Perspectival appearing and Gibson’s theory of visual perception

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Summary. Although Gibson (1979) did not explicitly discuss the perspectival appearing of the ecological environment, his important ecological approach to visual perception can accommodate both (a) the stream of visual-perceptual experience that flows at the heart of the visual system’s total activity of ordinary visual perceiving (ordinary seeing), and (b) the dimension of the visual experiential stream that is the ecological environment’s perspectival appearing to the visual perceiver. In the present article, perspectival appearing is located at the level of brain centers of the visual system, where processes are determined by the spatiotemporally structured visual stimulus flux. And the stream of visual experience is interpreted as itself possessing a kind of perspective structure (as does the visual stimulus flux), including variant and invariant features that the visual system isolates and extracts from experience, producing the perceiver’s cognitive visual “awareness-of” (Gibson, 1979) the environment and self in the environment.

Introduction

Adopting an “attitude of introspection” (Gibson, 1979, p. 195), the perceiver (P) engages in visual-system activity different from ordinary seeing, and called by Gibson “viewing the world in perspective” (or “noticing the perspective of things,” p. 196; “reflective seeing,” Natsoulas, 1989b, 1990a). McKenna (1982) wrote of a mode of “psychological reflection” in which “one focuses upon subjective appearances,” and added, “It is in this type of reflection where the distinction between subjective appearances and actuality is first made” (p. 45). “Appearential consciousness” was McKenna’s name for the experience produced by, and “flowing through,” this reflective activity of the visual system. In contrast, Gibson (1979), commenting on “viewing,” did not advert to a stream of experience; therefore, the following is his best statement parallel to McKenna’s: “One can learn to view an object in perspective, or a whole vista ... all one does is separate the hidden from the unhidden surfaces and observe the occluding edges” (pp. 286 f.). Did not Gibson thus hold that unhidden surfaces appear to P?

I treated of perspectival appearing as intrinsic to visual experience (Natsoulas, 1989a), agreeing with Husserl’s (1913/1983) statement: “The appearing of the color, the sound and thus of any quality whatever of the object [i.e., of a particular tree in a particular garden] ... belongs to the ‘really inherent’ composition of the mental process” (p. 238). A stream of experience proceeds as an essential part of ordinary seeing (Gibson, 1979; Natsoulas, 1989b), and so perspectival appearing occurs in the natural attitude as well. Perspectival appearing does not require P’s taking notice of it; part of the ecological environment (Gibson, 1979) appears to P even in the natural attitude when just “straightforward seeing” (Husserl, 1925/1977) goes on. The environment is giving structure to energy at the receptors, and this continuously transforming and changing “effective stimulation” (Gibson, 1979, p. 56) yields a flow of perspectival appearing of the environment. P does not merely pick up information present in the flux; this stimulation affects the visual system qualitatively, producing an appearential flow.

P becomes aware of this flow by adopting an introspective attitude. P engages in viewing to have awareness of how environmental surfaces are appearing to P. I concluded a recent article as follows:

For example, as you approach a large surface [e.g., a wall], the surface’s structure appears to become magnified and progressively finer details emerge at the center. Or, surfaces or their textures will appear to move in the outflow pattern that Gibson emphasized, as you speed through the environment. When you become introspectively aware of the appearances, you do not stop being aware of the surfaces to which these appearances correspond. Indeed, you may be aware of the surfaces as stationary and rigid while their appearances flow and deform, and you take notice of this. (Natsoulas, 1989a, p. 92)

Gibson stressed P’s caring about the environment and P’s position in, movement through, manipulation of, it, not about subjective effects of stimulation; P is aware of the appearential flow only from occasional interest in experi-
ence. However, I recently argued that Gibson’s (1979) account of the visual control of locomotion almost explicitly introduces routine apprehension of the apparential flow (Natsoulas, 1990b). Here I introduce perspectival appearing into his theory from an angle summarized in the next paragraph. I apply non-Gibsonian apparential concepts as consistently as possible with Gibson to give appearing a strongly naturalistic context and because what perspectively appears is the ecological environment.

Travelling a path of observation, P’s activity of the visual system, interacting with a continuous succession of optic arrays, gives spatiotemporal structure to the flux at the receptors. This flux possesses both variant and invariant properties of perspective structure constituting information specific to properties of the environment and of P. The stimulus flux is itself information pickup. Beyond pickup, the system resonates to the flux, exemplifying at various levels the same information as the flux. Part of seeing is a stream of experience proceeding at certain brain centers. This stream, too, has a sort of perspective structure; it includes a flow of perspectival appearing, which has both persisting and changing properties analogous to stimulational-perspectival properties. Therefore, the system can isolate and extract invariants and variants in the experiential stream, which specify properties of the environment and P. This extraction at the highest centers is P’s awareness of environment and self.

The visual stimulus flux

Because Gibson (1979) neglected perspectival appearing, the following compatible statement does not fit naturally into his book:

In straightforward perceiving, everything of that sort [i.e., appearances] was already there, only our notice was not set toward it. Indeed, we lived through the appearances, but our attending notice went through them exclusively to the pole, to the thing itself and then to its pole of properties, to the color of the thing, shape of the thing, and the like. (Husserl, 1925/1977, p. 117)

For help in placing the apparential flow in Gibson’s theory, I turn to Gibson on perspective structure. After preparatory comment, I argue, in the next section, that changing perspective structure is actually a property of the stimulus flux. As P moves even slightly, his or her observation point travels through each apex of a continuous succession of ambient optic arrays; the receptors are consequently affected by a continuously changing pattern of light stimulation. This flux of effective stimulation triggers responses of the receptors, which affect further cells leading to brain processes. Gibson (1966) stated: “Instead of postulating that the brain constructs information from the input of a sensory nerve, we can suppose that the centers of the nervous system, including the brain, resonate to information” (p. 267). If the brain “resonates” to information specifying environmental properties, the flux and certain of its effects in the brain contain picked-up information. From what does the system extract information? “From the available stimulation” (Gibson, 1985, p. 228). Surely, Haber (1985) did not mean exactly the following: “Gibson has simply assumed that because these transformation rules [of the stimulus flux] are describable the stimulus information on the retina for the scene is the same thing as the perception of that scene” (p. 256). Different stimulus fluxes trigger different spatiotemporal patterns of firings at the retinal level and have different effects at the cortical level, especially isolation and extraction from available stimulus information, depending on P’s interests and purposes. Upon extraction, there occurs “awareness-of” (Gibson, 1979, p. 239), or P’s visually experiencing properties specified by information.

Objection: “To reduce perceptual awareness to states of the mind-brain is to fail to explain the phenomena at the level at which they need to be understood” (Blinder, 1986, p. 146). Blinder mentioned Gibson’s insistence that the stimulus flux does not cause visual perceiving, which is not a mental or bodily act. Gibson (1979) stated:

The presence of stimulus information cannot be said to cause perception. Perception is not a response to a stimulus but an act of information pickup. Perception may or may not occur in the presence of [stimulation and] information. (pp. 56 f.)

Perceiving is a psychosomatic act, not of the mind or body but of the living observer. (p. 240)

But Gibson did not imply that experience does not proceed in the brain. If he believed this, how could he discuss visualizing as he did? The visual system “can also operate without the constraints of the stimulus flux” (Gibson, 1979, p. 256); and so on (cf. Gibson, 1970, on hallucinations). Rhetorically, Gibson (1979) tends to treat stimulation as deficient for experience of environment and self; but his statements do not contain outlandish claims. See his chapter “The Relationship between Stimulation and Stimulus Information”:

The difference between receptors and a perceptual organ [is that] receptors are stimulated, whereas an organ is activated. (p. 53)

Stimulation by light and corresponding sensations of brightness are traditionally supposed to be the basis of visual perception ... Inputs of the retina are not sensory elements on which the brain operates. (pp. 52 f.)

Stimulation may be a necessary condition for seeing, but it is not sufficient. There has to be stimulus information available to the perceptual system, not just stimulation of the receptors. (p. 55)

When stimulus energy is transformed into nervous impulses, they are said to be transmitted to the brain. But stimulus information is not anything that could possibly be sent up a nerve bundle and delivered in the brain, inasmuch as it has to be isolated and extracted from the ambient energy. (p. 57)

What applies to triggering an isolated receptor cannot be said about the perceptual role of the spatiotemporally patterned stimulus flux. Isolating and extracting information depends on pickup, and surely the stimulus flux constitutes this pickup, even if the occurrence of a stimulus flux, too, is considered to be isolation and extraction, since many alternative stimulus fluxes, containing different stimulus information, did not occur. But the idea that stimulus information cannot be sent up a nerve bundle presents difficulty. Cannot spatiotemporal properties of the stimulus flux produce cortical effects specific to them? If they could not, much of the visual system would not be involved in seeing, nor would there be a stream of visual experience. Gibson