoulas, 1996), it is not the degree of this resemblance that is responsible, according to Husserl, for the perceptual act's making its object in the environment self-given. Rather, those aspects of the environmental object that are immediately given to consciousness are the ones apprehended as being self-given in the perceptual act. Were the objects of a perceptual act not apprehended therein as self-given, this mental act would not be a perceptual act, but an act of imagination. A kind of reverse illusion would take place: the mental act would not take that which it was in fact apprehending to be itself there in the environment.

The apprehension of self-giveness, which is claimed to be essential for self-giveness, is the product of a kind of construal of, interpretation of, or meaning-bestowal upon the sensations that the environmental object produces in the mind. An evidently cognitive process transforms sensations into the appearings of environmental objects in perceptual consciousness.¹ I return

¹Although the "meaning-bestowal" is proposed by Husserl to take place without the exercise of concepts (see Mulligan, 1995, pp. 206–207).

to this part of Husserl's thinking in the subsection below titled *Hyle*; however, for greater detail, see Natsoulas (1996) and its sequel (Natsoulas, 1997).

Although the following fact leads to problems for the Husserlian account, problems that Hintikka (1995) does not mention, Hintikka rightly points out the posited impingement of reality on consciousness does not entail that a perceived physical object is "causally or ontologically dependent on its . . . manifestations in intuition" (p. 93). Indeed, just as James stated, the knowing does not create the known. Nor, for that matter, does an act of knowing typically modify the nature or character of that which is thereby known. Perceptual awareness does something else: it makes manifest part of a reality that is independent of the mind. Perceptual awareness may be said to bring into existence the appearing of its environmental objects, for these cannot otherwise be manifested. See the subsection below bearing the title *Manifestation* for further relevant comment.

Consciousness

But the question then arises: If the external thing is not ontologically dependent on the existence of the interface, how can this part of reality that is manifested in consciousness be itself, as Hintikka proposed, a "denizen" of the interface between consciousness and reality, and thus a "denizen" at the same time of both domains? Any "denizen" of consciousness must, it would seem, depend for its existence or, at least, for the existence of some of its parts or intrinsic properties, on the persistence of consciousness.

Consciousness, in my view, is a process or set of processes. It is not analogous to an environmental place. It is not a mental space — into which physical objects might be conceived of to enter and leave without their becoming transformed in any way. Indeed, there simply are no mental spaces. Surely, mental space is a mere metaphor. Where might a mental space exist? The brain is a denizen of the same physical space as contains the physical environment surrounding us. The idea of consciousness as a space, an idea which one does encounter among psychologists, has its basic purported reference to a phenomenal environment that one perceives in place of the physical environment. A reason for proposing such a space is the need to locate somewhere the phenomenal objects claimed to be perceived in place of physical objects — because the latter are located at a certain distance from the locus of awareness, across which distance, it is held, the mind cannot reach. Although we continue to be faced with the intractable, fundamental problem of how one manages to undergo awareness of environmental objects, this problem is not solved satisfactorily by proposing that what one has awareness of is something else. We then must explain how one has awareness of the latter; the problem of intentionality reasserts itself.

Another less than cogent reason for claiming that consciousness amounts to a mental space is the undoubtable fact that one may have awarenesses just as though one were looking into a space that is other than the physical environment surrounding one. However, it does not follow that a space which one seems to encounter is therefore actual, any more than the objects one imagines to reside in that space are actual because one imagines them. Note that, in my view, imagining, hallucinating, and dreaming are activities which crucially involve at their core quite real and sometimes very compelling awarenesses. Who, except for a behaviorist or eliminativist, would want to deny this general fact? See the subsection *Eliminativism* in the second main section of the present article.

The awarenesses that, in part, constitute the activities of imagining, hallucinating, or dreaming are no less concrete than our perceptual awarenesses are. They too fall under James's heading of "the most concrete thing for a psychologist." Moreover, I believe (as James did not) that all actual awarenesses, whether they are hallucinatory or not, are occurrences in one or another brain. However, awareness does not make it so. What the above awarenesses seem to be of — no matter how convincing the awarenesses may happen to be — may have never existed and may never come to exist (cf. Reed, 1996, p. 174).

Manifestation

Myriads of physical objects have the potential to manifest themselves in perceptual awareness.² However, whenever this potential is actualized, the respective physical object exists in no more than a single location. It is a denizen of one world alone, that world in which we ourselves breath and live. When we see a certain particular tree in the garden, it manifests itself in our perceptual awareness of it; however, the tree does not come into existence a second time, within our consciousness. As a result of our seeing a single tree, there remains only a single tree. Admittedly, the potential to manifest itself is the property of a physical object. Not all constituents of the physical world can do this (cf. Gibson, 1979/1986). But an element's belonging to the proposed interface of consciousness and reality is not the same as its possessing the property of having this potential. The interface is made up of actual occurrent manifestations of parts of the physical world.

A physical object can be simultaneously perceived by many people. But, surely, this fact does not entail that the physical object itself is part of as

²Cf. Gibson (1966); and Gibson (1979/1986):

The size-levels of the world emphasized by modern physics, the atomic and the cosmic, are inappropriate for a psychologist. We are concerned here with things at the ecological level, with the habitat of animals and men, because we all behave with respect to things we can look at and feel, or smell and taste, and events we can listen to. (p. 9)

many interfaces of consciousness as there are perceivers of the physical object. In what sense, therefore, is the self-given “identical with its target in reality” (Hintikka, 1995, p. 94)? My Husserlian answer to this question is the following, although it may not be Hintikka’s answer:

The perceived physical object’s multiple manifestations in perceptual intuition (across and within people) are all of them manifestations of the physical object itself, not of something else in its place. The physical object is itself the “target” in reality of all perceptual awarenesses of it. Perceptual intuition comprises the interface between the physical environment and consciousness because it is how the physical environment manifests itself to consciousness, the means by which there is “an actual input from reality to consciousness” (Hintikka, 1995, p. 98). A nonmetaphorical input into consciousness occurs because, in the concrete form of perceptual awareness, reality produces such modifications of consciousness that allow physical objects to be manifested in themselves.

However, although the manifestations of physical objects in perceptual awareness are manifestations of the physical objects themselves, the manifestations of physical objects are not to be confused with the physical objects that they manifest. Hintikka (1995) quotes Husserl as follows from an early work (1905–1909), although for a different purpose than mine. However, the quoted passage seems very clear in distinguishing two kinds of items, the mental manifestations of a beer bottle and the beer bottle that these manifestations manifest:

I see a beer-bottle, which is brown; I attend to the expanse of brown, “as it is actually given”; I exclude everything that is merely intended in the phenomenon and not given [in it]. There is the beer-bottle; it is such-and-such. I distinguish the beer-bottle appearances; I find an awareness [*Bewusstsein*] of an identity which runs through them. I realize that I express it through the words: The beer-bottle is [what is] always appearing; it appears as the same persisting [object]; the appearances are not the beer-bottle, which appears in them They are different; the beer-bottle is one and the same. (p. 99; Hintikka’s amendments)

Although Husserl is here taking notice of a beer bottle’s appearing in a perceptual phenomenon, this appearing is not the primary object of the perceptual awarenesses he is describing. Whereas the appearing of the beer bottle flows and changes as the perceiver even slightly alters his point of observation in relation to the beer bottle, the unchanging beer bottle remains what is perceived throughout these changes in how it is appearing. The appearing of the beer bottle is part of “the way we see” (Mulligan, 1995, p. 170) the beer bottle, that is, a part of the real content of our visual perceptual awarenesses of it, a part of the rich “phenomenological structure” (Woodruff Smith, 1989) of, in this case, our visual perceptual mental acts directed upon it.

Husserl is here attending to and describing the perceptual awarenesses which he is undergoing as he is looking at a certain physical object. He is attempting to ignore any parts of the phenomenological structure of these awarenesses that are not involved in making the perceived physical object self-given to consciousness. He distinguishes the constant intentional object of those perceptual awarenesses, which is a part of the physical environment, from the manifestations of the intentional object in consciousness, manifestations which would not exist in the absence of those perceptual awarenesses or their intuitional content.

The perceptual manifestations of the physical object are elements of consciousness whereas, in contrast, the physical object is an element of reality. In my view, perceptual awareness may qualify as an "interface" not because it is an overlapping region of consciousness and reality, but because physical objects impinge upon perceptual awareness in such a way that perceptual awareness makes them given in themselves to consciousness in the sense that they, and not something else, are what appear to consciousness. Thus, in a passage (also quoted by Hintikka) from a late work, Husserl (1929/1960, p. 57) treats as equivalent something's being self-given with its self-appearing or self-exhibiting. If one examines this "interface," as Husserl did in the quoted example above, one finds (a) perceptual awarenesses with a real content that includes the appearing of physical objects. One also finds (b) distinct from their appearances, physical objects as intentional objects of those awarenesses — not as included among the latter's contents. What we see is not confused with the way we see it, with the phenomenological structure belonging to each of the individual perceptual mental acts comprising the perceptual episode of seeing what we see.

Hyle

Hintikka (1995) brings out that Husserl became persuaded, especially by the fallibility of perceptual awareness, that "everyday material objects are not given directly to us in the relevant sense" (p. 95). Such objects are not, after all, what it is that is self-given to us. Rather, it is "hyle" or "hyletic data" — that is, sensations³ — that are actually self-given. Hyletic data are the "unstructured raw materials" which are the actual effects of the impingement

³However, sensations are typically treated as actual or potential objects of inner awareness; they can be taken notice of, even if they are considered unimportant in the explanation of perceptual awareness (e.g., Gibson, 1966). In contrast, as Hintikka (1995, p. 97–98) explains, hyletic data are "not structured into particulars, their properties, their interrelations, etc." They do become structured, but then they enter as ingredients into particular perceptual awarenesses; they are no longer hyletic data, but features of the contents of perceptual awarenesses.

of reality on the mind. At this point, I do not say "on consciousness" because these sensory raw materials are not themselves immediate objects of awareness. Our only awareness of them takes place after they receive their form by a process of construal, interpretation, or meaning-bestowal that lies outside of immediate awareness no less so than do those raw materials, the hyle, that the process structures.

Therefore, hyletic data are not self-given; to be self-given they would have to be objects of awareness, which they are not. Those processes by which amorphous hyletic data are transformed into manifestations of physical objects are not awarenesses. However, Hintikka describes Husserl as claiming that reality impinges on our consciousness only in the form of unstructured raw materials. Certainly, there is present in Husserl's thought this very kind of "impingement" on our consciousness, if we understand the word to refer simply to an effect that reality has on consciousness. Without this particular kind of effect, there would not be, in Husserl's view, manifestations in consciousness of physical objects themselves. But the "impingements" that produce hyletic data modify our consciousness indirectly; hyletic data are not self-given to consciousness.

Hintikka would seem to be in agreement with my point when he suggests that how our minds give structure to raw hyletic data is not part of the business of a phenomenologist, and that those Husserlian processes of structuring the raw hyletic data "are performed under the surface of our intentional consciousness" (p. 103). The business of a phenomenologist is consciousness, and the direct impingements of reality take the form in consciousness of the appearing of objects belonging to the physical environment. The objection that these impingements on consciousness are not direct, that they are mediated by the processing of hyletic data, is not an effective one, because no one has proposed that the physical environment can affect consciousness directly, that is, without first affecting something else. In James's word, the mind's brain must be "struck" for it to produce perceptual awarenesses of environmental objects.

A related objection is more difficult to deal with. It requires inquiry into the nature of the processing of hyletic data. One needs to know: Does such processing involve consciousness in some sense? If it does, then it could be objected that hyletic data are self-given and that they are the locus of reality's impingements on consciousness. A suitable answer would seem to be empirical and of the sort Hintikka (1995) provides as follows, to the effect that we never have awareness of hyletic data as Husserl describes these:

The testimony of many of the best phenomenological psychologists seems to suggest that our structuring and categorizing activities [whereby, according to Husserl, hyletic data are transformed into the appearing of environmental objects] are inaccessible in a stronger sense than Husserl thought. For instance, they tell us that in the most primi-

tive, unedited sense accessible to our conscious attention, we literally see objects, not a "two-dimensional continuum of colors and shades." For another example, David Katz [1935] has written that most people go to their grave without ever seeing purely phenomenological colors (called by Katz "spectral colors") as distinguished from colors already articulated categorially into colors of objects, colors of surfaces, colored areas of space, colors of light-sources, etc. (p. 103)

If immediate awareness of hyletic data is not possible, then Husserl must look elsewhere for the locus of the meeting of reality and consciousness, namely in James's stream of consciousness and, in particular, those basic durational components of the stream that are perceptual awarenesses or include the same. These would constitute the interface of consciousness and the physical environment, although not in Hintikka's sense of an actual overlap between them.

An Interface Between Animal and Environment

Option

The Gibsonian Thomas J. Lombardo's (1987) book-length study of the evolution of James J. Gibson's ecological psychology argues for a different psychological interface between reality and the individual than the one advocated in the preceding main section of the present article. Although Lombardo, too, makes reference in this connection to something that he calls "perceptual awareness," he emphatically refuses to locate "perceptual awareness" in the brain of any animal, including the brain of human beings. Nor does Lombardo consider "perceptual awareness" to be a type of basic durational component of James's nonphysical stream of consciousness.⁴ Before I address Lombardo's notion of "perceptual awareness," let me call attention to a preferable option that happens to be also available to him.

Adopting a Gibsonian orientation does not require a theorist to proceed as Lombardo does. Another Gibsonian theorist, Edward S. Reed (1996), properly distinguishes between his own particular ecological theory and other possible such theories. And Gibson (1979/1986) himself ended his final book as follows: "These terms and concepts are subject to revision as the ecological approach to perception becomes clear. May they never shackle thought as the old terms and concepts have" (p. 311)! Compatibly with Gibson's views

⁴Compare Gibson's (1979/1986, p. xiii) statement that "a regression to mentalism would be worse" than an adherence to behaviorism (as was not Gibson's intention). Gibson thereupon acknowledges with approval the phenomenological research of Albert Michotte and David Katz. And Lombardo (1987) gives these two extraordinary psychologists of perceptual consciousness credit for having influenced some of Gibson's more important experimental work (cf. Reed, 1988).

and mine (see Natsoulas, 1989, 1993), Lombardo has the no-less-ecological option of holding that perceptual awareness is (a) a certain familiar, common, and wide-spread kind of consciousness, namely, none other than "the experiencing of things" (Gibson, 1979/1986, p. 239) by means of the senses, and (b) a perceptually inaccessible component of the process or activity of perceiving, which is itself often perceivable in some part.

We cannot perceive any instance of perceptual awareness although we may perceive certain other parts of the particular example of perceptual activity of which an occurrence of perceptual awareness is a proper part. However, although perceptual awareness, in the sense of experiencing environmental and bodily things by means of the senses, takes place covertly, it does not take place privately in a distinct world. Rather, it occurs, just as Lombardo insists, in an ecosystem, which consists of a certain part of the same physical world in which all animals reside. Also, the identical perceptual awareness takes place, as Lombardo opposes, in a certain part of an animal that is crucially involved in the respective activity of perceiving.

From the fact that perceiving takes place in an ecosystem, it does not follow that all aspects of the process of perceiving must be open to public observation. Thus, although Lombardo (1987, p. 344) claims — in agreement with Gibson (1979/1986, pp. 54–55) — that stimulation is *not* among the intentional objects of perceptual awareness, Lombardo rightly considers stimulation to be a part of how the process of perceiving is constituted. Analogously, I propose that perceptual awareness is both a product and part of one or another activity of perceiving notwithstanding the fact that perceptual awareness is not publicly observable whereas perceiving often is.

For example, when we are visually perceiving, a central component of this activity, which the activity keeps producing as it proceeds, is visual perceptual awareness of, in some part, the environment or body or both. I argued in a previous article,

Both [the activity of] perceiving and perceptual experience (awareness) . . . are processes, or streams proceeding in time, with the larger one including the smaller one, as the larger stream creates the smaller stream by means of the complex processes that constitute the larger one's proceeding in time. As Gibson [1979/1986] stated without qualification under "A Redefinition of Perception": "Perceiving is a stream, and William James's [1989/1950, Ch. 9] description of the stream of consciousness applies to it" (p. 240). [Natsoulas, 1993, p. 251]

I submit that, as a Gibsonian (cf. Natsoulas, 1989, 1993), Lombardo is in a theoretical position to hold that an animal's primary psychological interface with reality is its perceptual activity because this activity includes as part of it

(a) exploratory or investigative action, by means of one or another perceptual system, that is directed upon the environment surrounding the animal;

(b) the obtaining of stimulation and the pickup from the latter of stimulus information that is nomically specific to particular real features of the environment; and

(c) at the core of the perceptual activity, that is, "embedded" within that part of the activity which proceeds in the brain, an ongoing stream of perceptual awareness having as its intentional objects items that are informationally specified by the obtained stimulation.

I believe this would put Lombardo on the right track, yet he would still remain faithful to his commitment to Gibson's (1979/1986) ecological approach to perceiving (cf. Natsoulas, 1989, 1993).

Eliminativism

However, as already indicated, Lombardo executes a very different theoretical move than the above. Lombardo (1987) objects as follows to the thesis that perceptual awareness takes place within the perceiver:

Awareness is seen within the [competing] causal chain model as an event within the chain, localized at its terminal end within the perceiver. Not only is this view dualistic, placing the mind within the animal, aware of nothing but its inner states (homunculus),⁵¹ it is founded upon a reductionistic error in its conceptualization of perception. (p. 330)

This error of analysis is supposed to result in, among other undesirable things, a misconceiving of the nature of perceptual awareness — as exemplified, Lombardo would say, by the entire first half of the present article.

Lombardo proposes that perceptual awareness takes place at a different, higher level of organization, namely at the ecological level of description of the animal in its environment. The assignment of perceptual awareness to the ecological level entails, among other things, that perceptual awareness must be publicly observable — as everything at the ecological level of analysis is proposed to be (see Gibson, 1979/1986, Chapter 1) — without having to open the animal's skull or to use instruments that show what is going on inside the skull. Perceptual awareness does not reside within the skull; we can observe the occurrences of perceptual awareness by watching an animal behave within its environment.

Similarly, Reed (1996), states, "There simply is no mind behind what animals (or people, for that matter) do. There are, however, actions that

⁵¹I shall not repeat here detailed arguments previously made against this claim of Lombardo's. See "Objection to Perceptual Awareness as Brain Process" in Natsoulas (1993, pp. 252–253). In making my case, I referred to, among others, Gibson (1970) on hallucinations and Sperry (1980) on brain theory.

embody specific kinds of awareness and other actions that do not" (p. 98). This statement appears in a section bearing the title "A New Definition of Awareness." In that section, Reed (a) hypothesizes that an animal's having some perceptual awareness of *x* is "necessarily involved" in any case of the animal's picking up stimulus information nomically specific to *x* and (b) claims that stimulus-information pickup is "tantamount" to perceptual awareness.⁶ However, no definition of awareness is explicitly provided, which leaves me to surmise that Reed is identifying the having of perceptual awareness of *x* with the picking up of stimulus information nomically specific to *x*. In order for an animal to instantiate awareness, nothing further than information pickup needs to take place. There is no mind behind what animals do, even when they are engaged in exploratory perceptual activity with the function of stimulus-information pickup.

The animal engages in one or another activity of perceiving and, Lombardo states, this activity takes place like walking within the environment and with reference to it. Lombardo (1987) goes on as follows:

Perception is a relationship between an animal and an environment — it is not a relationship between neurons and stimulation [nor] a state isolated and localized with the perceiver The brain exists within the body and is undoubtedly necessary for perception, but perception (or for that matter any mental function^[7]) does not occur in the brain. Perception occurs within an ecosystem. The only way to comprehensively describe what occurs during perception is to describe it at the ecological level of organization. (pp. 330–331)

I cannot resist asking rhetorically: How comprehensive can a scientific description of perceiving be if it omits entirely — for whatever methodological reason (e.g., proper descriptive level) — all reference to the flow of perceptual experience (awareness) which proceeds at the very heart of perceiving? Imagine the reaction of disbelief if a physical scientist were to announce that the Gibsonians have got their level of description wrong and that trees and flowers do not exist since such objects receive no mention in the correct account of the ultimate constituents of the universe. Not "comprehensive" but, rather, "eliminativist" is the more suitable characterization of Lombardo's radical theoretical effort. Based on an ideology of descriptive levels, certain occurrences in the natural world must be systematically excluded from consideration as though they did not exist.

⁶I have elsewhere (Natsoulas, 1993) written critically regarding three statements to the same effect that appear in two earlier publications of Reed's (1987, pp. 103, 105; 1989, p. 115).

⁷Cf. Reed (1996): "To the extent that young children have thoughts — especially playful thoughts — it is very easy to perceive much of what they are thinking" (p. 157). The word *perceive* is used here to refer to the pickup of stimulation specifying those thoughts that are perceived. No inferential process is implied; for the thoughts that are perceivable are, evidently, some kind of feature of the child's behavior.

Indeed, a regression to behaviorism may be underway. It will be recalled that some behaviorists spoke of thoughts, feelings, perceptions, and the like, but they identified these occurrences with some kind of stimulation or behavior or relation between stimulation and behavior. The latter were the only conceptual options that they allowed themselves; therefore, there could not be any awareness that was not a form of stimulation or behavior or a mixture of these. Reed (1996, p. 99) attributes cognitive psychology's failure to become a general psychology to its having "ceded much territory to the behaviorists," but then Reed goes on to insist that action and awareness are not distinct.

Contact

Although something called "perceptual awareness" is being proposed again — see the authors discussed in the first half of the present article — as the primary psychological interface, Lombardo's (1987) interface exists between the perceiving animal and its environment as conceptualized at the ecological level of organization. Given Lombardo's conceptualization of the ecological level, perceptual awareness must be externalized. Because perceptual awareness is proposed to occur at this level, it must amount to a relation between the animal and its environment. It cannot be, as Lombardo might be expected to hold, an occurrence in the perceptual system that the animal deploys. Instead, whenever an animal engages in perceiving, it enters therein into a perceptual-awareness relation with respect to one or another part of its environment. But what is the perceptual-awareness relation? Which relation is this relation?

The likely Gibsonian move at this point is not to answer the question, and to give an account of what is there to be perceived in the environment. This is what Gibson (1979/1986, Chapter 14) does immediately upon proffering "a redefinition of perception" according to which the activity or process of perceiving intrinsically involves "awareness-of," or "the experiencing of things." Gibson dwells hardly at all on perceptual awareness itself, on its intrinsic nature, or on how perceptual awareness qua experiencing is related to that which is being perceptually experienced. And this notwithstanding Gibson's (1979/1986)

(a) promise of "a new notion of perception, not just a new theory of the process" (p. 239),

(b) likening his new notion of perception to the notion with which the phenomenologically-sensitive act psychology worked (e.g., Brentano, 1911/1973), and

(c) describing perceiving as a "psychosomatic act" — as distinct from a mental act or a purely bodily act (as behaviorists hold).

The feature of awareness that Gibson means to pick out with *-of* in *awareness-of* requires more explanation than Gibson's minimalist description provides.

Lombardo too provides very little in this regard. He states, "Perception is of the environment, because the perceiver is within the environment" (p. 7). However, Lombardo does not propose that our visual perceptual awarenesses are *of* the light because we live within a sea of photic energy that serves as effective stimulation at our visual receptors. Analogously, perception need not be (although in fact it is) of the environment simply because we exist within it. We also exist within the world of physics, yet what we perceive is the environment at the ecological level of organization (cf. Gibson, 1979/1986).

Lombardo's italicized *of* would seem to have reference to something more than simply an animal's inhabiting an environment. In addition, having perceptual awareness is being in direct contact with a part of the environment; the perceiving animal is surrounded by the environment and, thanks to perceptual awareness, interfaces with the environment in a psychologically relevant way. Lombardo (1987) states, "The perceiving animal and the perceived environment interface with each other, rather than being isolated The term *interface* underscores the fact of contact. At the ecological level, nothing stands between the perceiver and the environment" (p. 331). The spatiotemporal patterns of detectable energy between these receptors and environmental objects and the effective stimulation at the sense receptors are considered to be constituent parts of the perceptual process and to proceed at a different, non-ecological level of analysis. Because they do not proceed at the ecological level, the perceiving animal is in direct contact with the environment by virtue of its activities of perceiving; what takes place at other than the ecological level of organization can be omitted in developing a characterization of the primary psychological interface.

Interfaces

Can it be theoretically sustained that perceptual awareness is an external interface between animal and environment; rather than an internal interface between consciousness and reality, as proposed in the preceding main section? A less radical, though still Gibsonian alternative compatible with the first half of the present article is the following. Perceptual awareness *derives* from information pickup. Therefore, awareness transpires further on along the perceptual loop as this loop runs through the nervous system. As I have previously stated regarding what goes on beyond surface contact,

Perceptual interfacing . . . will produce a stimulus flux, but it may not produce perceptual experience (awareness), or it will produce a number of different [possible] streams

of perceptual experience (awareness), depending on which variants and invariants of the spatiotemporal stimulus structure obtained are extracted. (Natsoulas, 1993, p. 255)

That is, perceptual awareness involves information pickup and more, including a kind of consciousness. If so, the Gibsonian approach can countenance two different interfaces at the same time.

1. There is the ecological interface between the animal and the environment, which consists of the animal's perceptual activities with respect to the environment as described wholistically at the ecological level of organization.

2. At the same time, the specifically perceptual components of the stream of consciousness — that is, those integral states of consciousness which are themselves perceptual awarenesses or include perceptual awareness in their more complex individual structures — would qualify as the interface between reality and consciousness.

Does perceptual awareness consist only of the pickup of stimulus information by means of one or another of an animal's perceptual systems — plus, perhaps, the resonance of the particular perceptual system involved as a whole to the obtained stimulation? Gibson (1979/1986) states, "The process of pickup involves not only overt movements that can be measured, such as orienting, exploring, and adjusting, but also more general activities, such as optimizing, resonating, and extracting invariants, that cannot so easily be measured" (p. 263). This would seem to mean that the process of pickup, understood as equivalent to the activity of perceiving, includes not mere information pickup, or the obtaining of stimulus information, but also includes a perceptual system's resonance to and isolation and extraction of particular informational features from the totality of stimulus information that the perceptual system picks up.⁸

So too, contrary to first appearances, the bare pickup of stimulus information is not likely all of what Reed (1996) has in mind when he states that the relevant perceptual awarenesses belonging to the participants in Lishman and Lee's (1973) "swinging-room" experiment are "dominated largely by what is *specified* by ecological information" (p. 58). What the picked-up information specifies is a certain portion of the participants' environment in the laboratory where the experiment is being conducted. Reed goes on immediately to refer to the "content of consciousness" without making explicit the relation of this notion to what he has just stated about the participants' perceptual awareness. He simply states that the content of consciousness "is derived largely" from specific stimulus information picked up

⁸Cf. (a) Reed (1989) on the mutually integrated "neural ensembles" respectively underlying perceptual exploratory and information-extraction skills. (b) Shepard's (1984, p. 149) mention of perceptual "mechanisms" that extract informational invariants from the available stimulus information.

from the environment and implies that such contents are not quasi-linguistic as cognitive psychologists and philosophers hold.

In commenting on Lishman and Lee (1973) as he does, I believe Reed is properly distinguishing, in a consistent Gibsonian manner, between the respective stimulus information available and that which an experimental participant has perceptual awareness of in the environment. However, from what Reed says, it also follows, like it or not, *that information pickup and perceptual awareness are not equivalent to each other*. In the experiment that serves as Reed's example, information pickup has to do with properties of the spatiotemporal structure of the light (i.e., variants and invariants of stimulation) projecting to the participant's point of observation. In contrast, perceptual awareness has to do with the perfectly stationary floor on which the participant is standing; under the experimental conditions, the floor seems perceptually to the participant to move although it actually does not. To use Reed's term, awareness is "dominated" by *what in the environment the picked-up information specifies*, whereas pickup is "dominated" by *the specifying information, which is a property of the respective stimulation*. Although I agree that pickup and awareness are both components of a single perceptual activity, this does not make them one and the same. Indeed, as Reed (1996) himself rightly states, "Perception *results from* an active process of obtaining and utilizing ambient (external) information that is available in the environment" (p. 25; italics added). He means an activity of perceiving by that "active process," and perceptual awareness by "perception."

Derivation

Suppose that, in addition to the pickup function, a perceptual system also resonates as a whole to the information that it picks up (Gibson, 1966, p. 271). A wholistic notion of resonance is implied, I believe, by Lombardo's (1987) insistence that stimulus information is "not transmitted from place to place within the nervous system," but rather it is "captured across, or better still, 'around' a circuit" (p. 321). In resonating as a unit, the perceptual system is affected through and through by information pickup, not merely at those external points where physical contact with the environment or stimulation occurs.

Stimulus information, we are told by Gibson (1979/1986), does not need to be processed but can be detected, insofar as it is there and can be obtained by the animal's use of its perceptual systems. When stimulus information is detected, the animal acquires it; the information becomes part of the animal. However, to possess certain stimulus information or to be like this information in part (e.g., resonance) is not equivalent to being aware of that in the environment to which the information is nomically specific.

We have already seen this to be the case in the above experimental example that Reed himself deploys. He uses that example to argue for the crucial role of stimulus information in what an animal can be perceptually aware of; as Reed expresses their mutual relation, awareness "derives" from picked-up information. Well and good, but Reed (1996) immediately adds to that conclusion another one, which he describes as "very radical." He asserts, "Thus, awareness is not an internal state of the mind or the brain, but an ecological and functional state of an animal making its way through the environment" (p. 67). Somehow, the implicit reasoning that brings Reed to this further conclusion proceeds along these lines: if perceptual awareness "derives" from an activity of perceiving that obtains stimulation and resonates to and extracts stimulus information from that stimulation, then perceptual awareness does not take place in the mind or brain. Surely, this does not follow.

Problematics

1. Reed (1996, p. 71) also holds that the brain is "an active mechanism for sampling a complexly structured environment," and environmental objects have to be "detected by my nervous system" if I am to behave with respect to them in a "functionally specific manner." The brain detects but it is the behaving animal that is aware. However, the evident identification of awareness with certain behavioral features creates new problems; such as: How can one's behavior itself, however precise and appropriate it may be, be an awareness of the part of the environment which one is acting upon or, for that matter, an awareness of anything at all? Does not one's behavior actually depend for the form and direction that it takes on (does not the behavior "derive" from) one's perceptual awareness of that part of the environment on which the behavior is directed?

2. Reed (1996, p. 98) recognizes that, depending on how sophisticated an animal's perceptual systems are, the animal can be having awareness of features of the environment with respect to which the animal is not behaving at the moment. Thus, not all perceptual awareness is a feature of the animal's current behavior. But then where is this broader awareness occurring? Of course, it is taking place as part of the animal's current perceptual activity; for example, an animal may keep looking around even while heavily engaged in some sorts of consummatory behavior. In other cases, however, it is difficult to tell what, if any, broader awarenesses an animal is having in a peripheral manner, so to speak. The animal may not look as though it is aware of anything else, although we may later develop evidence that it was aware of something else, other than the particular segment of the environment that it was acting upon. This evidence, which may require special tests to be acquired, is not equivalent, of course, to the animal's broader awareness that has already

taken place. But if this broader awareness was in fact unobservable at the point of its occurrence, where did it take place? In the animal's muscles or in its brain? Such awareness would seem to qualify, even for Reed (1996), as taking place "behind" the animal's behavior. Yet, surely, its unobservability does not "effectively [put the awareness] outside of nature" (p. 98).

3. In an earlier publication (Natsoulas, 1984), I brought out a certain problem that Gibson's ecological theory must face. All Gibsonians will agree that perceptual awareness is about the informationally specified part of the environment, not about the specifying stimulus information; a perceptual system detects variants and invariants of the spatiotemporal stimulus-energy patterns at the receptors, but gives to the animal awareness of something else. Reed (1983) recognized that there is a problem here for Gibson and his followers. He asked, "Why do we apprehend objects 'through' the optic array [which consists of light] and not the optic array" (p. 92)? However, I submit, an answer to this question will not be achieved by acting on a refusal to distinguish the activity of information pickup from the perceptual awareness that derives from it. The apprehension that is at issue is not behavioral; perceptual awareness is not a literal grasping. It is a psychosomatic act of a living observer (cf. Gibson, 1979/1986, p. 240), a stream of consciousness that proceeds at the heart of an animal's perceptual activity.

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