Lectures on Perception: An Ecological Perspective

by Michael T. Turvey, New York, NY, Routledge, 2018, 432 pp., 64.95$ (Paperback), ISBN: 9781138335264

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Routledge
Taylor & Francis Group

BOOK REVIEW

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It is often underestimated how revolutionary James Gibson's (1966, 1979/2015) ecological approach was in its time. First, it challenged the long-standing assumption that perception consists of a series of internal inferences performed upon impoverished sensory data. Second, with the introduction of a new notion of information and the concept of *affordance*, it provided a radically new way to conceive both the act of perceiving and what is perceived. Third, it reconceptualized psychology as an ecological science, focusing on the complementarity between organisms and their habitats. Finally, it made the body a central part of any explanation in psychology, anticipating most of the ideas of embodied cognitive science.

Nevertheless, it is beyond doubt that if ecological psychology is a well-established scientific theory nowadays, it is in part thanks to the work of Michael Turvey. Throughout his long-lasting career, Turvey has been a leading researcher in ecological psychology, promoting new and innovative developments in the theory and inspiring new generations of students and researchers.

Lectures on Perception (2018) is an attempt to summarize this extended career. The book is largely based on a graduate course on perception which Turvey has taught at the University of Connecticut for the last 40 years. The book is organized into three parts and contains 26 individual lectures.

Part 1 of the book comprises lectures 1 to 15. The book begins by clarifying the purpose of perception. According to Turvey, the primary function of perception is to coordinate an individual's activity with her surroundings. After this, Turvey explicates the distinction between direct and indirect perception. As he presents it, theories of indirect perception conceive of perception as a triadic relation: a relation that involves the perceiver (P), some object or property of the environment (E) that is the object of perception, and a third entity (M), which is a surrogate or a representation of E for P. It is this in-between surrogate (M) with which the perceiver is in contact, not the object itself, and P must infer E from M. In contrast, what makes a theory of direct perception is the assertion that P can perceive E without M.

For Turvey, direct perception is only possible if there is information in the world that is lawfully generated by and then specifies E. Turvey designates this information as "information$L$" to distinguish it from the kind of information used in communication theory (Shannon, 1948). The crucial difference between these kinds of information is that information$L$ is grounded in lawful relations and is specific to its source. Once one has specific information, Turvey argues, the necessity of performing perceptual inferences disappears, and so does the theoretical necessity of postulating an in-between entity that mediates P and E (Turvey, 2018, p. 30).

Why, however, is information$L$ not another candidate for M? What precludes us from thinking of information$L$ as a representation of E? Turvey offers two (presumably intertwined) reasons for the distinction between information$L$ and representation. First, "information$L$ is specific to the activity-related meanings of E" (Turvey, 2018, p. 37). This, however, does not illustrate the difference, for others have already theorized the

existence of representations with activity-related content (see, e.g., Clark, 1997). Second, whereas information$L$ is based on lawful relations, M is not. As Turvey puts it, "specificity of X to its source Y means that X entails the source by which X is entailed. . . . information$L$ is entailed by E and entails E" (Turvey, 2018, p. 38). I take this to be the crucial reason that justifies the distinction between information$L$ and representation (Segundo-Ortin et al., 2019). In short, because information$L$ is grounded in lawful relationships, it cannot misrepresent its source, thus failing to meet one of the few undisputed features of representations.

Once he has presented the basic distinction between direct and indirect theories of perception, the rest of Part 1 exposes the foundational concepts of the psychology of perception, as well as some of the most important explanatory issues this science has attempted to address since its inception. This first part of the book offers a pedagogical journey across the philosophy of some seminal figures of the discipline, including Berkeley, Locke, Hobbes, Malebranche, Descartes, and Hemlholtz, as well as a detailed analysis on the principles of Gestaltism – an approach that had a significant influence on Gibson's theory.

Part 2 (lectures 16 to 19) is exclusively dedicated to the modern computational approaches to perceptual psychology. These are presented by Turvey as the reincarnation of the Cartesian program. In this second part, Turvey pays special attention to Fodor's language of thought hypothesis (1975) and Newell and Simon's physical symbol hypothesis (1976). This helps Turvey to illustrate the theoretical principles that allegedly ground the computational-representational approach that dominates modern cognitive psychology (Turvey, 2018, pp. 238–239): (a) disembodiment, or the idea that cognition can be studied abstractly outside of perception and action; (b) the emphasis on explanatory models for cognition that focus on inference-like computation; (c) the idea that cognitive processes are language-like; and (d) the assumption that all varieties of cognition can be modeled and explained using the same type of architecture. This exposition is complemented with a critical analysis of the different proposed solutions to the problem of pattern recognition, and of Marr's theory of perception (Marr, 1982).

The final part of the book (lectures 20 to 26) focuses entirely on the ecological approach. As he explicates, a distinctive feature of the ecological theory of perception and action is that it rejects the organism–environment dualism that is at the heart of Cartesian psychology (Turvey, 2018, p. 316).[1] This rejection comes with an important consequence: namely, the ontology of the theory must be (re-)defined at the scale of the organism–environment relation – the so-called "ecological scale" (lecture 22).

Affordances – the opportunities for action that an environmental setting offers to an organism – constitute a typical example of such ecological entities. A fundamental hypothesis of ecological psychology is that organisms control their behavior by directly perceiving the affordances present in it. Detecting specific information, or information$L$, present in the environment suffices to perceive what can be done in it. By definition, affordances are organism-relative: the glass affords *graspability* to me because I have opposable thumbs, but it does not afford the same action to my dog. Yet, for Turvey, affordances are not just organism-relative properties of the environment. Rather, "affordances are dispositions of environmental layout that can be made manifest by reciprocal dispositions of organisms" (2018, p. 335). According to this view, an affordance Y of an object X is perceived by an organism Z just in case there are dispositional properties of X that are complemented by dispositional properties of Z. The dispositional properties of the organism are called "effectivities." Using Turvey's example, on the occasion of lacking protection of its shell, the hermit crab perceives a

sea anemone as a possible enclosure. However, if the crab lacks food but has protection, it will perceive the sea anemone as a possible food place. How the hermit crab perceives the sea anemone is thus given by a nomological relation that holds in virtue of the complementarity of the environmental affordances and the animal's effectivities. Turvey (2018) provides a formal description of this view:

> Situation *X afords* activity *Y* for organism *Z* on occasion *O* if and only if *X* and *Z* are mutually compatible on dimensions of relevance to *Y*.

> Organism *Z efects* activity *Y* in situation *X* on occasion *O* if and only if *Z* and *X* are mutually compatible on dimensions of relevance to *Y*. (p. 330)

After having presented his ontology of affordances, Turvey spends the final lectures explaining some crucial concepts of ecological psychology. Lecture 23 is dedicated to the notion of 'information' as used in the theory. Turvey contrasts the assumption that the retinal image is the basis for visual perception with the hypothesis that the information for visual perception is present in the structure of the ambient light. Then, he comes to address some well-known examples of perceptual illusions from the perspective of ecological psychology. The upshot of this analysis is that the very idea of perceptual illusion makes no sense once we conceive of perception as the direct detection of information*L*. Lectures 24 and 25 expand on the idea that perception is continuous with action by means of well-known experiments on optic flow and dynamic (effortful) touching.

The final lecture is dedicated to the notion of 'strong anticipation'. According to him, anticipation is weak if it arises from future-oriented mental representations, and it is strong if it arises from the dynamics of the whole O-E system. In the words of Turvey, "rather than ask how the future is produced from an internal model, one asks about a lawful coupling (between organism and environment) that result in coordination with the future" (2018, p. 413).

To understand how direct perception can give rise to strong anticipation, we have to consider the nature of ecological information. Ecological information is given in the form of spatio-temporally extended patterns of stimulation. One such pattern is produced when we walk toward an object. If we keep the object at the center of our visual field while we approach it, we see that the object "expands." The rate at which the object expands (a variable known as "τ") specifies the time remaining until collision. Importantly, even though τ is currently present in the ongoing visual field, it provides information about an upcoming event, thus enabling the perceiving organism to control its behavior prospectively. It follows that anticipatory behavior – behavior with respect to some yet-to-come state of affairs – is possible by detecting current information*L*: "Weak anticipation is a matter of (sophisticated) guessing. Strong anticipation is a matter of lawful perceiving" (2018, p. 415). To finish up, Turvey offers some examples of strong anticipation in different tasks, including driving, catching balls, or even synchronization to day-night cycles by slime mold.

In conclusion, *Lectures on Perception* offers both an in-depth philosophical analysis on the theoretical foundations of ecological psychology and a complete recapitulation of the empirical evidence up to date. Both reasons together should be enough for us to realize how valuable this book is. Nevertheless, it has a serious flaw in it. Professing to be a canonical interpretation of the theory, the book offers Turvey's view exclusively, thus giving the reader a false impression that ecological psychology is far more monolithic than it is. If we consider that this book compiles materials elaborated with a pedagogical

aim, it is hard to understand why Turvey has refused to discuss the arguments against the idea that direct perception requires information*L* (see, e.g., Chemero, 2009; Withagen & Chemero, 2012), or why he has not considered the proposed alternatives for an ontology of affordances (see, e.g., Chemero, 2009; Stoffregen, 2003; Heras-Escribano, 2019). Engaging with these alternative proposals, even if only to refute them, would have enriched the book considerably, and it would have added pedagogical value to it. That said, I stand by the idea that *Lectures on Perception* is a "must" for anyone interested in ecological psychology.

Note

1. For Turvey, all classical dualisms, including mind–matter, subject–object, private–public, and perception–action, are manifestations of the overarching organism–environment dualism (2018, pp. 15, 316).

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