

Reference: Rietveld, E. & Kiverstein, J. (forthcoming) A rich landscape of affordances. Ecological Psychology.

A Rich Landscape of Affordances

Authors:

Dr. Erik Rietveld (corresponding author)

University of Amsterdam

Department of Philosophy/ILLC/AMC

Oude Turfmarkt 141

1012 GC Amsterdam

The Netherlands

E-mail: d.w.rietveld@amc.uva.nl

Dr. Julian Kiverstein

Department of Philosophy/ILLC

Oude Turfmarkt 141

1012 GC Amsterdam

The Netherlands

E-mail: j.d.kiverstein@uva.nl

Send reprint requests to: Erik Rietveld

Running head: A Rich Landscape of Affordances

A Rich Landscape of Affordances

Abstract

How broad is the class of affordances we can perceive? Affordances (Gibson, 1979) are possibilities for action provided to an animal by the environment – by the substances, surfaces, objects, and other living creatures that surround it. A widespread assumption has been that affordances primarily relate to motor action – to locomotion and manual behaviours such as reaching and grasping. We propose an account of affordances according to which the concept of affordances has a much broader application than has hitherto been supposed. We will argue that the affordances an environment offers to an animal are dependent on the skills the animal possesses. By virtue of our many abilities, the landscape of affordances we inhabit as humans is very rich and resourceful.

A Rich Landscape of Affordances

Introduction

We will propose an account of affordances according to which the concept of affordances has a much broader application than has hitherto been supposed. Up till now affordances have typically been understood as motor possibilities the environment offers to a creature such as reaching, grasping, sitting, walking *etc.* Our main goal in this paper will be to develop a new conceptual framework for understanding what affordances are. What our view of affordances opens up is that an animal's engagement with an affordance always involves the exercise of an ability in a specific context. We will argue that the affordances the environment offers are dependent on the abilities available in a particular ecological niche. Previous philosophical work on affordances has tended to neglect the relation between the affordances and the adequate exercise of abilities in a context. We believe that this is particularly problematic in the human case, for we are creatures that participate in socio-cultural practices. The human ecological niche is shaped and sculpted by the rich variety of social practices humans engage in. In what follows we will develop an account of affordances for humans that foregrounds their embedding in socio-cultural practices. Recognizing this point reveals that the affordances the environment offers are a good deal more extensive than has standardly been recognized (some important exceptions in ecological psychology are Heft, 2001; Costal, 1999). Moreover, armed with this enriched philosophical conceptualization of affordances, one is better able to perceive the *resourcefulness* of our environment, including our built environment.

Exercising an ability can be better or worse, adequate or inadequate, correct or incorrect in the context of a particular situation, hence there is a *normative* dimension to the abilities for picking up affordances that has also not been sufficiently recognized in the literature on affordances. Normativity is commonly taken to be a feature of complex human linguistic practices of giving and asking for reasons, but we will argue that a very basic kind of normativity belongs to the engagement with affordances in particular situations more generally. In this paper we restrict our discussion to human behaviour while in no way wishing to downplay the important classes of behaviours found both in human and non-human animal ecologies. We will be concerned with distinctively human forms of skills and expertise such as those employed in the design of buildings, which are traditionally seen as examples of distinctively human, ‘higher-level’ cognition. We find this commonly made distinction between ‘lower’ and ‘higher’ forms of cognition unhelpful. We will suggest instead that this distinction is better marked by differences in *level of ability* or expertise in doing things with the affordances of the environment.

Once we appreciate the dependence of affordances on abilities it becomes clear how the concept might be central to explaining what Gibson referred to as “the whole spectrum of social significance” for humans (Gibson, 1979, pp. 127-128). We believe this reveals new possibilities for tackling the problems that ‘higher’ cognition has presented to the field of embodied cognitive science. We propose thinking of ‘higher’ cognitive capacities in terms of skillful activities in socio-cultural practices, and the material resources exploited in those practices. Skilled ‘higher’ cognition can be understood in terms of selective engagement – in concrete situations – with the rich landscape of affordances.

Our conceptual framework will include some useful distinctions between affordances and relevant affordances or “solicitations”, and between the affordances available in the

human ecological niche and in non-human niches. It will also help to dissolve a theoretical tension between those who think that affordances are available resources (e.g. Reed, 1996; Silva et al., 2013) and those who think they are relational (e.g. Chemero, 2003, 2009) by showing how an affordance can be understood as being *both* relational and a resource.

Finally, having a better conceptual understanding of the relational nature of affordances will prove important for creative professions because it suggests new ways of increasing our openness to these available resources. By acquiring abilities that flourish in different socio-cultural practices than one's own, one can come to see new possibilities for action provided by the material environment. Our environment is much richer than we commonly think it is.

1. The Embedding of Affordances in Forms of Life

Gibson's notion of affordances is complex and much debated, but there is nevertheless widespread agreement that affordances are to be understood as possibilities for *action* provided to an animal by the environment – by the substances, surfaces, objects, and other living creatures that surround the animal (Reed, 1996; Heft, 2001, Michaels, 2003; Chemero, 2003, 2009). Gibson introduced the notion of affordances as follows:

“The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or for ill” (Gibson, 1979, p. 127).

A leaf, for instance, can afford pulling to a worm (Reed, 1996; Darwin, 1881), blowing to a person who knows how to handle a leaf-blower, and collecting to a child. Generalizing

somewhat we can say that surfaces afford, for instance, locomotion and support, substances nutrition and manufacture, objects manipulation, other animals a variety of interactions, and other people afford “the whole spectrum of social significance” (Gibson, 1979, pp. 127-128).

The convenient and useful definition of affordances as possibilities for action obscures the complexity and richness of the concept we find at work in Gibson’s writings (see e.g. Gibson 1979). We run the risk of missing in particular how the affordances an environment offers are relative to an animal’s way of life and the normativity implied in the notion of affordances in our human case (see section 2).

Gibson introduced the idea that each species of animal has its own distinctive way of life in offering a definition of the concept of a niche. An ecological niche is built and transformed by members of the species through the species’ typical ways of acting. All animals actively modify their niches, tailoring the places they inhabit to fit with their needs. Laland *et al.* (2000, p. 131) give as examples the construction of “nests, holes, burrows, paths, webs, dams, and chemical environment”. Note, again, the materiality of the environment that offers affordances. In each of these examples, the organism is altering the material environment so that it offers possibilities for action that may improve the animal’s situation.

Gibson makes the connection between an animal’s niche and its way of life in the following passage:

“Ecologists have the concept of a *niche*. A species of animal is said to utilize or occupy a certain niche in the environment. This is not quite the same as

the *habitat* of the species; a niche refers more to *how* an animal lives than to *where* it lives. I suggest that a niche is a set of affordances.

The natural environment offers many ways of life, and different animals have different ways of life. The niche implies a *kind of animal*, and the animal implies a kind of niche. Note the complementarity of the two.” (Gibson, 1979, p. 128, last italic is ours).

We take seriously Gibson’s ideas that one and the same material environment can offer “many ways of life” and that each type or species of animal enacts a unique way of life. We will take Gibson’s idea of an animal’s “way of life” to be the proper starting point for a theory of affordances. He makes it clear that the affordances the environment offers to a particular kind of animal depend on this animal’s way of life. However, in the human case the concept of a way of life is ambiguous. It can mean the human way of life in general but also the different practices to be found in different cultures. We think that the concept of affordances as applied to humans should be able to straddle differences within the human way of life and accommodate the rich variety of socio-cultural practices that are found in the human ecological niche. In the case of humans we also need to be able to deal with normativity at the level of socio cultural practices. Gibson’s concept of a way of life helps us to make sense of the variety of affordances that show up for different species because of differences in how they live. However to understand the variety of practices within the human way of life we find it helpful to introduce a different concept. We borrow the notion of *form of life* from the writings of Wittgenstein to help us deal with this conceptual challenge.

The form of life of a kind of animal consists of patterns in its behaviour, (relatively) stable and regular ways of doing things. In the case of humans, these regular patterns are manifest in the normative behaviours and customs of our communities. What is common to human beings is not just the biology we share, but also our being embedded in socio-cultural practices: our sharing steady ways of living with others, our, relatively stable ways of going on (cf. Wittgenstein's "*feste Lebensformen*", 1993, C&E, paragraph 420, p. 397). Of course, there is also a good deal of variety in the practices humans partake in, so there is likewise variety in our forms of life. Compare for instance the practices of those who participate in the academic world with those of craftsmen. Both have many common ways of doing things but there are also many significant differences.

Tim Ingold (2011/2000) has argued that the central difference between these forms of life can be attributed to the embodied skills of practitioners situated in their structured surroundings:

“[M]uch if not all of what we are accustomed to call cultural variation in fact consists of variations of skills. By skills I do not mean techniques of the body, but the capabilities of action and perception of the whole organic being (indissolubly mind and body) situated in a richly structured environment.”

(Ingold 2011/2000, p. 5)

A nice historical record and visualization of “steady ways of going on” to be found in a form of life can be seen in the 1980 documentary “The social life of small urban spaces” by William Whyte, in which he uses a time lapse camera to film and analyse when and where people sit and do not sit on public squares in New-York. In one episode (starting at 19:20min) we see the hurly-burly of activity in this public space, Paley Park, from

different perspectives, both from above, but also from the eye-level perspective of person moving through the space where people are seated. What we wish to highlight from this scene is the way in which Whyte distinguishes different grains of analysis in the same patterns of behaviour. In describing how people are seated, he makes the following interesting observation:

“Notice [...] the tendency of men to take the front row and women to take the rear. Now as the day goes on the patterns remain quite consistent. And so they do day after day. But this Olympian perspective can be rather misleading. What we see looking down is regularity. Now this is a truth, but it is only a partial truth. Get down to eye-level, the way people see the place and you don't see regularity. Instead you see a sort of amiable miscellany. People are placed this way and that...Choices are always opening up.”

Both these perspectives reveal different but complementary aspects of people's behaviour in this place. From above (e.g. with a time-lapse camera) we see the general pattern of behaviour or socio-cultural practice in this place, but when we zoom in we find a great variety of ways in which people engage with the various action possibilities the park offers.

The flexibility that the notion of a 'form of life' offers, allows us to capture the variety of practices within the human way of life. It can be understood on at least three grains of analysis: the human form of life in general (as contrasted with other kinds of animals), a particular socio-cultural practice (i.e. regularities in the sitting behaviour of New Yorkers) and finally, the particular engagement with affordances of individuals that we see when we zoom in on this practice at a more detailed level of analysis. It is this straddling of

different grains of analysis that makes the notion of ‘form of life’ well suited for using it in a definition of affordances. It is not only humans that have a form of life, but also non-human animals. Wittgenstein does not restrict the application of this concept to socio-cultural practices; he talks of the lion form of life for instance (Wittgenstein, 1953, PI, p. 223). The notion of a form of life applies equally well to cats, earthworms, weaverbirds and humans (Hanfling, 2002). Rather than talk of kinds of animals or species as Gibson does, we will use the notion of a *‘form of life’*. The human form of life however comprises a multiplicity of socio-cultural practices, think of the practices of builders and architects described by Wittgenstein (1953, 1978).

The first improvement we suggest to the standard definition of affordances is thus to situate affordances in the context of a form of life. Affordances are possibilities for action the environment offers to a form of life, and an ecological niche is a network of interrelated affordances available in a particular form of life on the basis of the abilities manifested in its practices; its stable ways of doing things. An individual affordance is an aspect of such a niche. In the next section we will see that situating affordances in the context of a form of life also allows us to deal with normativity at the level of socio cultural practices in the human form of life.

2. The normativity of affordances

Chemero (2003) has usefully suggested we think of individual affordances as *relations* between “features” of the environment and the abilities of organisms. We believe that there is much that is right about his account, but we would like to develop certain dimensions that he leaves implicit. The discussion in our previous section suggests that tying affordances to the “abilities of organisms” fails to do justice to the different grains

of analysis on which organisms' activities can be described. We believe it is more precise to understand abilities in the context of a form of life. In the human case, this form of life is socio-cultural hence the abilities that are acquired by participating in skilled practices are abilities to act adequately according to the norms of the practice. Moreover, once we see that the spectrum of abilities available in a form of life include skilled activities and expertise it becomes apparent that the landscape of affordances is much richer in terms of the affordances it offers than might have been apparent on Chemero's account. The range of human behaviour that we can understand in terms of engagement with affordances becomes correspondingly wider. Finally, the notion of a form of life has the additional advantage of foregrounding the normative aspect of human engagements with affordances, which will be theme of our discussion in this section.

As will be clear by now we believe that both humans and non-human animals have abilities that count as skills. Thus, to better understand what skills are and how they are acquired we should look at various kinds of animals. Ingold (2011/2000) has developed an excellent account of skill and skill acquisition that applies equally to both humans and non-human animals:

“The abilities of the weaverbird, just like those of the human maker of string bags, are developed through an active exploration of the possibilities afforded by the environment, in the choice of materials and structural supports, and of bodily capacities of movement, posture, and prehension. Furthermore, the key to successful nest building lies not so much in the movements themselves as in the bird's ability to adjust its movements with exquisite precision in relation to the evolving form of its construction.” (Ingold, 2011, p. 358).

Both the weaverbird and the human fluently coordinate their movements with the material aspects of available affordances. In acquiring a skill we learn in which places in the environment to find the affordances relevant to our concerns and what aspects of environment to attend to. The acquisition of a skill by a novice involves what Gibson has called an “education of attention” (Gibson, 1979, p. 254, cited by Ingold, 2011/2000, p. 354). The process of educating attention crucially involves other practitioners who selectively introduce the novice to the right aspects of the environment and their affordances.

This emphasis on sociomaterial scaffolding in skill acquisition is in line with empirical work by Patricia Zukow-Goldring (2012, pp. 571-573) who emphasises the importance of ‘assisted imitation’ and organism-environment coupling in language development. Caregivers help infants to “learn what to notice and do” (Zukow-Goldring , 2012, pp. 571). They “assist infants to detect the dynamic coupling of affordances and bodily abilities”. [...They] elicit/promote action by directing infants to notice specific elements, relations, or events over the myriad other possibilities available.” (Zukow-Goldring , 2012, p. 573).

So in the process of education of attention the novice is brought to a selected aspect of the world that is of significance to the given practice and shown landmarks that orient his activities. In this way the novice learns what possibilities for action an aspect of the environment provides. Consider Ingold’s description of hunter practices:

“The novice hunter learns by accompanying more experienced hands in the woods. As he goes about, he is instructed what to look out for, and his attention is drawn to subtle clues that he might otherwise fail to notice: in other words, he

is led to develop a sophisticated perceptual awareness of properties of his surroundings and of the possibilities they afford for action. For example, he learns to register those qualities of surface texture that enable one to tell, merely from touch, how long ago an animal left its imprint in the snow, and how fast it was travelling. [...T]he instructions the novice hunter receives – to watch out for this, attend to that, and so on – only take on meaning in the context of his engagement with the environment.” (Ingold, p. 2011, p. 36).

As the novice engages with particular aspects of the environment, so her performance is subject to *normative* assessment as better or worse, as more or less correct given the specific demands of the situation. Think of a child learning to name colours: much of the child’s learning happens unobtrusively and in an unnoticed way through the imitation of others. In this kind of situation the child learns to care about the right thing; i.e. acquires the concerns of her community. Social feedback plays a central role: when the child uses a colour term correctly they receive praise, when they use a term contrary to its normal usage they are corrected. As the child becomes increasingly skilled in the colour-naming game, so they acquire a feel for which uses are acceptable and which are not. As they become increasingly fluent in the art of naming the colour of things, so they reach a point where they can simply perceive immediately which colour term to apply in a given context.

The notion of normativity that we take to be applicable to a skilled individual’s engagement with affordances comes from the individual’s ability to distinguish correct from incorrect, better from worse, optimal from suboptimal, or adequate from inadequate activities in a specific, concrete material setting. We call this type of normativity *situated normativity* (Rietveld 2008) because it is the concrete situation, broadly

understood, that makes an individual's activity adequate or not. The adequacy of some activity does depend in part on agreement with what the members of a socio-cultural practice do. However the patterns of behaviour that are found within a practice in turn derive from the continuous adjustment and adaptation of behaviour to the affordances of things as they are found in concrete *material settings*.

Acting adequately requires not only being in “correspondence” (Ingold, 2013, p. 7) or being coordinated with other participants in the practice but *also* on the actions being well attuned to material things. When I mistime my step in climbing a steep set of stairs in an Amsterdam apartment, my stepping behaviour is inadequate because my grip on these *particular* stairs is not optimal. The steep stairs found in Amsterdam buildings may be unfamiliar to, perhaps because I've recently relocated to the Netherlands. Thus my habitual performance is not adequately tuned to these specific stairs and the way in which they afford climbing. It is this lack of an adequate grip on the particular materiality of the stairs that makes my stepping behaviour incorrect.

More generally, we can say that skilled agents that are familiar with the sociomaterial surroundings and able to “collaborate” (Ingold, 2013, p. 128) with it; they have acquired their abilities through learning how to deal with these very specific material settings in which their training has taken place. The outcomes of this learning process are abilities rooted in and interwoven with these material settings (Noë, 2009, p. 51) and embedded in a particular form of life.

One might now wonder what determines the correctness of the skilled practitioner's or expert's way of doing things. Wittgenstein has an account of normativity that locates the normativity at the level of the practice in which the individual's performance is embedded. In other words, he locates normativity at the level of the form of life

describable at different grains of analysis, in the way we have seen above in the example of Whyte's observation of sitting behaviour in the Paley Park of the 1970s. Following Wittgenstein, the philosopher John McDowell sees rightly that even unreflective human actions are situated within communal practice (McDowell 1998a/b/c/d; Rietveld 2008):.

“How can a performance both be nothing but a ‘blind’ reaction to a situation, not an attempt to act on an interpretation [...]; and be a case of going by a rule [...]? The answer is: by belonging to a custom (PI 198), practice (PI 202), or institution (RFM VI-31).” (McDowell, 1998c, p. 242).

When humans act skilfully in responding to affordances, their actions are subject to normative assessment because they involve something along the lines of Wittgenstein's ‘blind rule following’ (McDowell, 1998c; Stein, 1997; Rietveld 2008). What matters for understanding the normativity of (even ‘blind’) rule-following according to Wittgenstein, is not that one can describe the rule one is following or reflect on its conditions of application (Wittgenstein 1953, 1956). Indeed experts feel immediately compelled to act based on the skills they have acquired as participants in a practice or custom. We suggest that what matters for successful coordination with the activities of others is that one can *reliably act in ways that fit in with a socio-cultural practice* or communal custom, but also with the *specific details* of the particular situation in which the activity is taking place. Agreement on how one should act in a given particular situation is shared with the other participants in the practice (Stein, 1997, p. 211; Wittgenstein, 1953, PI 241; Wittgenstein 1956, henceforth RFM, VII-40). When the skilled individual goes wrong, his action will be seen as deviating from what skilled agents sharing his form of life should do. What matters is not an agreement in opinions but an agreement in a form of life; in the way of doing things (of using language for instance); of working together and of coordinating

interactions with other people and with material aspects of the environment (cf. Ingold, 2011/2000, p. 163). To quote Wittgenstein:

" 'So you are saying that human agreement decides what is true and what is false?' -- It is what human beings *say* that is true and false; and they agree in the *language* they *use*. That is not agreement in opinions but in form of life."
(Wittgenstein, 1953, PI 241, last italics is ours).

The individual's activity may be unreflective but it is nevertheless not non-normative due to the complex context of the practice in which it takes place (Rietveld 2008). Cavell (1969, p. 52) writes on learning and teaching: "We say a word and the child repeats it. What is repeating here? All we know is that the child makes a sound which we accept." When the skilled individual goes wrong, he immediately senses the deviation from what the situation demands or what skilled agents in his practice accept.

How do these insights concerning situated normativity and the notion of the form of life lead to a refinement of our understanding of affordances? We began this section with the definition proposed by Chemero (2003; cf. 2009) according to which affordances are relations between features of the environment and abilities of organisms. Chemero rightly insists on a contrast between (inherently normative) abilities and brute behavioural dispositions. "Dispositions" he tells us "never fail; they simply are or are not in the appropriate circumstances to become manifest." (Chemero, 2009, p. 145). And he writes:

"[E]ven on a firm surface, with no wind, while perfectly healthy and sober, I may fail in my attempt to climb a step that affords climbing for me. This is

inconceivable in the case of dispositions, which necessarily become manifest whenever their actualizing circumstances are present” (Chemero, 2003, p. 190).

We would like to add that when an individual engages adequately with an affordance this is often an exercise of *skill*. In acquiring a skill the individual becomes increasingly expert at responding adequately and appropriately to the actions a particular situation invites. He becomes progressively able to perform both skilfully and unreflectively without giving the matter of how he should act any thought. Performing adequately becomes second nature. Moreover his sense of how and when he should act becomes increasingly refined. He acquires a finer and finer capacity for discriminating between situations and for discerning the different types of action appropriate to the details of these situations.

Our analysis of the concept of affordances has the notion of ability at its core – here we are in agreement with Chemero. However, Chemero misses the way in which these abilities, in case of humans, are generally abilities the individual has by knowing how to take part in a socio-cultural practice. The normative standards in terms of which an agent’s engagement with affordances are assessed as better or worse come from practices or customs belonging to a form of life. This suggests the following alternative definition to that proposed by Chemero: *Affordances are relations between aspects of a material environment and abilities available in a form of life*. Note that in the human case the material environment has been sculpted by our socio-cultural practices into a socio-material environment. We therefore prefer to talk about affordances as “aspects” of the environment instead of using Chemero’s term “features”. In the process of education of attention the novice learns to selectively pick up some aspects of the environment while ignoring others.

3. *The reality of affordances*

An objection could be raised that by understanding affordances as relations between aspects of the material environment and abilities available in a form of life we compromise the objective reality of affordances. The variety of abilities within a form of life means that what shows up as an affordance for one skilled agent may not do so for another agent belonging to the same form of life, but lacking the relevant ability. This seems to imply that affordances have an existence that is dependent on the individual's abilities. Costall (1999) raises a related worry when he points that the affordances of the human environment are often products of sociocultural activities (Heft 2001, p. 134). How can an affordance in the human form of life be a product of sociocultural activities while also existing independently of individuals? These problems threaten to undermine the realism Gibson subscribed to with respect to affordances (Gibson, 1979; see also Heft, 2001; Chemero, 2003; cf. 2009). Our aim in this section will therefore be to defend a realism about affordances that is based on both the material environment and the abilities available in the form of life.

Let us begin by distinguishing the following two levels of description:

- (1) The form of life and the patterns of behaviour that make it up (a form of life in which individuals have the *potential* to engage with affordances skillfully);
- (2) A particular individual's actual skilled engagement with an affordance.

We will argue that the existence of affordances is not dependent on the actual engagement with an affordance by any *particular* individual, but affordances nevertheless have an existence that is relative to a form of life. Reed puts this point as follows:

“An ecological niche is something that is available to a *population* of

organisms, even if it is not completely used by any one member of that population. Most leaves afford plugging burrows whether or not some *particular* worm uses them.” (Reed, 1996, p. 26, second emphasis is ours).

Consider again Chemero’s (2003) definition of affordances as relations between features of the environment and the abilities of organisms. The reference to “organisms” here can be read as relating to a particular organism here and now. Chemero seems to read organisms in this individualized way in his (2009, pp. 150-151, our italics) account of “affordances 2.0”:

“[C]onsider the interaction over time between *an animal’s* sensorimotor abilities [...] and its niche, that is the set of affordance available to *it*. [...] The key point here is that affordances and abilities are not just defined in terms of one another [...] but causally interact in real time and are causally dependent on one another.”

Note that any account of affordances that understands the affordances of something, say a leaf, in relation to a particular organism here and now - as Chemero’s (2009) account of “affordances 2.0” seems to -, will in the end not be able to do justice to the characteristic of affordances as having an existence independent of individual perceivers or as resources the environment offers in the way Reed (1996) emphasized. This is not an innocent theoretical mistake, but has implications for society as well. It would imply, for instance, that vacant school buildings, airports, or palaces that are locked up by the government that owns them to keep visitors out, do not offer any possibilities for action (affordances). To us that sounds absurd, because the potential to use these buildings in various ways is so clearly present. Moreover, such a position would contribute to ignoring and wasting the available resources in these places. We do not mean to imply

that Chemero (2009) makes this mistake. Elsewhere in his book he recognizes that the reality of affordances is independent of any particular animal perceiving and taking advantage of them (2009, p. 150). However in his account of affordances 2.0 this point is somewhat obscured.

We find our idea that affordances have an existence in the context of a form of life clearly states in Gibson (1979) when he writes:

“The concept of affordance is derived from these concepts of valence, invitation and demand but with a crucial difference. The affordance of something does *not change* as the need of the observer changes. The observer may or may not perceive or attend to the affordance, according to his needs, but the affordance [...] is always there to be perceived. An affordance is not bestowed upon an object by a need of an observer and his act of perceiving it. The object offers what it does because of what it is. To be sure, we define *what it is* in terms of ecological physics instead of physical physics, and it therefore possesses meaning and value to begin with. But this meaning is meaning and value of a new sort. For Koffka it was the *phenomenal* postbox that invited letter-mailing, not the *physical* postbox. But this duality is pernicious. I prefer to say that the real postbox (the *only* one) affords letter-mailing to a letter-writing human in a community with a postal system. [...] To feel a special attraction to it when one has a letter to mail is not surprising, but the main fact is that it is perceived as part of the environment – as an item of the neighborhood in which we live.” (Gibson, 1979, p. 138-139).

How can something possess “meaning [...] to begin with”, that is to say objectively, independently of the individual? From Wittgenstein (1953) we learn that we should understand this kind of objective meaning by looking at the form of life. It is worth noting how, in a similar way, in this quote Gibson makes it clear that it is *the practice* (i.e. “a community with a postal system”) in which an ability (e.g. writing letters) is embedded that matters if we are trying to understand the objective reality of affordances.

While the existence of affordances doesn't depend on the affordance-engagement of any particular individual, nor do they have an existence that is independent of an animal's form of life. Niches and forms of life are co-specifying, so if the animals belonging to a form of life should become extinct, the niche of this kind of animal will disappear too.

Affordances are just aspects of a niche, so if the niche to which an affordance belongs ceases to exist so also will the affordance. Still the aspect of the material environment may well continue to offer possibilities for other forms of life in which relevant abilities are to be found. A rake for instance can afford using to bring out of reach objects into an animal's reachable space. For any animal that has the ability to use the rake in this way it can afford bringing unreachable objects into reach. The relevant ability might include grasping the rake by the handle and not by the prongs.

Once we follow Gibson and Reed in seeing the ecological niche as primary and locate affordances in the context of a *form of life*, this gives affordances a reality independent from any individual animal's actual engagement with them here and now (cf. Heft 2001, p. 132-135).. The chairs in your office, for instance, continue to afford sitting on even when no one is sitting on them, or when everyone has left the building. It is, in part, the material structure of the chair that makes it the case that the chair affords sitting on to

someone with the appropriate ability, whether or not anyone happens to be actually using it at the time (c.f. Chemero 2009, pp. 149-50).

We suggest then that affordances are not relative to the abilities of a particular individual that actually perceives or detects the affordance. They have an existence that is relative to the skills available in the practice, or to use our preferred way of formulating this, to the abilities available in a form of life as a whole. Another way of putting this would be to say that affordances are relative to a form of life whose members could *potentially* detect the affordance (Chemero, 2009, pp. 149-150; Heft, 2001, p. 132). It is the individuals *qua* mobile members of a form of a life that have the potential to detect an affordance.

A comparison with a Wittgensteinian understanding of colours may prove instructive for appreciating the precise sense in which affordances can be said to be objectively real. Colours have a comparable kind of independence of existence from individual perceivers to that of affordances: an object is coloured independently of the experience of any particular individual. Objects are however arguably *not* coloured independently of our skilled practices, for instance of using colour samples to distinguish colours in particular situations. The same coloured object can appear very differently with changes in the lighting and viewing conditions. It is our ability, acquired in socio-cultural practice, that allows us to see the thing's colour despite variations in the way the colour of an object looks different under different viewing conditions (cf. Noë 2012).

This Wittgenstein-inspired account of the reality of colors finds an echo in John McDowell when he writes that while colours do not exist independent of our practices of naming and categorisation, they are nevertheless “*there* independently of any particular apparent experience of them” (McDowell, 1998e, p. 146, our italics). Such a conclusion is

also strongly supported by so-called “metameric matches”, where physically different stimuli (i.e. stimuli with different reflectance properties) are categorized as matching in colour (Hardin 1988; Thompson 1995). Affordances are real then in much the same way as colours are real. Both are there independently of any particular individual’s action, but not independently of the *practices and abilities* that characterise our form of life as a whole.

The affordances available in a form of life outstrip those available to an individual also in a second sense. Consider new inventions that extend the possibilities for action available in a form of life. Typically these inventions build upon the abilities and affordances already available in the various practices. They exploit the rich potentialities the environment already offers, for instance by making new combinations. An example from art history may illustrate this. The practice of oil painting was made possible by the invention of oil paint, which was created by combining already available substances in a new way: mixing a pigment and a drying oil into oil paint (Bol, 2012). Before that invention of oil paint people used drying oil for other purposes and mixed pigment with other substances, say egg yolk or glue. Our definition of affordances suggests that once the skill of mixing pigments with liquid substances – say egg yolk – was available in the practice, *drying oil already afforded making oil paint*: given the available skills, mixing drying oil into oil paint was already *a possibility for action available in the form of life* back then; an affordance or resource available to be picked up even before someone actually picked it up. Although more work needs to be done on the relation between innovation and affordances, this example shows that our account of affordances is able to do justice to the discovery of novel affordances and even suggests how this kind creativity can be promoted: namely by stimulating the application of an existing skill to different aspects of the environment.

As we have mentioned in the introduction, having a better conceptual understanding of the relational nature of affordances is important for creative professions because it suggests new ways of increasing our openness to these available resources. We have tested this in practice by making it part of the training of designers at a renowned art school, the Sandberg Institute of the Gerrit Rietveld Academy, specialized in the re-use of vacant buildings (Rietveld et al., 2014). We stimulated them to spend a period in an entirely different practice far outside the fields of art and architecture, e.g. life sciences, location scouting or container logistics. Due to their immersion in a different practice these participants acquired new skills that allowed them to come up with novel and often surprising tools for the reuse of vacant buildings.

What we are talking about here is the creation of new affordances or the picking up of unconventional ones. This typically requires “plodding” work and importing abilities from traditionally different domains (Sennett, 2008). This also implies that it is not only the richness of the material environment (as typically protected by cultural heritage agencies), but also the variety of crafts and other skills found within a form of life that deserve careful protection. These skills and practices also contribute to the richness of the human landscape of affordances.

What can we conclude about the reality of affordances from our discussion in this section? We’ve argued that affordances have an existence that is dependent on both the material environment and the abilities available in a form of life. Some humans can play the piano, but if people forever lost the knowledge of how to play, pianos would cease to afford playing music on. Thus affordances have an existence that is dependent on the abilities and practices found within a form of life. However these practices only exist because the material environment offers the possibilities for actions it does; our practices

are not independent of the material environment. The materials that pianos are made from have causal properties that explain why they can be used to play music with. To fully understand the reality of affordances, the causal properties of the things we employ in our practices are as important as our practices and abilities. While affordances do depend for their reality on the practices to be found in a form of life, this in no way compromises the reality of affordances. In short, if the material environment didn't offer the opportunities for action it does, our form of life wouldn't include the practices it does. Consider the way the invention of a new tool, say for instance diving equipment, can lead to the development of a new practice, that of diving. Similarly, the material structure of drying oil and pigment afforded making a new kind of paint, the use of which could then lead to the practice of oil painting. This account of affordances as being both relational and resources suggests that applying skills in unconventional ways can be sufficient to allow one to discover new affordances offered by already familiar aspects of our environment.

We have argued, in sum, that affordances can be said to be real in at least the following two senses. First the existence of an affordance doesn't depend on the active use of any particular member of a form of life. Affordances as relational properties depend for their existence both on aspects of the material environment and on the abilities available in a form of life. Second, our practices themselves are dependent on the opportunities for action offered by the material environment, in particular on the causal properties of things we put to use in the services of our projects and concerns, e.g. when creating tools or using a drying oil to make oil paint. The concrete activities we engage in as participants in a practice are adapted to the (changing) details of very particular material situations (Zukow-Goldring, 1997, 2012).

Affordances aren't simply properties of an animal's environment conceived of as a material or physical environment. It is the ecological niche of a particular form of life that is made up of affordances, and each affordance must be understood in relation to the abilities available in a form of life. In the case of humans these abilities are generally acquired through training and experience in socio-cultural practices.

4. An individual's engagement with affordances

We have distinguished affordances as they are found in the context of a form of life, from affordances as they show up for a particular acting individual. In this section we will say a little more about the latter level of analysis. Affordances are publicly available and in principle detectable by any individual with the right experience and training. At this level of the acting individual, affordances can be seen as usable *resources* already available in the environment to be picked up by an individual equipped with the relevant abilities (Reed, 1996; c.f. Chemero 2009: 136-40). The environment offers possibilities for action to the individual animal independently of its changing abilities (think not only of skills but also of fatigue and illness) and concerns.

What makes it the case then that a skilled individual is solicited by one affordance rather than another in a way that fits with the individual's concerns on a given occasion? This is an urgent open research question. In recent work on affordances and the applicability of that notion in the practice of architecture, for instance, Rob Withagen and his colleagues concluded that "clear progress" has been made in understanding the relation between the body and affordances, but that understanding "the *invitational* character of the environment still requires a lot of work to be done. When do affordances *solicit* movement? In the next few years we hope to collaborate with artists, architects and [...]

designers to better understand this invitational character of affordances. This could contribute to designing a healthier city in which people move a lot.” (Jongeneel, Withagen & Caljouw, in press, p. 8; our translation; our italics).

Experts bring their skills with them in every encounter with the environment (Dreyfus, 2002; Varela et al., 1991; Thompson, 2007). They encounter an environment overflowing with affordances, and they single out from among the available affordances just those that are relevant to their interests, preferences and needs (or what we will henceforth refer to as ‘concerns’) in the specific situation. They don’t need to select reflectively from the possible actions they can perform, the specific sequence of actions that is adequate to the specific situation. They perceive what action the specific situation demands. More generally, as an individual acquires a skill, she becomes increasingly able to adjust her actions to the specific demands of the given situation in which she finds herself. What the skilled person has learned to do over the years, feeds back into the way the meaningful world appears to her in perception. Merleau-Ponty (1945/2002) named this feedback loop the ‘*intentional arc*’ (c.f. Dreyfus 2002). As an agent acquires an increasingly sensitive capacity to discriminate between situations, so she also becomes increasingly sensitive to feedback from her own performance. She develops an increasingly nuanced critical eye with respect to the adequacy of her own actions and the consequences of those actions, learning to see what is adequate and what is not. Moreover, the exercise of this critical faculty is something the agent does unreflectively. Performing in ways that are adequately attuned to the demands of a concrete situation becomes second nature to the agent. To switch our sensory metaphors, experts develop a ‘nose’ that enables them to immediately sniff out which possibilities for action are better or worse in a specific situation.

We have already noted that on any given occasion the environment offers multiple possibilities for action to an agent. Some affordances the environment offers will be irrelevant to the agent because they have no bearing on the individual's concerns at the time. Other affordances will stand on the horizon as potentially relevant to the agent, such as the glass of water on my writing desk which is there ready for me to take a drink when I find myself with an urge to do so. An affordance (the glass of water to drink form) becomes a solicitation when it is relevant to our dynamically changing concerns (e.g. thirst). Finally there are affordances that command an agent to act on them here and now such as the door handle that invites pulling when we wish to enter a closed room. A particular affordance becomes a relevant affordance when it solicits or motivates an individual to engage with it in way that is adequate to the situation.

The ability to act adequately on affordances in the particular situation is dependent on an individual animal's dynamically changing abilities and concerns. The particular affordances one is engaged with in the concrete situation will vary with the current activity and concerns of the individual. We can be drawn to act on one affordance rather than another. We may for instance "feel a special attraction" to the mailbox when we have to mail a letter (Gibson 1979: 139). So what we can call the "demand character" or "solicitation" (Dreyfus & Kelly, 2007) of the affordance *is* related to the individual's current concerns (unlike the existence of the affordance). Typically, it will only be those affordances that are relevant to an individual's concerns that will invite or solicit an individual's actions.

Solicitation by an affordance is manifest in a states of bodily "action readiness" (Frijda, 2007, 1986). The detection of an affordance that is relevant to what the individual cares about in the particular situation gives rise to an embodied readiness for action (Rietveld,

2012a). In many real-life situations multiple states of action readiness interact in generating action tendencies and action.

The distinction between affordances and solicitations is important because from the multitude of affordances available to a member of a form of life located in a particular place at a particular moment, most will be irrelevant to the individual. The affordances we are normally drawn to act upon are the ones that are relevant to our concerns. Without this distinction, it is natural to wonder why our gaze should be drawn to one particular relevant affordance out of the whole landscape of affordances. Moreover, without this distinction architects and human movement scientists (such as Withagen and colleagues) interested in designing healthier living environments will not be able to understand why some affordances invite movement and others don't solicit that.

We suggest that it is our current abilities and concerns that make it the case that we are solicited by one affordance rather than another. Moreover, once we have available the notion of a solicitation, we can also recognise how sometimes the world can *motivate* us to act in certain ways. When we experience a particular tendency to act in a certain way, this is because we have been solicited by one of the many possibilities for action available in our situation.

5. Affordances for 'higher' cognition

We have seen in the previous sections how Gibson's (1979) notion of affordances is very broad, covering as wide a range of phenomena as can be found in a form of life. There is no need at all to limit engagement with affordances to a limited set of motor skills (e.g. grasping a cup, climbing stairs, sitting on chairs). The variety of affordances available to

us as humans is as rich and varied as the abilities and socio-cultural practices we are socialized into as human beings through processes of “enskilment” (Ingold, 2011/2000, p. 36), which take place in already structured material surroundings. Some human abilities are shared by all of us, some are not because we participate in different socio-cultural practices. Gibson (1979, p. 128) rightly points out that affordances include the *whole domain of social significance* and that:

“At the highest level, when vocalization becomes speech and human manufactured displays become images, pictures, and writing, the affordances of human behavior are *staggering*” (Gibson, 1979, p. 137, our italics).

The uniquely human ability for language use has allowed us to construct a niche unrivalled in the complexity of the possibilities for action it offers. Language opens up the possibility to be held to account by other people in our community for what we say and do. We will argue that these practices of giving and asking for reasons can also be made sense of in terms of skilled engagement with affordances. Abilities and practices like these have not typically been recognized as within the scope of investigation in ecological psychology. It is a virtue of our framework for understanding affordances that it can also be applied to allegedly ‘higher’ human abilities, such as the capacity to make *correct* perceptual judgements, an ability which is fundamental to propositionally articulable forms of knowledge. For instance, when we are out looking for mint leaves to make mint tea and a friend incorrectly reaches for a nettle we can stop him by making the judgement: “That is not a mint leaf; that is a nettle.” In doing so we are skillfully engaging with the affordances the nettle leaf has in our form of life: this leaf affords judging correctly that it is a nettle in our form of life.

Let's now return once more to our earlier question of what determines the correctness of the skilled practitioner's way of doing things. When we judge that the environment is a certain way (i.e. that the leaf is a nettle) we are answerable to other people for what we say. The judgements the environment affords are in part dependent on abilities available in social-cultural practices, and whether we respond correctly or not becomes a matter of agreement with those practices. What determines the appropriateness of an action will be the way we go on in this particular practice. It is the action being in agreement with the communal practice that decides whether a response to an affordance is correct. But if this is so do we not then lose the constraint from objective reality? It may seem that what provides the constraint on our judgement is no longer an objective reality. The correctness of a judgement seems to derive instead from it being in agreement with what other members of our community would say, or more broadly, do in the circumstances. By relativizing affordances to the abilities available in a form of life, we seem to run the risk of losing the friction from empirical reality that provides an objective constraint on our empirical judgements. How can we deal with this challenge?

We have suggested that an aspect of the environment counts as an affordance only in relation to abilities available in a form of life. So what determines the correctness of a judgement then will depend on *both* the material environment and the sociocultural practice. To give a very simple example, a red pen doesn't afford completing a customs form to be filled out in blue ink. The red pen doesn't offer this possibility for action partly because of its ink – a physical fact about the pen that can be seen as a constraint from the world, but also because of the norms that apply to the filling out of customs forms, what our practice requires us to do. The empirical constraint on our perceptual judgements comes not from an experience inside of someone's head, but the environmental affordances present in our niche.

Consider in this light Gibson's (1979, pp. 157-158) example of the perceived cliff. Gibson notes that there is a certain primacy to perceiving the affordances of the cliff edge. He writes: "What animals need to perceive is not the layout as such but the affordances of the layout [...]" (Gibson, 1979, pp. 158-159). Given the abilities available in our form of life, the layout (or more broadly the structure) of the environment affords a multiplicity of possibilities for action: it affords being perceived, it affords calling it correctly a cliff, it affords looking down safely by laying flat on the ground and looking over the edge, it affords asserting or judging that this cliff is a dangerous place for a children's soccer game, it affords taking a piece of substance from the cliff's wall and analyzing it chemically in one's lab, etc. Importantly, there are also certain things the cliff does not afford; it is not the case that everything is possible. There are certain *constraints* imposed on us by the materiality and layout of the environment as well as the practices and abilities that we have: for instance, the cliff edge does not afford locomotion, describing it as a flat plane, or flying to New York.

The affordance of correctly naming this part of a landscape "a cliff" is an obvious example of an affordance that has normativity at its core. For philosophers this kind of affordances is important because seeing and/or stating correctly how things really are, is fundamental to knowledge acquisition. For Gibsonians this should be of interest as well, because when Gibson (1979, pp. 127-128, our italics) relates affordances to "the *whole spectrum* of social significance" this obviously includes the pursuit of knowledge.

We suggest then that affordances conceptualized in the right way already provide the necessary constraint on our perceptual judgements from empirical reality. We can find a similar observation in Gibson's work:

“If the affordances of a thing are perceived correctly, we say that it looks like what it *is*. But we must, of course, *learn* to see what things really are — for example, that the innocent-looking leaf is really a nettle or that the helpful-sounding politician is really a demagogue. And this can be very difficult.”
(Gibson, 1979, p. 142)

We can say that things afford perceiving what they really are. The letters appearing on our laptop screen as we preparing a powerpoint-presentation, for instance, provide the possibility to judge correctly that their colour is red, just as we intended them to be. When in a store buying a tie, the tie affords perceiving correctly what colour it really is by taking it to the part of the store where it can be viewed under natural light. This is a possible action the tie offers us only because we have acquired the ability to correctly make colour judgments, i.e. a practical understanding of the ways in which an object's colour can look different under different viewing conditions. Moreover, normally when we engage with an affordance, the precise actions we perform are adapted and dynamically calibrated to way things are in this particular situation (see the example of an architect at work in Rietveld 2008). The concrete activities we engage in as participants in a practice are adapted to the (changing) details of very particular material situations. Researchers concerned with the distributed nature of cognitive processes have made this observation as well, using a very different conceptual framework to describe it (Hutchins, 1995; Perry, 2010).

It is the world, the soliciting relevant affordance encountered in a concrete situation, which motivates an individual agent to do one thing rather than another. As I am typing this text and I am unreflectively drawn to drink from the cup of coffee that stands

besides my laptop, I am engaging with one of the cups many affordances. My coffee cup invites me to drink coffee from it, but it also offers the possibility of using language to express that the cup I am grasping has “1369 COFFEE HOUSE” written on it.

The analysis of affordances we have proposed provides a framework for understanding both the similarities and differences between non-human animals and humans:

“People are animals evolved on our planet, just like all other animals. We are unique in that we have our distinctive way of life-our own ecological niche, if you will-but every animal species has its own unique way of life as well.”
(Reed, 1996, pp. 96-97).

Whatever differences we find between human and non-human animals can be traced to *abilities*, developed within different niches and practices. Within our niche – the niche of a form of life with certain linguistic abilities – a skilled language user can for example be solicited to do many of the things that humans can do with language (Austin 1962; H.H. Clark 1996).

6. Conclusion: Implications of the skilled practice perspective on affordances for empirical research, philosophy and society

The analysis of affordances we have proposed in this paper is not only of philosophical and theoretical relevance in the ways we have been elaborating so far, but it also has the potential to assist (embodied and embedded) cognitive science with a number of long standing problems. Consider for instance the context-sensitivity of expert intuition and skilled interactions with our environment in everyday life. The problem of how to

characterize and account for *context* remains a central, unsolved problem in cognitive science (Haselager & Van Rappard, 1998; Wheeler, 2005; Barrett, Mesquita & Smith, 2010; Dreyfus, 2008). How can we scientifically account for an agent's ability to select the action that is appropriate to the particularities of the situation given that there is always an open-ended number of possible actions available to them? Affordances understood along the lines we have proposed can help scientists to ask the right questions for addressing this problem. Interestingly, in our account "context" is interpreted as the rich landscape of affordances in which skillful action unfolds. As we have seen in the last section, affordances for 'higher' cognition are simply among the aspects that can be found in this landscape. Once we understand our skilled engagement with this landscape better, we will also understand context-sensitivity better (see Rietveld, 2008, 2012b; Kiverstein & Rietveld, 2012; Rietveld et al., 2013). This brings the context back into cognitive science.

Embodied cognitive science (Chemero, 2009; Thompson, 2007; Varela, Thompson & Rosch, 1991) has, from the earliest days, faced the objection that while the explanations it proposes may work well enough for sensorimotor behaviour, these explanations will fail to scale up to so-called 'higher' cognition (Kirsh, 1991). The examples that are normally given of 'higher' cognition include cognitive capacities like the ability to reason about the distal, absent and non-existent, language understanding, mathematical and logical problem solving. These have all been taken to be examples of "representation-hungry" cognition (Clark & Toribio, 1994). Assuming that these are modes of cognition that depend on the manipulation of representations of some sort, it might be thought that these are modes of cognition that cannot be amenable to explanation in terms of engagement with affordances. Once, however, we take seriously the idea that affordances are dependent on the abilities available in a form of life, we believe this

opens up new possibilities for tackling the problem that ‘higher’ cognition has presented to embodied cognitive science so far. It raises the possibility of accounting for ‘higher’ cognitive capacities in terms of skillful activities in practices, and in terms of the material resources exploited in those practices.

Seen from this perspective, the supposed gap between ‘lower’ and ‘higher’ cognition is a largely artificial and problematic dichotomy. Just like skilled ‘lower’ cognitive activities, skilled ‘higher’ cognition can be understood in terms of selective engagement – in concrete situations – with the rich landscape of affordances. This generates a need for studying ‘higher’ cognition in the particular real-life contexts and situations in which it is deployed. How for instance do architects use affordances to solve problems that show up in their design process (Rietveld et al., 2014).

At the ground floor level we share with non-human animals, perception can be understood as openness to affordances. This conclusion is important for philosophy (as we have seen in section 5). Openness to affordances we take to be an individual’s readiness to engage with relevant opportunities for action. To be more precise, openness to affordances consists in a readiness to act in ways appropriate to a particular concrete situation, something we are prepared for and know how to do due to the training one received in acquiring a skill (cf. McDowell, 1998b, p. 64).

One final area in which we have begun to apply the ideas set out in this paper is in psychiatry, to understand the changes that patients suffering with Obsessive Compulsive Disorder (OCD) undergo when undergoing treatment with Deep Brain Stimulation (Rietveld et al., 2013; De Haan et al., 2013). We have suggested in these papers that some psychiatric disorders may have a global effect on affordance-engagement, disturbing a

person's responsiveness to social affordances, place affordances, epistemic affordances, and possibilities for reflection. This hypothesis has proven helpful in interpreting the changes in first-person experience OCD-patients report as brought about by DBS treatment. Patients experience a rapid and global change in their orientation to the world that isn't described well using the available psychiatric scales (of the DSM). The latter typically focus on symptoms only and ignore the way in which a disorder effects things globally: social interactions, a person's openness towards the world, and engagement with affordances the world has to offer more generally. It is necessary to take into account the changes in the patient's affordance-engagement and first-person experience however if we are to completely understand the impact of DBS on a patient, and if we are to assess a patients' well-being. The latter is an important factor in the determination of changes in DBS-parameter settings and treatment more generally.

Combining qualitative research methods with a phenomenological analysis of the patients' experience that relies on the analysis of affordances we have provided above, it was observed that the patients' whole way of being in the world seemed to have changed before and after treatment with DBS (De Haan et al., 2013). [ADD FIGURE 1 around here. Figure 1. Sketch of different fields of relevant affordances (from De Haan et al., 2013, p. 7).]

Our framework for understanding embodied cognition - of which readiness for and engagement with affordances is a key component - helped us to understand and systematise the broad range of changes in first-person experience patients report. More specifically we proposed that what changed in the OCD-patient following DBS treatment was their relation to the field of relevant affordances along the following three dimensions: (1) broadness of scope of affordances engaged with ('width' of the field), (2)

temporal horizon/anticipation ('depth'), and (3) relevance of the perceived affordances ('height'). With respect to the impact of DBS it was concluded that after the treatment the patient's field of relevant affordances reflects their concerns beyond the (earlier dominating) mere urge to reduce the strong tension and anxiety that is typical of OCD. That is, their field of affordances now reflects what really matters to them once the distortion of anxiety is lifted. In other words, thanks to the treatment a more diverse and balanced field of relevant affordances is regained.

The idea that many of the affordances available to the human species are publicly available for us is potentially of great social, cultural and economic importance. For example, this perspective makes vacant buildings show up as extremely rich "nests" of resources. It is the enormous potential of these that was explored in the exhibition Vacant NL at the Venice Architecture Biennale 2010 and presented in the Dutch Atlas of Vacancy. In the Netherlands there are currently thousands of government buildings lying vacant. These buildings include a great variety of spaces as they were once designed for specific purposes: lighthouses, hospitals, water towers, factories, airports, hangars, offices, rehabilitation centres, fortresses, bunkers, schools, swimming pools and so much more. These unique buildings were constructed in different eras, with function, crafts and the use of materials being time specific. These buildings therefore are *non-reproducible*. Thanks to this diversity, the vacant properties provide countless affordances. The irreplaceable possibilities for action offered by vacancy will invite all sorts of experimentation from entrepreneurs (or, more broadly, initiators) with innovative ideas when they are given access to this reservoir of resources. A vacant school, for instance, is a resourceful place in the landscape of affordances that could be used for many different purposes if it were to be unlocked: for example a movie set, a gallery space or a workspace for young app makers.

Our ecological niche is much richer than we might have supposed. Part of this potential is related to the variety in its physical structures (for instance the variety of buildings from different epochs and cultures) and part of it is related to the diverse repertoire of human abilities. Every concrete situation offers an enormous amount of valuable possibilities for action that may motivate human beings (some of affordances already did so for millennia, for instance possibilities for action related to social activities around hearths, camp fires and pigments). It is because they might be worth doing for us as well, that our continuous openness and exploration of affordances make sense.

“The perceiving of an affordance is [...] a process of perceiving a value-rich ecological object. Any substance, any surface, any layout has some affordance for benefit or injury to someone. Physics may be value-free, but ecology is not.” (Gibson, 1979, p. 140).

Given that all these value-rich affordances are publicly available, could we perhaps say that it is only our ignorance and lack of skill that limit our tapping into these potentially valuable resources for our practices? If so, such an insight might require us to rethink our educational practices (Rietveld, et al., 2014). Should we perhaps pay more attention to the skill of being open to the detection of unconventional but relevant affordances? Should we ourselves perhaps try to be more like Peter the Great of Russia and increase our exposure to other (sub)cultures (practices) in order to learn about their skills and the value-rich affordances they perceive? What they find worth doing might very well be of interest to us as well.

References

- Austin, J.L. (1962) *How to do things with words. The William James Lectures delivered at Harvard University in 1955*. Oxford: Clarendon Press.
- Barrett, L. F., Mesquita, B., & Smith, E. R. (2010), The context principle. In B. Mesquita, L.F. Barrett & E.R. Smith (Eds.) *The Mind in Context*. London: Guilford Press.
- Bol, M. (2012) *Oil and the Translucent. Varnishing and glazing in practice, recipes and historiography, 1100-1600*. Doctoral dissertation Utrecht: University of Utrecht.
- Chemero, A. (2003) An outline of a theory of affordances, *Ecological Psychology*, 15 (2), 181-95.
- Chemero, A. (2009) *Radical Embodied Cognitive Science*. Cambridge, MA: MIT Press.
- Clark, A. & Toribio, P. (1994) Doing without representing. *Synthese* 101 (3), 401-31.
- Clark, H.H. (1996) *Using Language*. Cambridge: Cambridge University Press.
- Darwin, C.R. (1881) *The Formation of Vegetable Mould, Through the Actions of Worms, with Observations on Their Habits*. London: John Murray.
- De Haan, S., Rietveld, E., Stokhof, M., & Denys, D. (2013) The phenomenology of deep brain stimulation-induced changes in OCD: an enactive affordance-based model. *Frontiers in Human Neuroscience* 7 (653), pp. 1-14.

Dreyfus, H.L. (2008), Why Heideggerian AI failed and how fixing it would require making it more Heideggerian. In P. Husbands, O. Holland & M. Wheeler (Eds.) *The Mechanical Mind in History*. Cambridge, MA: MIT Press, pp. 331-71.

Dreyfus, H.L. & Kelly, S.D. (2007) Heterophenomenology: Heavy-handed sleight-of-hand. *Phenomenology and the Cognitive Sciences* 6, 45-55.

Gibson, J.J. (1979) *The ecological approach to visual perception*. Boston: Houghton Lifflin.

Hanfling, O. (2002) *Wittgenstein and the human form of life*. London: Routledge.

Hardin, C.L. (1988) *Colour for Philosophers: Unweaving the Rainbow*. Indianapolis, IN: Hackett Publishing Company.

Haselager, W.F.G. & Van Rappard, J.F.H., (1998). Connectionism, systematicity, and the frame problem. *Minds and Machines* 8, 161-79.

Heft, H. (2001) *Ecological Psychology in Context: James Gibson, Roger Barker, and the Legacy of William James's Radical Empiricism*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Hutchins, E. (1995) *Cognition in the Wild*. Bradford: MIT Press.

Ingold, T. (2011/2000) *The Perception of the Environment: Essays on Livelibood, Dwelling and Skill*. London: Routledge.

Ingold, T. (2013) *Making: Anthropology, Archaeology, Art and Architecture*. New York: Routledge.

Kirsh, D. (1991). Today the earwig, tomorrow man? *Artificial Intelligence* 47 (1-3), 161-184.

Kiverstein, J. & Rietveld, E. (2012) Dealing with context through action-oriented predictive processing. *Frontiers in Theoretical and Philosophical Psychology* 3 (421), pp. 1-2.

Koffka, K. (1935) *Principles of Gestalt Psychology*. New York: Harcourt, Brace.

Laland, K.N., Odling-Smee, J. & Feldman, M.W. (2000) Niche Construction, Biological Evolution, and Cultural Change. *Behavioural and Brain Sciences* 23, 131-146

McDowell, J. (1998a) Two sorts of naturalism, in *Mind, Value, and Reality* (pp. 167-197). Cambridge, MA: Harvard University Press.

McDowell, J. (1998b) Virtue and reason, in *Mind, Value, and Reality* (pp. 50-73). Cambridge, MA: Harvard University Press.

McDowell, J. (1998c) Wittgenstein on following a rule, in *Mind, Value, and Reality* (pp. 221-262). Cambridge, MA: Harvard University Press.

McDowell, J. (1998d) Meaning and intentionality in Wittgenstein's later philosophy, in *Mind, Value, and Reality* (pp. 263-278). Cambridge, MA: Harvard University Press.

McDowell, J. (1998e) Values and Secondary Qualities, in *Mind, Value, and Reality* (131-150). Cambridge, MA: Harvard University Press.

McDowell, J. (2007a) What Myth? *Inquiry* 50 (4), pp. 338-351.

McDowell, J. (2007b) Response to Dreyfus. *Inquiry* 50 (4), pp. 366-370.

Merleau-Ponty, M. (2002/1945) *Phenomenology of Perception* (Smith, C., trans.). London: Routledge.

Michaels, C.F. (2003) Affordances: Four points of debate. *Ecological Psychology*, 15 (2), pp. 135-148.

Noë, A. (2004) *Action in Perception*. Cambridge, MA: MIT Press.

Noë, A. (2006) *Novel Experiences or on Overintellectualizing the Intellect*. Unpublished draft paper.

Perry, M. (2010) Socially distributed cognition in loosely coupled systems. *AI & Society* 25, pp. 387-400.

Reed, E. S. (1996). *Encountering the World: Toward an Ecological Psychology*. Oxford: Oxford University Press.

Rietveld, E. (2008) Situated normativity: The normative aspect of embodied cognition in unreflective action. *Mind* 117 (468), pp. 973-1001.

Rietveld, E. (2012a) Bodily intentionality and social affordances in context, in Paglieri, F. (ed.) *Consciousness in Interaction. The Role of the Natural and Social Context in Shaping Consciousness*. Amsterdam: J. Benjamins, pp. 207-226.

Rietveld, E. (2012b) Context-switching and responsiveness to real relevance, in Kiverstein, J. & Wheeler, M. (eds.) *Heidegger and Cognitive Science: New Directions in Cognitive Science and Philosophy*. Basingtoke, Hampshire: Palgrave Macmillan, pp. 105-135.

Rietveld, E., De Haan, S. & Denys, D (2013) Social affordances in context: What is it that we are bodily responsive to? Commentary on Schilbach et al. *BBS, Behavioral and Brain Sciences* 36 (4).

Rietveld, R., Rietveld, E., Bey, J., Mackic, A., Visser, B., Van de Wiel, E. & Zoeteman, M. (2014) *Vacancy Studies: Experiments and Strategic Interventions in Architecture*. Rotterdam: NAI010 publishers.

Sennett, R. (2008) *The Craftsman*. Yale University Press.

Silva, P., Garganta, J., Araújo, D., Davids, K. & Agular, P. (2013) Shared knowledge or shared affordances? Insights from an ecological dynamics approach to team coordination in sports. *Sports Medicine* 34, pp. 765-772.

Stein, H.P. (1997) *The Fiber and the Fabric: An Inquiry into Wittgenstein's Views on Rule-Following and Linguistic Normativity*. Ph.D. Thesis. University of Amsterdam/ILLC, Amsterdam.

Thompson, E. (1995) "Colour vision, evolution and perceptual content." *Synthese* 104 (1): 1-32

Thompson, E. (2007) *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*. Cambridge MA: The Belknap Press of Harvard University Press.

Varela, F.J., Thompson, E. & Rosch, E. (1991) *The embodied mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.

Wheeler, M. (2005), *Reconstructing the Cognitive World: The Next Step*. Cambridge, MA: MIT Press.

Wittgenstein, L. (1953) *Philosophical Investigations*. Oxford: Blackwell.

Wittgenstein, L. (1983/1956) *Remarks on the Foundations of Mathematics*. Revised edition. Cambridge, MA: MIT Press.

Wittgenstein, L. (1978) Lectures on aesthetics, in Wittgenstein, L., *Lectures and Conversations on Aesthetics, Psychology and Religious Belief* (pp. 1-40). Oxford: Blackwell.

Wittgenstein, L. (1993) Cause and effect: Intuitive awareness, in J.C. Klagge & A. Nordmann (Eds), *Philosophical Occasions 1912-1951* (pp. 368-426). Indianapolis: Hackett Publishing Company.

Zukow-Goldring, P. (1997) A social ecological realist approach to the emergence of lexicon: Educating attention to amodal invariants in gesture and speech, in Dent-Read, C. & Zukow-Goldring, P. (eds), *Evolving Explanations of Development: Ecological Approaches to Organism – Environment Systems*. Washington, DC: American Psychological Association, pp. 199-250.

Zukow-Goldring, P. (2012) Assisted imitation: First steps in the seed model of language development. *Language Sciences* 34, pp. 569-582.