

HABITAT

**ECOLOGY THINKING
IN ARCHITECTURE**

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ARCHITECTURE AND ECOLOGICAL PSYCHOLOGY

RAAAF's Explorations of Affordances



RAAAF and Atelier de Lyon, *Bunker 599*, Culemborg, 2013

¹ James Jerome Gibson, *The Ecological Approach to Visual Perception* (Boston: Houghton Mifflin Harcourt, 1979), 140.

² Erik Rietveld, *Unreflective Action: A Philosophical Contribution to Integrative Neuroscience* (Amsterdam: ILLC Dissertation Series, 2008); and Erik Rietveld, 'Situating Normativity: the Normative Aspect of Embodied Cognition in Unreflective Action', in *Mind* 177/468 (2008), 973-1001.

³ Rietveld's work at the University of Amsterdam has been supported by NWO VENI and VIDI grants, as well as an ERC Starting Grant. For more about Rietveld's research, see www.erikrietveld.com.

⁴ Gibson, *The Ecological Approach*, op. cit. (note 1), 127-128.

⁵ This is based on Wittgenstein's notion of *feste Lebensformen*, see Ludwig Wittgenstein, 'Cause and Effect: Intuitive Awareness', in: James Carl Klagge and Alfred Nordmann (eds.), *Philosophical Occasions 1912-1951* (Indianapolis: Hackett, 1993), 397.

⁶ Gibson, *The Ecological Approach*, op. cit. (note 1), 137.

⁷ Erik Rietveld and Julian Kiverstein, 'A Rich Landscape of Affordances', *Ecological Psychology* 26/4 (2014), 235-352.

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. — James Gibson ¹

One of the themes behind habitat is the notion that the built environment should not be understood as a collection of static objects, but as a dynamic or ecological system, thus introducing a process-based and relational approach to architecture and planning. This view is a cornerstone of the work of RAAAF [Rietveld Architecture-Art-Affordances], a studio founded by architect Ronald Rietveld and philosopher Erik Rietveld in 2006 that operates at the crossroads of visual art, architecture and philosophy. RAAAF makes architectural installations, interventions and works of art that question practices in our contemporary living environment. These practices range from everyday entrenched habits such as sitting too much to issues of social cohesion and public space to institutional conservation practices or the temporary use of vacant buildings. Through a working method based on multidisciplinary research conducted with scientists and other specialists, these real-life thinking models link local qualities with long-term strategies aimed at influencing societal, social or institutional developments. As the name suggests, RAAAF's installations create *affordances*, a concept from ecological psychology that signifies possibilities for action provided by the environment. In parallel and in conjunction with the work of RAAAF, Erik Rietveld's research group at the University of Amsterdam has been investigating this notion for over a decade. Based on earlier philosophical work on skilled action,² this ongoing research project explores how affordances can be relevant not just to the fields of philosophy and psychology, but also to cognitive science, psychiatry and architecture.³ The way RAAAF employs the concept of affordances for its interventions can serve as an inspiring contemporary example of an approach to architecture that no longer thinks in terms of objects, form and construction, but rather in terms of processes, systems and ecological niches.

Ecological Psychology and the Rich Landscape of Affordances

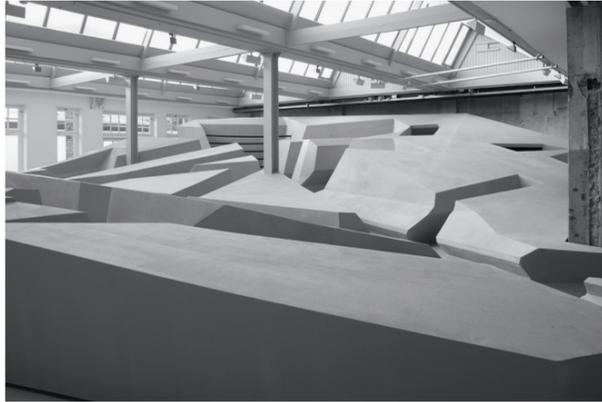
The notion of affordances was introduced by ecological psychologist James Gibson, who was among the first to stress the importance of our environment and its perception to the field of psychology. Affordances are possibilities for action provided to an animal (including

humans) by the environment: by the substances, surfaces, objects and other living creatures that surround the animal. Generalizing somewhat, we can say, for example, that surfaces afford locomotion and support, substances afford nutrition and manufacture, objects afford manipulation, other animals afford a variety of interactions and other people afford, as Gibson put it, 'the whole spectrum of social significance'.⁴ What is common to human beings is not just the biology we share but also how we are embedded in sociocultural practices: our relatively stable shared ways of getting on and living with others that we, following Austrian philosopher Ludwig Wittgenstein, have called the human form of life.⁵

Each species of animal has its own distinctive form of life, which is reflected in Gibson's definition of the concept of an ecological niche. For Gibson, an ecological niche is built and transformed by members of the species through their patterns of behaviours. All animals actively modify their niches, tailoring the places they inhabit to match their needs – from nests, holes, burrows, paths and webs all the way up to squares, streets, houses and cities. Note the materiality of the environment that offers affordances: the organism alters the material environment in order that the latter offers possibilities for action that may improve the organism's situation. But an ecological niche is not just material: it is best seen as an evolving process of interconnected affordances available in a particular form of life on the basis of the abilities manifested in its collective practices – its relatively stable ways of doing things. An individual affordance is an aspect of such an ecological niche, and each affordance must be understood in relation to the abilities available in a form of life.

Some human abilities are shared by all of us; others are not, because we participate in different sociocultural practices. Gibson has pointed out that 'at the highest level, when vocalization becomes speech and human manufactured displays become images, pictures and writing, the affordances of human behaviour are staggering'.⁶ Traditionally, affordances have been understood primarily as a concept applied to 'lower' motor cognition such as grasping a cup or riding a bike. However, within the framework developed at the University of Amsterdam, we have proposed thinking of 'higher' cognitive capacities as well, in terms of skilled activities in sociocultural practices in relation to the material resources available in those practices.⁷ Both 'lower' motor cognition and skilled 'higher' cognition can thus be equally understood in terms of a situated and selective engagement with a rich landscape of affordances.

In order to do justice to this relationship with our ecological niche and its potential for our understanding



RAAAF and Barbara Visser, *The End of Sitting*, Amsterdam, 2014

Erik Rietveld testing positions in a mock-up for *The End of Sitting*



⁸ For more about the notion of *sociomateriality*, which holds that the material and the social aspects of our environment are entangled and cannot be clearly separated, see Ludger van Dijk and Erik Rietveld, 'Foregrounding Sociomaterial Practice in Our Understanding of Affordances: The Skilled Intentionality Framework', *Frontiers in Psychology* 7 (2017); and Ludger van Dijk and Erik Rietveld, 'Situating Anticipation', *Synthese* (2018).

⁹ Ronald Rietveld and Erik Rietveld, *Dutch Atlas of Vacancy* (Rotterdam: NAI Publishers, 2010); Erik Rietveld and Ronald Rietveld, 'The Dutch Atlas of Vacancy', in: Ronald Rietveld and Erik Rietveld (eds.), *Vacancy Studies: Experiments and Strategic Interventions in Architecture* (Rotterdam, nai010 publishers, 2015), 51-78.

¹⁰ Van Dijk and Rietveld, 'Foregrounding Sociomaterial Practice', op. cit. (note 8).

¹¹ The theoretical background of social affordances in relation to this project are elaborated in Erik Rietveld, Ronald Ronald and Janno Martens, 'Trusted Strangers: Social Affordances for Social Cohesion', *Phenomenology and the Cognitive Sciences* 18/1 (2019), 299-316.

of so-called 'higher' cognition, our research group has defined affordances as relationships between aspects of the sociomaterial environment in flux and abilities available in a form of life.⁸ In the case of humans, these available abilities are generally acquired through training and experience in sociocultural practices. Our ecological niche is therefore much richer than many might have supposed, including the vast amount of possibilities offered by complex skills such as reasoning, language use and advanced social functions. Having a better conceptual understanding of the relational nature of affordances is vital to creative professions, because it suggests new ways of increasing our openness to underutilized affordances.

RAAAF demonstrated an architectural application of this principle in the exhibition 'Vacant NL', in the Dutch pavilion at the 2010 Venice Architecture Biennale, emphasizing the potential of the affordances offered by vacant buildings in the Netherlands. The affordances they presented should be seen as relationships between the variety of the physical structures (older buildings, often built for very specific purposes) and the diverse repertoire of human abilities. 'Vacant NL' explored the qualitative aspects of vacancy and revealed the extremely rich 'nests' of resources these buildings represent.⁹ In the Netherlands there are thousands of vacant buildings – not just offices, but, crucially, many unique structures with a great variety of spatial qualities as well, since they were once designed for specific purposes: lighthouses, hospitals, water towers, factories, airports, hangars, offices, rehabilitation centres, fortresses, bunkers, schools, swimming pools and so many others. All of these buildings were constructed at times when function, craftsmanship and the use of materials were approached differently than today, which renders many of them non-reproducible. Their diversity and unique properties distinguish them from the generic spaces of vacant contemporary office space and present irreplaceable possibilities for action – affordances – that will invite unexpected experimentation were this reservoir of resources unlocked. A vacant school, for instance, is a resource-rich place in the landscape of affordances that could be used for many different purposes: as a movie set, for example, a gallery space or a workspace for young art makers.

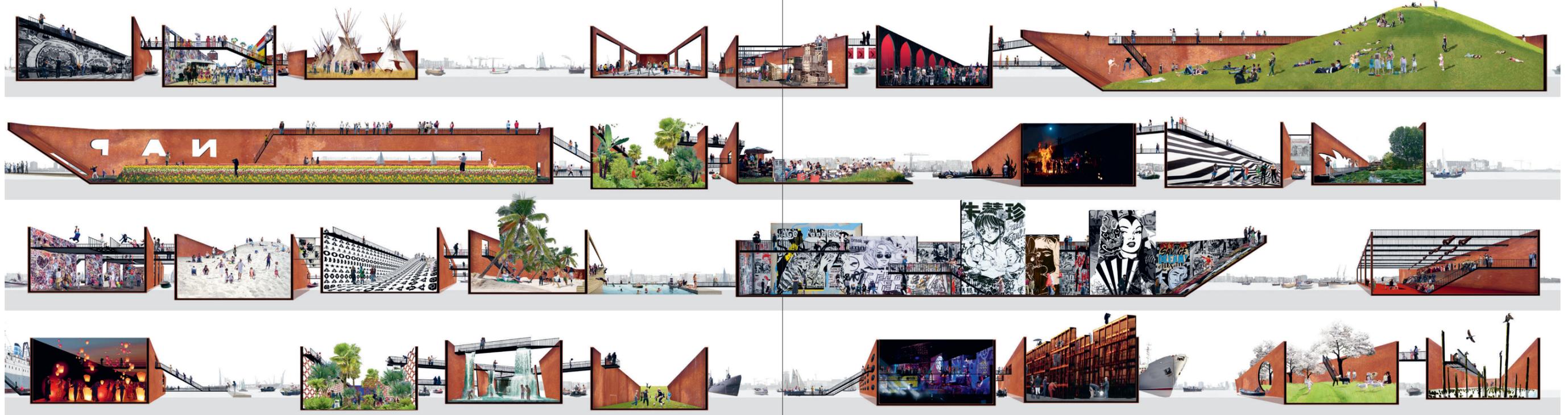
Architecture and Social Affordances

Since the notion of affordances in our definition extends beyond just physical action and includes the social domain as well, RAAAF has been particularly interested in the design of social affordances. Social affordances are a subcategory of affordances: possibilities for social

interaction or sociability provided by the environment. Social affordances can invite social interactions that over time, if engaged in by sufficient numbers of people, may result into transformed patterns of behaviour – that is, into transformed sociocultural practices.¹⁰

This idea was used as the premise for one of RAAAF's boldest proposals to date, located in Amsterdam. In 2025, Amsterdam will be 750 years old, and the city wants to use this occasion to celebrate its free-thinking heritage. Taking into account the urgent need for good public domain along with our own research into and views on how to create such spaces, RAAAF and Atelier de Lyon responded to this objective by proposing a temporary floating park called *Trusted Strangers | New Amsterdam Park (N.A.P.)*. Along the northern bank of the River IJ and the former dockyard that overlooks Amsterdam's historical city located across the water, a fleet of barges will be docked, forming the basis of the new floating park. A grid of 24 large barges (each 80 m long, 11 m wide and 6 m high) will shelter a hidden water world with an abundance of social affordances.

Twelve of these barges will be temporarily occupied by different sociocultural groups, each allowed to have a barge furnished according to its own preferences. The members of these groups share interests and manifest shared patterns of behaviour, which we broadly defined as 'subcultures' to determine the programme and properties of a specific barge. For example, one barge could accommodate skaters by including halfpipes, spine transfers and banked ramps, while another could be furnished to host bird watchers by incorporating lookouts into the superstructure. This is also the idea behind the other twelve areas of the park, but instead of catering to a specific subculture, the remaining barges provide landscapes of social affordances with a broader appeal: the Campfire Barge, for example, invites the gathering of people who like to be warm (who doesn't?), while the Panna Barge attracts people from different sociocultural groups who like to play soccer. A barge filled with sand dunes has a similar potential: sand is a compelling social affordance where children and parents from different subcultures can meet. Its attractive location and inviting design encourage people to leave their 'own' subcultural barge and join others in a common activity. By accommodating both subcultural niches as well as 'public' activities with a broad appeal, the park becomes a condensed city floating on the water. And because these barges' social affordances are made to be attractive for people with diverse sociocultural backgrounds, they are able to generate new patterns of behaviour and invite surprising spontaneous interactions.¹¹



RAAAF and Atelier de Lyon,
N.A.P. (New Amsterdam Park),
interior views of the barges
on the IJ river in Amsterdam

RAAAF and Atelier de Lyon,
N.A.P. (New Amsterdam Park),
overview of the park





RAAAF, *Breaking Habits*, Amsterdam, 2017

¹² Ivan Nio, Arnold Reijndorp and Wouter Velthuis, *Atlas Westelijke Tuinsteden Amsterdam: De geplande en de geleefde stad* (Haarlem: Trancity, 2008), 134; cf. Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961).

¹³ VROM advisory council, *Stad en stijging: Sociale stijging als leidraad voor stedelijke vernieuwing. Advies 054* (The Hague: VROM Advisory Council, 2006), 58.

¹⁴ Julian Kiverstein, Mark Miller and Erik Rietveld, 'The Feeling of Grip: Novelty, Error Dynamics and the Predictive Brain', *Synthese* 196/7 (2019), 2847-2869.

¹⁵ It should be noted, however, that further research is needed to establish how this finding holds over longer periods of time and with an older population. See Rob Withagen and Simone R. Caljouw, 'The End of Sitting: An Empirical Study on Working in an Office of the Future', *Sports Medicine* 46/7 (2016), 1019-1027.

¹⁶ *Ibid.*, 1019.

Familiarity and trust are crucial for the social fabric of the city, and good public spaces are imperative for achieving this. In their study of ethnic and social diversity in Amsterdam's Westelijke Tuinsteden district, authors Ivan Nio, Arnold Reijndorp and Wouter Veldhuis emphasized that this familiarity with others forms the core of well-functioning public spaces. They argue that such spaces foster interactions, and their study underlines the importance of people becoming 'familiar strangers' to their neighbours.¹² This view was echoed in a report from the Dutch advisory council on housing, spatial planning and the environment (VROM-raad), which concluded that a lack of social cohesion is primarily to be understood as a lack of such experienced public familiarity, or, more precisely, as a lack of familiar strangers in the street or neighbourhood.¹³ The opportunity to observe groups of 'strangers' and subcultures from a distance is essential to becoming familiar with their ways of doing things in order to become 'trusted familiar strangers'.

This notion of trusted strangers served as the project's premise: observing and being observed is made possible by the material environment (portholes, cut-throughs and the meandering overhead pathways all contribute to this) and is essential to the culture of this park. Sailing through the 'water streets' by boat or walking through the dense labyrinth of barges, staircases, bridges and overhead pathways generates a series of informal encounters, confrontations, exchanges and gatherings. The configuration of the barge grid, combined with routes over water and over the barges, ensures that people cannot simply stick to their familiar surroundings. Due to the changing programme of the twelve barges dedicated to specific groups, visitors will dynamically encounter many different worlds and subcultures.

One of the other key aspects of the *New Amsterdam Park* is that all spaces are to be freely accessible to the public. The open character of the park ensures that visitors can roam freely and over time explore more and more aspects of the park. This opportunity to roam freely is important: as recent work in theoretical computational neuroscience shows, humans display a tendency to gradually explore larger and larger aspects of their ecological niche.¹⁴ This offers a dynamic perspective of how people will appropriate their environment over time, which has been incorporated in the proposal. The architecture of the park is designed in such a way that we expect people, who at first naturally gravitate towards the barge that aligns most with their own interests and subculture, will eventually respond to more and more of the social affordances offered by the park. It should therefore be understood not just as a landscape in the classical physical sense, but also as a rich landscape of social affordances.

Real-Life Thinking Models

As the *N.A.P.* project makes clear, the creation of particular affordances can allow for a change in social patterns, which is something RAAAF incorporates in virtually all of its projects. Some projects, however, like *The End of Sitting* (2014), are also concerned with the less tangible goal of changing the entrenched practices or conventions of our human ecological niche. By showing what the world might look like if our material environment were geared towards entirely different practices from the ones to which we are accustomed, RAAAF offers a reflection on or critique of our current way of doing things – our current form of life. These site-specific interventions are conceived as real-life thinking models that show the potential of an approach that incorporates insights from ecological psychology and the philosophy of affordances in radical interventions and installations that allow for embodied engagement by its visitors and users.

The End of Sitting proposed an alternative vision for the office of the future in which there are no chairs or tables, but that rather consist of a landscape of inclined planes to support different standing and leaning positions, that is, affordances for supported standing or leaning. The art installation accounts for a variety of different body heights and invites people to stand, lean and recline in the context of work, where such physical abilities are not normally used. Now, however, these abilities can be used to take advantage of the affordances provided by this radically different environment. Some of these are deliberately designed possibilities for supported standing, while others are more unorthodox affordances, which can be enacted spontaneously by a person with a relevant skill. In order to arrive at the spatial particularities of this environment, we performed an extensive range of tests and experiments to see which positions actually allow for pleasant ways of working and which parts of the body need support for comfortable leaning or reclining. The aim of the project was to afford positions that are only comfortable for 20 to 60 minutes, instead of the familiar postures that can be used throughout an entire work day. This temporary comfort of individual positions promotes exploration of the landscape of affordances offered by the installation as a whole. By inviting people to assume a variety of working positions, *The End of Sitting* made people aware of the way their bodies normally take certain environmental regularities for granted.

Specialists from the field of human movement sciences observed the behaviour of people who were asked to work in the installation and provide feedback on the design. The subjects of the first empirical study, conducted by Rob Withagen and Simone Caljouw,

reported that, compared to a traditional open-office setting, *The End of Sitting* was more pleasant to work in and better for their well-being.¹⁵ The architectural concept of temporary comfort in a landscape of affordances for various positions clarifies why it was observed that 'many participants worked in several postures and changed location'.¹⁶ The installation managed to motivate people to move more: only 17 per cent of participants worked in just one posture, demonstrating the dynamic of alternation of non-sitting postures we had in mind. The subjects also reported that while their legs were more tired after working in the standing office, they felt more energetic. Furthermore, the study suggests that productivity was on par with more conventional office settings.

The more recent project *Breaking Habits* (2017) follows up on *The End of Sitting* by exploring possibilities for an environment without chairs that might be applicable to a private setting. This experimental domestic landscape of the future that breaks with entrenched living habits is on display at the headquarters of the Mondriaan Fund for Visual Art in Amsterdam. Just like offices and other spaces of our sedentary society, most living rooms are furnished entirely around the possibility of sitting down. *Breaking Habits* explores what a world without chairs and sofas might look like. This art installation turns a philosophical worldview into a tangible, material reality: a diagonal landscape of affordances that provides a scaffold for a more active lifestyle by inviting users to change positions and explore new diagonal standing postures. Using more horizontal (but still diagonal) surfaces and applying a softer material, the affordances provided by this particular installation cater more to the relaxing environment of a dwelling but still omit the sofas and armchairs that have been a part of Western living rooms from time immemorial. Will diagonal living become the new norm?

Conclusion

Insights from ecological psychology have led RAAAF to an understanding of our built environment as part of a dynamic system of ecological niches that accommodates humans and their abilities and practices. The related notion of affordances – possibilities for action offered by the environment – allows us to treat architecture, art and the process of making as an integral element of this system. By using art installations to create new affordances and explore or reveal existing ones, we can offer new approaches for existing practices or even change them for the better.