New Ideas in Psychology 45 (2017) 11–18

Contents lists available at ScienceDirect

New Ideas in Psychology

journal homepage: www.elsevier.com/locate/newideapsych

Inviting affordances and agency

Rob Withagen [a, *], Duarte Araújo [b], Harjo J. de Poel [a]

[a] Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen, The Netherlands
[b] CIPER, Faculdade de Motricidade Humana, Universidade de Lisboa, Portugal

ARTICLE INFO

Article history:
Received 2 September 2016
Accepted 15 December 2016

Keywords:
Affordances
Agency
Dynamical systems
Invitations
Phenomenology

ABSTRACT

Recently several authors have suggested that affordances are not mere possibilities for action but can also invite behavior. This reconceptualization of affordances asks for a reconsideration of the ecological approach to agency. After a portrayal of the role of agency in ecological psychology, we draw upon phenomenology to reveal what it means for an agent to be invited by affordances. We sketch a dynamical model of the animal-environment relationship that aims to do justice to this analysis. In the model, agency is conceptualized as the capacity to modulate the coupling strength with the environment—the agent can influence to what extent he or she is influenced by the different invitations. This account of agency keeps us far from the Cartesian idea that the agent imposes behavior. Indeed, by modulating the coupling strength, the agent simply alters the dynamics of the animal-environment interactions and thus the behavior that emerges.

1. Introduction

The concept of affordances was introduced by the ecological psychologist James Gibson (1979/1986) to refer to the action possibilities the environment offers the animal. For example, for human-beings the floor affords walking upon and a cup affords grasping. However, recently several authors have argued that affordances are not mere possibilities for action (as Gibson had stated) but can also have the potential to attract or repel an agent—they can solicit actions (e.g., Bruineberg & Rietveld, 2014; Heft, 2010; Dreyfus & Kelly, 2007; Käufer & Chemero, 2015; Rietveld, 2008; Withagen, de Poel, Araújo, & Pepping, 2012). Although the idea of inviting affordances is gaining momentum within the ecological approach, the implications of this conception for the notion of agency have not been worked out yet.

In the present paper we take up the challenge to develop an ecological account of agency that is based on the idea that affordances can invite behavior. We will begin with a brief overview of the place of agency in ecological approaches to animal behavior. Then, based on phenomenological accounts, it is argued that although agents are capable of acting in a world, they are generally drawn into it and follow its invitations. A dynamical model will be presented to capture this animal-environment relationship. This model can provide entry points for empirical studies on affordances as invitations. We end with the implications of this model for theories of agency and the emergence of behavior.

2. Agency and the ecological approach

For centuries the concept of agency did not have a central place in psychology. In fact, the idea that animals can be the source of their own activity was basically inconceivable from the framework that psychology had adopted. Ever since the mechanization of the worldview in the 17th and 18th century, philosophers and psychologists have followed physicists in conceiving of the environment as matter in motion. It is one big machine that obeys the laws of mechanics. And under the influence of Descartes' philosophy, non-human animals and later humans were considered to be machines as well—their behavior can be understood in mechanistic terms. Hence, following the machine metaphor, the idea that animals have agency became unthinkable in psychology. Animals appear as mere puppets that are pushed around by the environment.

Ecological psychologists have notoriously criticized the above mechanistic framework that, in one way or another, still dominates thinking in psychology and underlies the cognitive approach (see e.g., Gibson, 1979/1986; Heft, 2001; Reed, 1996; van Dijk & Withagen, 2014, 2016; Withagen & Michaels, 2005). Instead of

* Corresponding author. Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen, P.O. Box 196, 9700 AD Groningen, The Netherlands.
E-mail address: r.g.withagen@umcg.nl (R. Withagen).

http://dx.doi.org/10.1016/j.newideapsych.2016.12.002
0732-118X/

trying to artificially squeeze animal behavior into a predetermined framework, ecological psychologists have carefully scrutinized behavior and the environment in which it takes place.[1] In her article on the future of psychology, Eleanor Gibson (1994), for example, took aim at the mechanistic and reductionist approaches in psychology and argued that we should instead try to reveal the hallmarks of human behavior and explain them. Among these hallmarks she listed agency, which she equated with "the self in control" (Gibson, 1994, p. 71). And Reed (1996) even went so far as to claim that in their attempt to seek for causal explanations of behavior, psychologists have basically explained agency away. As the Gibsons, he placed the concept of agency central in his ecological approach, "[t]he goal of ecological psychology is to *explain* agency scientifically, not to explain it away or simply offer a discourse about it" (Reed, 1996, p. 19; emphasis in original).

Although ecological psychologists have generally emphasized the agency of animals, Reed is arguably the only ecological psychologist who developed a fully-fledged theory of it. His theory is largely based on the concept of affordances. In his view, animals regulate their behavior with respect to the action possibilities in their environment by using the ecological information that is available in the ambient arrays. Reed conceived of affordances as resources that do not cause the behavior of animals but make it possible. By doing so, he followed Gibson's traditional conception of affordances. Indeed, taking aim at the notion of demand character of the Gestalt psychologists, Gibson (1982) emphasized that affordances should be conceived of as *possibilities for action*:

> When a falling-off place (for example) is perceived, his locomotor behavior can be therewith controlled, but that does not imply that the mountain goat or the mountaineer automatically retreats from the cliff-edge. It affords walking-along as well as falling-off. There are paths, obstacles, slopes, barriers, and openings in the terrestrial layout, as well as brinks, and they all either afford or do not afford locomotion. (Gibson, 1982, p. 410).

By arguing that the environment is not a collection of *causes of* behavior but a manifold of *possibilities for* behavior, ecological psychologists made room for the idea that animals are the source of their activity. Indeed, it is now up to the animal which affordances will be actualized (see Cutting, 1982). To explain how animals "make their way in the world" (Reed, 1996, p. 19), Reed drew upon the selective retention theory that aims to explain phenomena in terms of variation and selection (see e.g., Withagen & van Wermeskerken, 2010). In Reed's (1993, 1996) view, perception-action cycles (i.e. the basic units of actions) compete and intentions emerge out of this competition.

We believe that although agents are by definition capable of "making their way in the world" and can be the source of their own activity, it might not be the primary mode they are in. This brings us to affordances as invitations.

3. Inviting affordances

Although affordances can invite behavior, not all affordances do so (e.g., Bruineberg & Rietveld, 2014; Käufer & Chemero, 2015; Rietveld & Kiverstein, 2014; Withagen et al., 2012). After all, a single object (e.g., chair) generally affords many different actions to an agent (e.g., sitting on, standing on, putting a book on), but the vast majority of these affordances do not invite behavior. To understand what it means for an agent to be invited by an affordance, phenomenology is crucial. Over the last decades, Hubert Dreyfus (1991, 2007, 2014) extensively explained the value of the phenomenological approaches of Merleau-Ponty and Heidegger for psychology and artificial intelligence. Among other things, he elucidated their idea that the environment solicits actions.

> To say that the world solicits a certain activity is to say that the agent *feels immediately drawn* to act a certain way. This is different from *deciding* to perform the activity, since in *feeling immediately drawn* to do something the subject experiences no act of the will. (Dreyfus & Kelly, 2007, p. 52; emphases in original)

In a similar vein, Rietveld and Kiverstein (2014) claimed that an inviting affordance is "manifest in a state of bodily 'action readiness'" (p. 342). Note how this description of the animal-environment relationship differs from the ecological approach that we laid out earlier. Instead of conceiving of the environment as a manifold of *possibilities for* action, the environment is now described as "*calling for* a certain way of acting" (Dreyfus & Kelly, 2007, p. 52; emphasis in original) with us bodily responding to these callings. That is, phenomenological accounts claim that we are not simply directed at the environment, the environment is also "directed at us, insofar as it solicits us" (Käufer & Chemero, 2015, p. 115).

It is important to emphasize that solicitations by affordances abound. Indeed, phenomenologists have stressed that bodily responding to the environment's invitations is the agents' primary mode. As Dreyfus and Kelly (2007) put it,

> We sense the world's solicitations and respond to their call all the time. In backing away from the 'close talker,' in stepping skillfully over the obstacle, in reaching 'automatically' for the proffered handshake, we find ourselves acting in definite ways without ever having decided to do so. In responding to the environment this way we feel ourselves giving in to its demands. (p. 52)

Recently, Rietveld and colleagues have depicted these solicitations with their concept of the "field of affordances" (e.g., de Haan, Rietveld, Stokhof, & Denys, 2013; Bruineberg & Rietveld, 2014; Rietveld & Kiverstein, 2014). They distinguished this field from the "landscape of affordance". The latter concept captures the scope of affordances that are merely available (perceived or not; inviting or not) in an environment of a certain agent. The field of affordances, on the other hand, captures how a collection of affordances invites an individual in a certain setting at a particular moment in time. Rietveld and colleagues illustrated this field in a graph in which the lateral axis depicts the affordances that invite, the depth axis represents a time axis (the "temporal horizon", see Rietveld & Kiverstein, 2014, p. 348), and the vertical axis depicts the degree of solicitation of the affordances (see Fig. 1). This portrayal of the field of affordances helps to understand the agent's relationship with and action in the environment. It emphasizes that at any moment in time there are generally multiple affordances soliciting, the solicitations differ in degree, and they vary over time (see also Withagen et al., 2012).

Although phenomenologists have emphasized that agents are generally drawn into the environment and respond to its solicitations, they have acknowledged that agents can intentionally decide to perform an action (Dreyfus & Kelly, 2007). Following the phenomenological tradition, Rietveld (2008), for example, distinguished reflective and unreflective action (see also Gallagher,

[1] It has been argued that this does not hold true for all the ecological approaches that take Gibson's work as its starting point (see Chemero, 2009; Withagen & Chemero, 2009).