

ECOLOGICAL PERCEPTUAL HOLISM – UNITY OF THE INDIVIDUAL AND THE ENVIRONMENT IN PERCEPTION

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ABSTRACT

In the second half of the 20th century, ecological theory of perception presented a new concept of perception according to which it is not a one-sided process within the perceiver, in the form of representation and interpretation of sensory data obtained from the environment, but a process within direct and continuous interaction between the percipient and the environment. Opposing the almost intuitive acceptance of numerous dualities based on the traditionally accepted separation of subject and object, ecological theory introduces an innovative concept of affordance. At about the same time, the initial ideas of an equally innovative theory of the organism-environment system arise, and in this paper they are connected in the context of the interpretation of perception. The goal of the paper is to present the concept of affordance and point out its affinity with the theory of the unity of organism and environment, as well as the need for further introduction of similar theoretical concepts, and with this intention, the concept of ecological perceptual holism is proposed.

Keywords: *perception, affordance, organism-environment system, ecological perceptual holism*

INTRODUCTION

The ecological approach to perception is formed as an opposition to the traditional interpretation of perception, which presupposes a fundamental separation of the observer (subject) and the object of observation (external world). The standard interpretation of the perceptual process emphasized the role of cognitive actions in the processing of sensory information as crucial for the final result of perception. Such interpretations of perception (as in the case of constructivist, cognitivist, and computational

theories) compare perception with cognitive processes or computer operations, indicating its essential complexity and rejecting the possibility of perception being direct.

The ecological theory supports the rarely represented interpretation of direct perception by not accepting such indirect actions in the interpretation of the perceptual process. The founder of the ecological theory of perception, James J. Gibson (1904 - 1979), insisted on the necessity of a real environment and ecological context, as well as on an active perceiver in the study of perception. As a result, he presented a

new conception of perception that had a major impact on the modern theory of perception. The gradual development of the theory is documented in three of Gibson's major works – *The Perception of the Visual World* (1950) [1], *The Senses Considered as Perceptual Systems* (1966) [2], and *The Ecological Approach to Visual Perception* (1979) [3]. In the context of the ecological approach, perception is interpreted as a momentary manifestation of the observer's direct awareness of the external world through his continuous interaction with the environment. It is primarily defined as the activity of exploring, detecting, and obtaining information from the environment.

This paper intends to point out the complementarity of the ecological theory with an equally new and innovative theory of the organism-environment system. Both theories attribute an essential holistic character to perception, and both find support in evolutionary explanation. Gibson pointed out that every perception is an evolutionary result because "active perceptual systems have so developed during evolution that they can resonate" [2] to directly available stimulus information in the environment. As a result of the exploratory activities of the organism through evolution, „perception evolved in the context of creatures making their way in the world" [4]. The behaviour has the central role of connecting and uniting the organism with the world around it, while perception is considered "more like a general orientation to the world" [5]. Assuming the adaptability of different species in directing their behaviour [6] and seeing the perception as part of the ecological process of an organism's life, the development of the organism-environment system and its inherent structure are also attributed to the evolutionary principle.

In philosophical and psychological terms, a significant contribution of the ecological theory of perception is the general abandonment of standard discourse based on dichotomies such as subjective-objective, internal-external, mental-physical or rational-empirical, based on Gibson's unique notion of

affordance, which unites the perceiver and the object of perception.

The objectives of this paper are: (1) to present the very concept of affordances as the intention of the ecological theory of perception to transcend traditional dualisms based on the separation of subject and object, and (2) by presenting the basic assumptions of the theory of the organism-environment system, to point out the framework of the organism-environment system as the only acceptable context for locating and researching affordances. Also, (3) the intention is to emphasize the need to introduce new concepts in order to completely overcome the established dualisms and transcend the conditionality of traditional philosophical-psychological discourse, and with this intention, the concept of *ecological perceptual holism* is proposed.

WHAT ARE AFFORDANCES?

In Gibson's last book, *The Ecological Approach to Visual Perception* (1979), in which he completes his ecological theory of perception, he also presents in detail his theory of affordances [3]. Primarily interpreted in the context of perception, Gibson's notion of affordances encompasses interaction, complementarity, and reciprocity of the individual and the environment in the perceptual process. It refers to both the environment i.e. to what objects in the environment are equipped with, and to the individual in terms of behaviour and actions that the environment allows him. Gibson believed that perceiving objects is perceiving their affordances: „what we perceive when we look at objects are their affordances, not their qualities" [3]. What we pay attention to and perceive directly is not the substance, surface, colour, or shape of the object, but the meaning that objects have for us - what they offer us and what behaviour they afford, how they can benefit or harm us. „The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill" [3], and all those possibilities can and

should be perceived in order to avoid or exploit them.

The environment offers terrain, shelters, food, water, objects, tools, and other living things, but the value and meaning of the observed object in environment are determined by the features of the observer and his or her organism. The affordance is relative to size, abilities and needs of the individual, which means, stone offers throwing - if it fits in the hand, a tree, cliff or building can afford climbing for those who are agile, water affords washing, drinking or swimming, and the terrain can afford walking, crawling or running.

The most intriguing aspect of affordances is that they are both objective and subjective. "An important fact about the affordances of the environment is that they are in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental. But, actually, an affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subjective-objective and helps us understand its inadequacy. It is equally a fact of the environment and a fact of behaviour. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer" [3].

Gibson's original description of affordances indicates a clear intention to transcend standard dualisms, but also raises many questions. From the perspective of direct realism, advocated by the ecological theory of perception, the question of the ontological status of affordance remains relevant. Among recent authors (Reed 1996 [4], Turvey 1992 [7], Michaels 2003 [8], Chemero 2003 [9], Stoffregen 2000 [10], 2003 [11], Sanders 1997 [12]) there is a generally accepted definition of affordances as dispositions between the properties of an organism (individual, animal) on the one hand and the properties of the environment on the other. There is an ongoing discussion on the specification of the properties of the environment in relation to the organism, as well as the specification of the

properties of the organism to which the properties of the environment refer. Despite certain disagreements in the precise specification of the properties on each side, there is a general agreement that affordances are properties of the environment in relation to the individual with consequences for behaviour, and that their existence is supported by the organism-environment system.

In this context, probably the most appropriate definition of affordances is given by Stoffregen, according to which they „are emergent properties of the animal-environment system" [11]. In the same sense but more vividly described by Heft, affordances derive from an individual's relationship to objects, to other living beings, and to places, due to their functional possibilities for an individual [13]. Or, as Chemero puts it, affordances arise along with the abilities of animals to perceive and take advantage of them, calling them "the glue that holds the animal and the environment together" [9].

The fact that the concept of the organism-environment system fully encompasses the notion of affordances indicates that a detailed and precise specification of dispositional elements of affordances, separately for the properties of the organism and for the properties of the environment, is not necessary. The organism and the environment are considered to be two complementary aspects of a unique living system - the organism-environment system.

THE UNITARY SYSTEM THEORY – THE ORGANISM-ENVIRONMENT SYSTEM

The idea of a strong connection and correspondence between the organism and the environment is consistent with the ecological approach to perception-action processes. The idea originated in the mid-20th century in the fields of epistemology (Dewey and Bentley 1949 [14]) and psychology (Angyal 1941 [15], Ashby 1960 [16]) as a reaction to the standard discourse based on the distinction of the

organism and the environment, and to the established morphological conception of the organism as a criterion of their separation. At the turn of the century, a series of papers on the theory of the organism-environment system was presented by Järvillehto (1998 [6], 1998 [17], 1999 [18], 2000 [19], 2009 [20]) based on "proposition that in any functional sense organisms and environment are inseparable and form only one unitary system" [6]. Other authors have examined different conceptualizations of the unitary system (Palmer 2004 [21]), interpreted the organism-environment reciprocities as fundamental to perception (Wagman and Miller 2003 [22], Heft 2007 [13]), and defined the affordances as the properties of the organism-environment system (Stoffregen 2003 [11]).

The theory of the organism-environment system can be summarized on three general assumptions:

The organism and the environment form a unique system that represents a unit of life.

The mutuality of the animal and the environment is based on the fact that the organism cannot exist without the environment, and the environment is not something external to the organism. An environment is ambient for a living object: „Each term implies the other. No animal could exist without an environment surrounding it. Equally, although not so obvious, an environment implies an animal (or at least an organism) to be surrounded" [3]. This theory assumes that both elements (the individual and the environment) are "ontologically identical" [22]. Their relationship described as a symbiosis, a living and dynamic process within a single, holistic system, excludes dualistic understanding and ontological separation, thus all dichotomies lose their meaning. The understanding of human action as a „process of the intertwining of the body and environment" [19] does not include the possibility of the existence of an autonomous inner world of the organism. It assumes that all the activities of the organism are extended to the environment and are the activities of the whole system, including brain activities and mental concepts such as consciousness,

memory, knowledge, emotions, perception, etc.

A distinction of organism and environment is possible only as complementary phases within a unique and dynamic life process.

The theory does not accept the interpretation that the skin of the organism represents the boundary and separates the organism from the environment, since this is a consequence of the problematic morphological conception of the organism - taking the skin as a morphological criterion for distinguishing organisms from the background and equating the background with the environment [21]. Instead, an organism is defined as "a system of integrated cells and tissues and *specified parts of the environment*, with which it forms a system" [6]. Analysis based on different approaches and perspectives (psychology, philosophy, biology, physiology, psychiatry, neurology) came to the same conclusion that the organism and the environment should be interpreted „as (secondary) distinctions made within (primary) unitary dynamical systems" [21], distinguishing them only as parts of one system of a higher level and between which there is no firm and clear boundary of separation, as illustrated by the processes of photosynthesis, respiration, ingestion of food, or the use of tool instead of organ (hand, finger).

All parts of the organism-environment system are active – the system is a dynamic life process that is constantly changing.

The system has a dynamic structure based on constant reorganization with the aim of its progressive development. „The structure of the organism-environment system can only be understood in terms of the result of behaviour. [...] Behaviour does not mean movement or interactions of two systems, but action of only one system, reorganization of this system, or change of the relations between its elements" [6]. The organism and the environment equally contribute to the continuous reorganization and development of the system. The environment is not only a passive surrounding of the organism but actively directs the activities of the organism towards useful results, which the organism must achieve to

continue its life process. Also, the behaviour of the organism, with its "external" activities (movements, actions) and "internal" ones (cognitive, psychological, and biological processes), contributes to the reorganization and development of the system.

Organisms, human and animal, alter and transform environments so as to better function in them, while the "environment bears the mark of their activities" [13]. A concrete indication of organism-environment reciprocity is the niche construction, a concept which refers to almost "any modification that the organism brings about in its environment" [23], such as creating places that afford shelter, constructing nests, creating tools, building of houses, growing food, as well as eliminating things that afford harm. In line with Gibson's use of the ecological concept of the *niche* as a set of affordances [3], the construction of a niche requires the perception and utilization of affordances, and it also consists in a change in affordance layout [23], that is, reorganizations of the system in which they exist.

ECOLOGICAL PERCEPTUAL HOLISM

Why there are still open questions about the ontology of affordances is best described by Edward S. Reed as follows: „The ontology of affordances (which I believe to be a special case of the evolutionary ontology of resources) is virtually unknown to philosophers, and the logic that might accommodate this ontology has not even begun to be developed" [5].

Conditionality to standard theories and concepts is the reason why we are not yet ready to understand the real grounding of the ontological theory of affordances and all the implications of such theory. In order to develop the new logic, it is necessary to overcome long accepted and deeply ingrained dualisms and to achieve complete mental detachment from such determinism.

For that reason, it is required to introduce and adopt new ideas and concepts in the discourse

[24]. With the same intention and based on the holistically oriented postulates of the ecological theory of perception and the theory of the unitary system, the term *ecological perceptual holism* is proposed in this paper. This term would include the following elements:

- the principle of reciprocity of organism and environment,
- basic postulates of the theory of the organism-environment system,
- principles of direct perception according to the ecological theory of perception.

The principle of reciprocity of the organism and the environment implies "different but mutually supportive realities" [14] and represents a central principle of ecological psychology and ecological theory of perception (Lombardo [25], Heft [13], Withagen and van Wermeskerken [23], Fultot, Turvey [26]), as well as in an evolutionary perspective on the ontology of affordances (Gibson [1], [3], Reed [4], [5], Chemero [9], Heft [13], Withagen and van Wermeskerken [23]). This ecological principle of reciprocity encompasses the dispositional interconnection of the properties of the organism and the properties of the environment according to the actual definition of affordances. As already mentioned, affordances are defined as „emergent properties of the animal-environment system" [...] which also means the [...] "opportunity for action" [11].

Based on Gibson's notion of direct perception which „entails that a description of the environment - the places in which the animal moves around and acts - is an integral part of a psychological explanation of perception" [27], holism (in the title of the proposed concept) refers to continuous interaction between the observer and the environment in the perceptual process. From the perspective of ecological theory, perception is a manifestation of direct awareness of the world and reality around us, which is not based on cognitive functions of data processing, but the connection between perception and action. According to this connection „perception and behaviour consist of the fundamental

relationships at the macro scale, not of fundamental *pieces* at the *microscale*" [22], meaning the ecological level of the organism-environment system. Perception is then considered as a cyclical process that encompasses the entire organism-environment system, equally involving the organism (its receptors, sensory and motor organs) and the environmental events [18]. As Heft pointed out, „ecological psychologists need to embrace an expanded sense of animal-environment reciprocity. It is a *maxim* of ecological psychology that the activities of perceivers are an integral facet of perceiving; that dynamic perception-action processes more adequately characterize perception than standard input models that treat perception as a one-sided affair" [13].

Referring to the principle of reciprocity and the principles of direct perception, the ambition of the concept of ecological perceptual holism is to encompass unity, complementarity, and natural reciprocity between opposing elements in the process of perception and support the perspective of perceptual realism advocated by ecological theory. The intention is also to semantically unite the polarities (organism-environment, individual-world, subject-object, the mind of the observer-object being observed) immanent to the organism-environment system and affordances, in order to avoid standard morphological distinctions.

CONCLUSION

The idea of a reciprocity and correspondence between the organism and the environment prevails in the ecological approach to perception and action, in the evolutionary perspective on the ontology of affordances, and it is central to the theory of affordances and the theory of the organism-environment system. Both theories, the theory of affordances and the theory of the organism-environment system, are based on the idea of an abstract principle according to which the world (and reality) manifests itself through dynamism and constant change, which is

actualized by the organism's behaviour enabled by perception.

Considering the fact that the concept of the organism-environment system completely encompasses the notion of affordances, it was pointed out that the research of the ontology of affordances and their fundamentally dual character should be considered only in the context of the theory of the organism-environment system. According to the theory, it is not necessary to differentiate and specify ontological foundations of each component of the system (the organism and the environment) separately, since they are considered to be two complementary and ontologically identical aspects of one whole.

If a new logic of thought is to be developed to understand the ontology of affordances, new ideas should also be presented, and the notion of ecological perceptual holism is proposed for this purpose. Based on the principle of ecological reciprocity of organism and environment, the ambition of the proposed concept is to include unity, indivisibility, complementarity, and natural mutuality between opposing elements in the process of perception. Including the principle of direct awareness of the organism on its environment, the concept of ecological perceptual holism emphasises the immediacy of the perceptual process and supports the position of perceptual realism of ecological theory.

Since the term primary signifies the unity of the polarities that are immanent to the organism-environment system and affordances, the tendency is to semantically unite both poles of duality in perception, in order to avoid opposing notions (subject-object, organism-environment, observer-observed) and consequent associations of traditionally accepted dualisms.

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