

Situating the embodied mind in a landscape of *standing* affordances: Living without chairs¹

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Running head: A landscape of standing affordances

Abstract

Sitting too much is unhealthy, but a wide spread habit in our society. Realizing behavioral change in this area is hard. Our society promotes being seated by the way its places are structured: they are filled with chairs. How can we make more healthy environments that invite people to move around more? This Current Opinion piece shows how philosophical research in the area of embodied/enactive cognitive science (Chemero, 2009; Varela, Thompson & Rosch, 1991) let to built vision for the office of the future, of 2025. Multidisciplinary studio RAAAF [Rietveld Architecture-Art-Affordances] and visual artist Barbara Visser built this world without chairs,

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titled *The End of Sitting*. This large rock-like landscape integrates many affordances for standing. Affordances are the possibilities for action provided by the environment (Gibson, 1979; Heft, 2001; Rietveld & Kiverstein, 2014). This landscape of standing affordances allows people to work standing while being supported by the material structure of the environment. This unorthodox experimental working landscape is both an enactive art installation and a platform for research on built environments that naturally invite more active and healthy behavior.

Situating the embodied mind in a landscape of *standing* affordances: Living without chairs

Humans are addicted to sitting. We sit even though we read everyday in the newspapers that “sitting kills” or that “sitting is the new smoking”. We like the comfort of chairs and are living in a sitting society. We sit at the breakfast table, we sit in the car, we sit at the office, we sit at school, and we sit in front of our laptop computers. One scientific study on the sitting epidemic (Van der Ploeg et al., 2012) followed over 220.000 Australians to investigate the relationship between sitting time and all cause mortality. It found that those who sit 11 hours or more per day have a 40% higher risk of dying in the next 3 years than those who sit 4 hours or less. Even when one exercises every day, one does not compensate for the many hours spent seated (For a review and meta-analysis see Biswas et al., 2015).

Why do people typically sit down when they enter a place, say an office? Why do they sit, even though many people already know that sitting too much is unhealthy? People sit because the places in which they spend their lives are *structured around being seated*. In fact, our entire society is structured around sitting: offices, movie theaters, cars, schools and restaurants are filled with chairs. In public transport, in a train, for example, one feels *unlucky* if one cannot sit. In our society we even use standing as a punishment for children, we make them stand in the corner.

How can we make an environment that invites people to alternate physical postures and break the inactivity of sitting? In this current opinion piece I would like to look at an alternative for sitting, taking the perspective of the philosophy of embodied cognitive science (Chemero, 2009; Thompson, 2007; Varela, Thompson & Rosch, 1991), and show how these materialized in reality in a new environment.

One of the main findings of our research on embodied cognition in everyday life and expertise is that it is not explicit thoughts or explicit intentions that drive our skilled actions but affordances (Gibson, 1979; Rietveld, 2008, *Mind*; Bruineberg & Rietveld, 2014). Affordances are the possibilities for action offered to us by the environment (Heft, 2001; Michaels, 2003; Chemero, 2003, 2009; Rietveld & Kiverstein, 2014). The floor affords walking, a cup affords grasping and a chair affords sitting. And moving. And leaning on. So a particular aspect of the environment can offer a multiplicity of possibilities for action.

In recent philosophical work (Rietveld & Kiverstein, 2014, p. 335) we have argued for a more precise definition of affordances as relations between (a.) aspects of the socio-material environment, and (b.) abilities available in a ‘form of life’ (Witgenstein, 1953), which includes socio-cultural practices in our human case (cf. Withagen & Caljouw, under review at *Sports Medicine*, p. 4) This definition suggests that it should be possible to piggyback on peoples’ existing abilities for standing, leaning and hanging to create new affordances for working in all sorts of supported positions.

We distinguish affordances available in a form of life or ecological niche from *relevant affordances* or ‘solicitations’ for a particular individual in a concrete situation (Rietveld, 2008). Solicitations are relevant affordances or invitations for action (Withagen et al., 2012; cf. Dreyfus, 2008). When an individual encounters an affordance that matters to him or her, for example because using it costs almost no energy, it can generate a state of bodily action readiness (Bruineberg & Rietveld, 2014). This solicitation-related bodily readiness is why chairs can suck us in. If we radically change the affordances available in a certain place, we will be able to generate behavioral change. Architects and artists are able to realize such a change of the built environment by creating new affordances.



Image 1: Experimentation. The aim is to find an optimal angle for support of the upper body while standing (cf. the tendency towards an optimal grip in Merleau-Ponty, 1945/2002; Dreyfus, 2008; Bruineberg & Rietveld, 2014). Photo by Barbara Visser.

What would our world look like if we do away with chairs and *standing* becomes the new norm? We, that is multidisciplinary studio RAAAF [Rietveld Architecture-Art-Affordances] and visual artist Barbara Visser, have started experimenting with affordances that support standing in different ways, including supported leaning and hanging. Barbara Visser has a long standing interest in work at the intersection of visual art, architecture and science and is chair of the Society of the Arts, founded by the Royal Netherlands Academy of Art & Sciences (KNAW).

The first space we have tried to re-imagine is the office of the future. The starting point for this project was an invitation by the Chief Government Architect of The Netherlands and the Dutch Ministry of Internal Affairs to develop a vision for the office of 2025. We were surprised to find

out that current plans for the workplace of the future completely ignored the mounting evidence on detrimental health effects of sedentary behavior: all of their plans for the future took desks and chairs as the starting point.

Images 1 and 2 show some of the experiments we did in order to find out what feels good in a world without chairs. The aim of these playful investigations was to discover unconventional affordances that can support us while standing at work.



Image 2: Experimentation to discover unconventional affordances for supported standing. Slanted support for feet is experienced as comfortable when combined with a scaffolded leaning position. Photo: RAAAF. Affective experience is crucial here (cf. Slaby, 2012)

Chairs have been improved thousands and thousands of times, supported standing, however, has long been neglected and is still open for exploration. Our definition of affordances (Rietveld &

Kiverstein, 2014) suggests different ways in which one can discover new affordances for supported standing. One can manipulate or transform material aspects of the environment, finding out what that material can do (Ingold, 2013). In such a process of experimentation we can detect unexpected affordances for supported standing and leaning (Images 1-3). Another way to enrich the landscape of affordances, which we will try out in future research, is by introducing new abilities in the form of life. One way to realize this is by looking in an entirely different form of life for unorthodox abilities that could be used to enrich the landscape of affordances (this kind of importation of an ability from a traditionally different domain is similar to what Sennett (2008) calls a “domain shift”).

These are the first prototypes we built using the results of our experiments (Image 3):



Image 3: The first built prototypes of positions for The End of Sitting. Photo: Maarten Kools

The best positions we discovered come together in this art installation, which is provocatively titled *The End of Sitting* (Image 4). It is a large experimental landscape of standing affordances.



Image 4: The use of two different positions in the End of Sitting landscape. Still from movie The End of Sitting 1:1 by Barbara Visser (camera by Benito Strangio).

Image 4 shows the use of two different positions to work standing. The one on the right is similar to a conventional standing desk, but the one on the left is much smarter. Unlike a traditional standing desk it offers support for one's back and provides tilted support for one's feet. It is comfortable but not too comfortable. While standing in it, the largest muscle group of the body – in the legs – is constantly active. If one is seated, one's large leg muscles are not being used, whereas while standing in the *End of Sitting* one's legs will get tired after about 30 minutes or an hour, and the person will switch to one of the many other positions in the landscape.

Perhaps she will be lying down a bit, or hanging with one's arms over the horizontal black "ropes" that support the upper body (see images 4-7).



Image 5: The End of Sitting. Photo by Jan Kempenaers

It is this dynamic of alternation that avoids that one will stay in the same position all day, which would be unhealthy as well. To evoke this alternation we built an entire *landscape* of affordances with many different positions.

From feedback by ecological psychologist Rob Withagen and human movement scientist Simone Caljouw (Jongeneel, Withagen & Caljouw, 2014) on an earlier RAAAF-project that aimed to invite children to move by means of alluring affordances for climbing, we had learned that one way to generate locomotion was by offering a large variety of affordances. The advantage of this variety in affordances offered is that people with different abilities and body sizes would be optimally supported by the material structure. In the End of Sitting, this variety of affordances

was realized by making a landscape that gradually increases in size. For many of the positions both tall and short people would be able to easily find several soliciting spots somewhere on the rock of standing affordances.

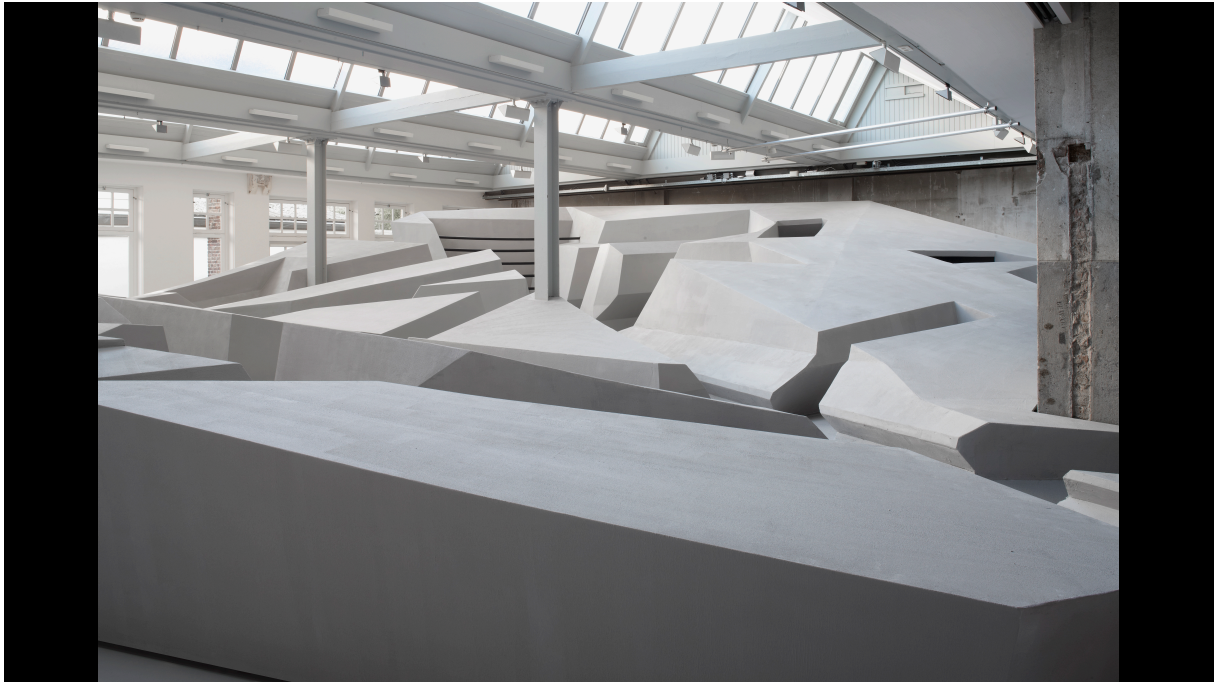


Image 6: The End of Sitting sculpture. Photo: Jan Kempenaers.

Images 5 and 6 show the entire sculpture as it was built in November 2014. This will not be the final version of the End of Sitting landscape. This is just the start of a long experimental trial phase up to 2025. We will continue experimenting and make it more inclusive for elderly, blind people and people with other disabilities over time. Empirical research by the Rob Withagen and Simone Caljouw of the University of Groningen investigates how people use and experience this landscape. Some of the research questions in that study were: Do the subjects become more energetic? What does working in the landscape mean for their wellbeing?



Image 7: The End of Sitting. Photo: Jan Kempenaers

This kind of empirical research is crucial for improving the landscape. In fact this project integrates insights from several disciplines to bridge the gap between science and practice: visual art, architecture, empirical science (human movement sciences and ecological psychology) and philosophy (Images 8-9). Within the field of philosophy *The End of Sitting* is special in that it presents a philosophical worldview, however not in words, as philosophers typically do, but in the form of an enactive art installation. Rather than arguing for the claim that people are embodied minds situated in a landscape of affordances, this sculpture allows people to experience that physically in a landscape of *standing* affordances that gets them out of their comfort zone and confronts them with new possibilities for action to explore.

The End of Sitting is a platform for scientific research on the office of the future. The subjects of the first empirical study reported that, compared to a traditional open office setting, the *End of Sitting* landscape was more pleasant to work in and better for their well being (Withagen &

Caljouw, under review for this special issue of *Sports Medicine*). For RAAAF | Barbara Visser these were important and encouraging findings. Moreover, the fact that only 17% of participants worked in just one posture, shows that most participants did indeed change, manifesting the dynamic of alternation of non-sitting postures we had aimed for. In addition, the subjects reported that their legs were more tired after working in the standing offices, but that they felt more energetic after working in the new work landscape. Furthermore, the empirical study by Withagen & Caljouw (under review for this special issue) suggests that productivity in the End of Sitting was as good as in the conventional office setting, but more research is needed to settle this matter. In sum, according to Withagen en Caljouw, The End of Sitting “naturally invites movement” (p. 11) and “arguably promotes more healthy behavior” (p. 10). One of the most important open question for future research on its health effects is what standing in this experimental working landscape means for metabolism of blood sugar and fat, as compared to sitting.



Image 8: The End of Sitting detail. Photo: Ricky Rijkenberg

Making people aware of the fact that affordances drive our everyday behavior, increases the chances that they start changing the material structure of the different places in which they spend their lives; replacing affordances that trigger unwanted, unhealthy or counterproductive activities with *new* ones. Replacing old affordances with new ones provides a way of thinking about scaffolding change in other domains of society as well. Discovering unorthodox affordances that can change our socio-cultural practices *is creativity* in action (Rietveld, 2015; Rietveld et al., 2014). Using this kind of discovery we can make the transition from our sitting society to a more active and healthy society.

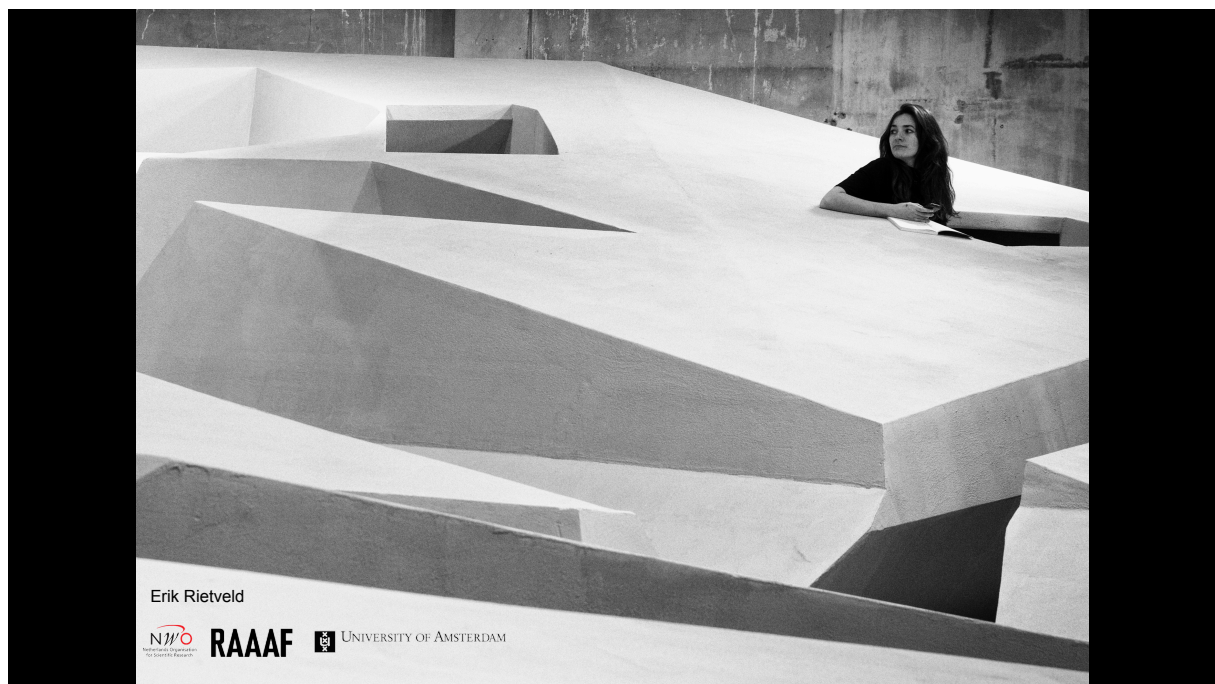


Image 9: The End of Sitting detail. Photo: Ricky Rijkenberg

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Art installation The End of Sitting by RAAAF | Barbara Visser in collaboration with Looiersgracht 60.

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