

MIT Press • Open Encyclopedia of Cognitive Science

Affordances

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MIT Press

Published on: Jul 24, 2024

URL: <https://oecs.mit.edu/pub/984ungzu>

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The concept of affordances was introduced by psychologist James J. Gibson as the primary entities that animals, including non-human animals, perceive. For example, rather than perceiving a solid, well-supported surface with an area of approximately 750 cm, approximately 45 cm off the floor, or even a bench, a human typically perceives the affordance for sitting. Similarly, rather than perceiving a glob of honey, an ant perceives affordances for eating. The idea is that perceiving affordances would enable animals to act without first engaging in a complex series of inferential processes. The concept *affordance* has been central to the ecological approach in the cognitive sciences and has also played key roles in human-machine interaction, anthropology, the philosophy of mind, the philosophy of science, and across the perceptual and cognitive sciences more broadly. The notion has also been controversial, with ongoing disagreements over how to define the concept affordance, whether affordances are directly or inferentially perceived, and whether there are social affordances or affordances for joint action.

History

The term affordance was introduced in psychology as a name for environmental opportunities for behavior by [Gibson \(1979\)](#). The root of the idea is from Gestalt psychology, particularly the idea of valence or demand character—a felt pull to action—inherent in experience. Affordances, unlike valences or demand characters, are not mental; they are features of the environment that do not change given the needs of a perceiver. An apple, for example, still affords eating, even when a perceiver is not hungry. Nonetheless, an apple’s affordance for eating is still in some sense dependent on perceivers. The apple affords eating for most humans but does not afford eating for cats.

Gibson’s writing on affordances was sometimes imprecise and it was not clear in his 1979 book what, specifically, he intended the relationship between affordances and perceivers of affordances to be. Sometimes Gibson seemed to say that affordances are properties of objects in the environment; sometimes he seemed to say that affordances are relations between perceivers and objects in the environment. However, it was always clear that for Gibson, affordances are not mental entities; they are directly perceived entities in the environment.

[Turvey et al. \(1981\)](#) systematized and formalized the ideas in Gibson’s work. Affordances, in their view, are directly perceivable dispositional properties of objects that are paired with dispositional properties of animals to which they gave the neologism *effectivities*. Dispositional properties are properties that are not currently manifest but would become manifest in the right conditions. For example, the dispositional property “fragile” names the tendency of currently intact panes of glass to break when struck sharply. On this understanding of affordances, the affordance “climbable” pairs with the effectivity “ability to climb” to yield climbing behavior. This view of affordances as dispositional properties of objects in the environment has been the standard view since 1981 and is the foundation for most experimental work on affordances.

The first published experimental work specifically on affordances is by [Warren \(1984\)](#). Warren asked participants to judge whether they could climb stairs of systematically varying heights and found that participants correctly perceived affordances for climbing and that they did so as a function of the lengths of their legs. Since this early work, there have been thousands of empirical studies of affordances and their perception, especially in the context of bodily movement. In addition to exploring the details of specific affordances for activities, it has been shown that participants quickly adapt their affordance perception to changes in their abilities to act ([Mark, 1987](#)) and that even young children can correctly perceive affordances for other people ([Rochat, 1995](#)).

Affordances continue to be a central topic in design and human-machine interaction. However, [Norman \(1988\)](#)'s understanding of affordances was quite different from that of Gibson and the ecological cognitive scientists who followed him in that, for Norman, affordances are not directly perceived but are a kind of mental representation. For Norman, that is, affordances are more like the Gestalt demand characters. This has led to a longstanding disagreement between adherents of the ecological approach, who think that affordances are directly perceivable ([Turvey et al., 1981](#)), and more mainstream cognitive scientists who wish to employ the concept in a representationalist context ([Vera & Simon, 1993](#)).

Core concepts

Action, information, and direct perception

Part of the motivation for the creation of the concept of affordances was the contention that perception of affordances is direct, which is to say that it is not the result of mental computation, as most cognitive scientists assume. The explanatory power of affordances is that they enable us to explain action without requiring complex mental processes. For example, if an ant perceives the affordance “edible,” it can guide its actions without first identifying the glob as honey, remembering that honey contains sugar and it can eat sugars and then inferring that it can eat the honey. If the ant perceives “edibility” directly, these mental activities are unnecessary.

Claiming that affordances are directly perceived, however, depends on the assumption that there is sufficient information available in the environment for perceiving affordances without further computations. To show that there is sufficient information about affordances, ecological cognitive scientists point to the tight connection between perception and action. From the point of view of ecological cognitive scientists, perception and action are tightly connected and, in many cases, action—for example, moving the eyes, turning the head, moving closer to something—is part of the process of perception. This action generates information for perception, enabling the direct perception of affordances.

Affordances and invitations

Affordances are features of the environment that enable actions for a perceiver. For an individual perceiver, there are thousands of affordances in a typical situation, but most go unnoticed and, of those that are noticed, very few are acted upon. The device you are reading this on affords throwing across the room, the chair you are sitting on affords crawling under, and so on. But affordances like these are not noticed typically.

One solution to this challenge is to distinguish between affordances and invitations. To do so, ecological cognitive scientists draw on ecological theories of action ([Reed, 1996](#)) and phenomenological philosophy ([Withagen et al., 2012](#)). Invitations are the small subset of currently relevant actions that an environment affords an agent that the agent notices as possible actions.

Questions, controversies, and new developments

Dispositions versus relations

As noted above, most adherents of the ecological approach assume that affordances are not mental representation but features of the environment. There is a controversy among ecological psychologists, however, concerning whether affordances are dispositional features of objects in the environment ([Turvey et al., 1981](#); [Turvey, 1992](#); [Heras-Escribano, 2019](#)) or whether affordances are relations between animals and features of the environment ([Stoffregen, 2003](#); [Chemero, 2003](#)). One could think that affordances are dispositions that are inferred via a traditional computational story, rather than directly perceived. Hence, the issue turns primarily on whether one is more interested in putting affordances in a rigorous scientific context, as proponents of the dispositional approach do, or more interested in reflecting Gibson's original intentions on defining the concept.

Social affordances and affordances for joint action

In his earliest writing about affordances, Gibson discussed the affordances offered by conspecifics for social interaction. Since then, there has been significant interest in *social affordances* ([Valenti & Gold, 1991](#)), including controversy about how to understand the affordances offered by other people ([Brancazio, 2020](#); [Baggs, 2021](#)). Among the social affordances are opportunities for joint action ([Marsh et al., 2009](#)), which is to say affordances that are available to pairs or groups of people that are not available to individuals, such as carrying a sofa. Joint affordances have been very influential in research on joint action ([Davis et al., 2010](#)).

Broader connections

Affordances, design, and disability

As noted above, the concept of affordances has been important in design and human-machine interaction since its introduction. This importance continues to the present day ([Davis, 2021](#); [Baber, 2022](#)). Another, newer line

of research uses the relationship between affordances and design to explain the experiences of people with disabilities, who regularly must make their own affordances ([Dokumaci, 2023](#)).

Affordances and the enactive approach

The enactive approach in cognitive science, established in the 1990s, proposes to understand cognition in terms of the self-maintaining activities of all living things ([Varela et al., 1991](#)). Although the early work on the enactive approach in cognitive science understood itself to be in opposition to the ecological approach, the concept of affordances has since become very important in theoretical development of the approach ([Gallagher, 2017](#)). This use of affordances by enactive theorists has enabled a rapprochement between the enactive and ecological approaches in cognitive science ([Chemero, 2009](#)) and hope for a joint ecological-enactive approach to embodied cognition ([McGann, 2014](#); [Rietveld & Kiverstein, 2014](#); [McGann et al., 2020](#)).

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