Undesign and understanding

understanding

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Introduction

At a recent corporate presentation, Volvo introduced an app that allows the customers to share the «car keys» with a swipe on their mobile phones as their latest innovation in vehicle design.[1] This may be seen as an ingenious innovation to solve some pressing problems of their customers, or as an unnecessary gadget. While it may solve some problems, the question is whether these are the most pressing problems of vehicle design and would thus qualify as an innovation in this area.

John Thackera describes his response to the focus on gadgety technical innovation in vehicle design as diminished amazement, which is not necessarily a matter of technical functionality but of an appropriate technological response to the problems of vehicle design (Thackara 2006: 187). Do these technical features really solve the problem at hand? Are the features built into these vehicles – including their development and the network of things supporting them – appropriate for improving the problem of mobility and transportation? Are cars even a solution to the problem of transportation and mobility or are they actually counterproductive objects? Do not vehicles themselves create problems of available space in cities? Do cars create more possibilities for human experience or do they limit possible experiences? How should designers respond to the challenge of improving a design object?

In this chapter, the concept of «undesign» is used to investigate some of the ideologies of design that may be limiting to design – for example, viewing design as a problem-solving activity or the tendency to see issues in the world as design problems that can be solved by adding design.

Professional deformation

Like any body of knowledge, design is prone to see the world in terms of problems that can be solved or approached with the mechanisms of that very discipline. For economists, problems are economic problems; for lawmakers, problems are legal problems; and for designers, problems are design problems. In this respect, bodies of knowledge often have a biased or conditioned view of the world. This view may be unavoidable and is a consequence of professional deformation (*Déformation professionnelle*) through education and is thus built into the foundation of the respective body of knowledge (see Merton 1968: 252). On the one hand, this deformation or conditioning may be a good process as the respective approaches are studied in great depth; on the other hand, this may be problematic when these views become

ideologies and one is unable to have alternative perspectives on the world.

Additional to the deformed view of the world, the accessible technology may add to the narrowing of the perspective, as it influences how an issue surfaces as a problem and determines what options are available for responding to that problem. In other words, problems often show up in terms of the available tools.

This principle is also known as the «law of the instrument» articulated by Abraham Kaplan. It describes a cognitive bias that leads to an overreliance on a specific tool or technology. This diminishes creativity in solving problems by relying on the approaches, methods, tools and technologies that one is already familiar with. Kaplan argues that «we tend to formulate our problems in such a way as to make it seem that the solutions to those problems demand precisely what we already happen to have at hand» (Kaplan 1964: 303). Abraham Maslow furthermore observes that it may be «tempting, if the only tool you have is a hammer, to treat everything as if it were a nail» (Maslow 1966: 15). For Maslow, this, too, has implications for how problems show up for someone. A problem-centred approach lets one figure out what the problem actually is and how best to approach it. A method-centred approach leads one to stick to the techniques that one knows and is able to use well. Silvan Tomkins additionally observes the primacy of tools and methods in thinking, as there is a

> tendency of jobs to be adapted to tools, rather than adapting tools to jobs. If one has a hammer one tends to look for nails, and if one has a computer with a storage capacity, but no feelings, one is more likely to concern oneself with remembering and with problem solving than with loving and hating. (Tomkins 1995: 445)

One tends to approach problems through the currently available technology or, worse, to create problems to which the currently available technology is a good solution.

Designers look at the world from the perspective of design. For design, issues in the world are understood as design problems that can be solved with design; and design is often understood in a very narrow way as imposing order (Papanek 2006: 4). Donald Norman, for example, highlights the urge of designers to simplify seemingly messy forms of interaction. In air traffic control, for instance, the communication channel between the tower and the approaching airplanes is open to all the approaching airplanes. This creates a lot of chatter in the communication that may seem irrelevant to the individual approaching pilot. A designer may thus conclude that it would be better to restrict the communication of a pilot with the tower to the exchange of information that is relevant for the individual airplane only. This would make the

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2   Appropriate is understood as people-centred as opposed to technology-centred design. It is furthermore a matter of simplicity, small-ness, robustness and enoughness. It is not an argument against technological develop-ment or the application of high technology solutions. It is rather an argument for a more reflected use of technology to achieve a cer-tain result with as little means (time, energy, resources, support networks) as possible (see Schumacher 2011).

communication more organized, but would reduce safety as it would limit the situational awareness of the pilots, which requires them to listen in on all the other conversations. This is also the reason why the control rooms of industrial plants are large and often equipped with toggle or push-button switches. This creates a situational awareness of what other people are doing. If someone switches a switch this can be observed by others spatially, which again adds to the overall safety of the system. They can also see the switch being switched. Designers, however, may perceive this situation as problematic and attempt to organize the control rooms better by making the controls smaller, adding soft buttons or limiting the focus of each operator only to the tasks that they are concerned with (Norman 1994: 139–146).

There are dangers in simplifying, reducing and ordering if one approaches the situation with a biased view and does not understand the requirements of the situations and the implications of the design decisions fully. In some cases, it would be better to leave the things as they are, or to employ an older technology that may actually produce better and more robust results. Technology should be used according to what is appropriate to a situation, in terms of both resources and social conventions, rather than in terms of what is possible.[2]

This may be difficult as one of the defining features of design seems to be that it produces change and new things. But can the out-come of a design process also be the decision not to change anything or not to produce something new where this may seem appropriate? Can the decision «not to design» be seen as a design decision and thus non-design as design?

Within the context of designing human–computer interactions, Eric Baumer and Six Silberman argue that a design process may lead to the conclusion that the implication may be not to design anything; and that the implication not to design should be valued in design. Aiming to develop a more reflective awareness for specific design situations and to allow one to see that design decisions may be inappropriate or even harmful, they encourage designers to ask three questions when designing. First, «could the technology be replaced by an equally via-ble low-tech or non-technological approach to the situation?» (Baumer / Silbermann 2011: 2271). Many problems to which computational tech-nology may seem to be a solution have been addressed before with a different technology. While a mobile phone may be used for quickly writing up grocery lists, pencil and paper are just as effective in most instances. So the question is, which system is more appropriate to the

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problem. Second, «does a technological intervention result in more trouble or harm than the situation it's meant to address?» (Baumer / Silbermann 2011: 2272). While designers see opportunities to deploy computational solutions everywhere, the question is whether these may turn out to be counterproductive to the problems that they aim to address. Using mobile phone applications, for example, to promote more ecologically sustainable behaviour may be questionable, since the production, use and disposal of these devices themselves is ecologically problematic. Third, «does a technology solve a computationally tractable transformation of a problem rather than the problem itself?» (Baumer / Silbermann 2011: 2272). The project One Laptop Per Child, for example, has reduced education to a problem that can be addressed through the accessibility of computers. While computers may be helpful for education, education is not equivalent to using computers and is thus not a problem that can be solved with computers. The results of studies investigating the project thus showed that the areas of educational improvement were «cognitive skills and competences related to computer use» (Cristia et al. 2012: 20; cf. Ames 2019). For Baumer and Silberman, part of design is thus also to articulate the value of absence and not to design.

More often than not, design is concerned with adding features to things rather than simplifying things, as in the case of air traffic communication or control room design. Adding safety features, for example, is often regarded as appropriate to make an overall system safer – and, of course, this is often the case. However, adding more features does not automatically increase the safety of the entire system.

A case where increased safety features actually turned out to be a disaster is Germanwings flight 9525. In 2015 the airplane on that flight crashed into a mountain. First it was unclear what had happened but it slowly became clear that the co-pilot has steered the plane deliberately into the mountain. After the captain left the cockpit to visit the toilet, the co-pilot locked the reinforced safety door, a safety feature that was installed in all commercial airplanes after 2001 to prevent hijacking. Although the captain had a code for opening the door from the outside, the code panel could be disabled from inside the cockpit for at least five minutes, leaving no option for opening the door in time and preventing the crash from happening (Henley 2015; Hammer 2016). Installed as a safety feature, the door became a trap for the captain, the cabin crew and the passengers. Was the cause of the accident too much design, too little design or inappropriate design?

One may consider several causes for the crash: *Human error*, such as the captain trusting the co-pilot and leaving him alone in the cockpit or not checking the psychological ability of the co-pilot. *The environment*, such as people needing airplanes for transport.

The design of the system, such as reinforced doors that can be locked and prevent authorized people from re-entering the cockpit. *The procedures used,* such as weak psychological screening of pilots or no requirement for two people in the cockpit at all times (see Perrow 1999: 7). Of course there is no single cause for the crash, but it nevertheless shows how added safety features can become a threat. What other options are available for preventing the hijacking of airplanes apart from doors? Airplanes flown entirely by auto-pilots? Pilots carrying weapons? Passengers having military training? Armed law enforcement officers escorting the flight? Stronger background screening of all passengers? No added features? What would be an appropriate design approach to the problem? What exactly is the problem and is this a design problem or rather a social problem?

For designers, the imperative is often to find an issue in the world, turn it into a design problem and provide a design solution. The concept of undesign may provide a conceptual framework to overcome the professional deformation of seeing issues in the world as design problems.

Limited and extended possibilities

Any new design object opens up new possibilities and experiences and at the same time limits the possible experiences to those made possible by the design object. Through the design of a particular artefact a limited set of possibilities of doing things is fixed while other possibilities of doing things are somewhat undesigned through the design of that very solution. In some way, design objects both open new possibilities and at the same time limit possibilities of doing things differently. Design not only produces new possibilities, it also creates new conformities. Undesigning can thus be understood as opening up possibilities.

This, for example, becomes visible in the demise of public transport in the United States. Until the 1950s many cities had public transport systems in the form of streetcars, which were increasingly replaced by individual modes of transport in the form of cars. The demise and eventual elimination of this mode of transport was a combination of unprofitable businesses, interests of car manufacturers as owners of many streetcar companies and change in transport demands. Some lines were replaced by buses; the majority, however, were replaced by individual auto-mobility. Of course, cars made new ways of doing things possible, such as suburban living or strip-mall shopping. At the same time, the primacy of cars made other things increasingly difficult or even impossible, such as using public transport, not owning a car, using a bicycle or walking. The proliferation of cars often leads to the demise of the infrastructure for public transport. Particularly in the case of street cars, it is furthermore difficult to reinstate this system of

transport once the infrastructure is gone, as the required space for tracks and the rail network may have been repurposed for the use of car lanes or parking lots. Once the infrastructural system is eliminated, the supporting infrastructure is eliminated as well. While the use of cars is possible (supposing that the economic conditions make this option possible), the use of public transport is often not an available option and thus impossible (Greene 2004; Norton 2008).

The phenomenon of extending and limiting options has been described by Ivan Illich as radical monopoly, which, for him, is the dominance of one product far beyond what is usually understood as monopoly. For Illich, cars can create a radical monopoly for traffic, as «they can shape a city into their image – practically ruling out locomotion on foot or by bicycle» (Illich 1975: 66). In other words, «radical monopoly imposes compulsory consumption and thereby restricts personal autonomy. It constitutes a special kind of social control because it is enforced by means of the imposed consumption of a standard product that only large institutions can provide» (Illich 1975: 67). For Illich, radical monopoly is not only a matter of lack of alternatives, it is also a matter of how the products and tools we use may limit or even subvert the range of possibilities to engage with the world by being over-efficient. For him, over-efficient tools can also create radical monopoly as they «can upset the relationship between what people need to do by themselves and what they need to obtain ready-made» (Illich 1975: 65).

Once a system reaches a radical monopoly, such as the car for transport, it may be difficult to break that monopoly by only providing alternatives. The transport system «car» consists not only of the individual vehicles but also of the infrastructure supporting the car and the living arrangements made possible by the car (McLuhan 2001: 8–9). Since these infrastructures and arrangements are in place and cannot easily be abandoned, the discussion about ecologically better forms of transport is often reduced to the improvement of cars in terms of their ecological footprint rather than in terms of radical alternatives to problems of transport and mobility.

As Tony Fry argues, it may not be enough to replace existing objects with more ecologically friendly objects but to eliminate the unsustainable altogether (Fry 2005: 145–147). While he is a bit vague on what this would actually imply and despite the fact that elimination may have a totalitarian connotation in terms of possible degrees of freedom, the idea of elimination and thus intended impossibilization is quite interesting in this context. If one way of doing something becomes impossible (perhaps a resource or procedure), different ways of doing things will have to be employed or invented. This may be actively designed, not for the sake of making the world less comfortable, but as an incentive for coming up with new ways of doing things.

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Perhaps it may already be helpful to actually see ways in which the design of one thing impossibilizes the existence of other things. This may be what the Situationists had in mind when they sprayed the slogan «Under the Pavement Lies the Beach» («*Sous les pavés, la plage*») on the walls in Paris in 1968, indicating that a different reality is possible (Wark 2011). Of course, there is no actual beach under the pavement, but the slogan nevertheless asks one to consider the possibility of a beach instead of the street and thus invites one to reflect on how this would change the constitution of city life. While streets render one condition of life possible, beaches would render a different one possible and both render each other as impossible. Pavement is often seen as the natural environment of a city and opening the pavement (even if only conceptually) opens up new possibilities for living in cities. Of course, one can also take the slogan as an inspiration for actually opening up and removing pavement, and replacing it with community gardens, as the organization Depave promotes (see Thackara 2015: 54–55; Litman 2011: 38–46).

A danger of functional and efficient approaches to design may also be that it often produces sterile environments that limit the amount of possible experiences, a phenomenon that Matthew Crawford calls «the flattening.» He distinguishes between an open environment where the world and its problems and demands are apparent, and a designed environment that aims to remove the world and its problems and demands. He elaborates this based on a personal experience of visiting a gym that played predetermined and commonly appealing music. He did not like the music and asked the desk clerk whether he could play some different music. This was not possible as the clerk was not at liberty to do so. This experience contrasted sharply with the experience he had in his youth with gyms. There, the dominant group was playing their preferred music on a stereo. If one wanted to change the music, one would have to engage with that group and, if one was convincing, they would do so. The predetermined playlist eliminates this possibility as well as engagement, argumentation and negotiation. This total and predetermined environment eliminates individual freedom and possibilities of expression (Crawford 2015: 181–183).

This is similar to what Illich describes as industrial tools as opposed to convivial tools – using the term «tool» very broadly. Whereas industrial tools «allow their designers to determine the meaning and expectations of others,» convivial tools «give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision» (Illich 1975: 34). For Illich, most tools are not convivial as they work with the user rather than for them. Such tools would be least controlled by others and allow the highest degree of autonomy. As such, they would have to be relatively small in scale as «the growth of

tools beyond a certain point increases regimentation, dependence, exploitation, and impotence» (Illich 1975: 34).

Undesigning along these lines may be conceived as opening up new possibilities and deconstructing the objects that hinder these alternative possibilities. It would necessitate a state in which no order is imposed to allow these new possibilities to emerge. It is thus also a critique of designing tools, technologies and environments that aim to guide human behaviour.

A critique of design

Undesigning can also be considered as a critique of design – as a critique of the solution to problems produced by professional designers. These are often narrow in scope and solutions to the problems of design rather than real-world issues.

Victor Papanek, for example, criticizes not only a particular field of design but «Design» altogether, as it seems to be interested in preserving a system of thought rather than addressing real issues. Designers are interested in producing objects for a type of society that they deem desirable. They thus design within the realm of what is needed, desired and possible for them rather than for others.

Papanek illustrates this vividly with an anecdote of a presentation of his Tin Can Radio at the Hochschule für Gestaltung Ulm, the former high castle of modernist design, in 1967. Upon presenting his radio, which was built using locally and readily available materials, the audience expressed their concerns about the inferior aesthetic appearance of the object. This was not according to their design standards although it worked and was possible to be built within a local community without the need for designers (at least in the sense of the audience). Their suggestion on how to improve the radio was to paint it grey (Papanek 2006: 227).

This highlights the dichotomy between the problems of designers and the problems of the users in the real world. In this sense, Papanek tried to undesign the professional and institutionalized form of design, which claims to have a more enlightened view on how to solve problems. Their design decisions are often not necessarily based on what people actually do and want, but rather on what they themselves want and thus prescribe what is good design and a good society.

Undesign may furthermore contradict the desire to make an ideal (or idealized) product as it highlights the limitation of knowing others. Martin Brigham and Lucas Introna have articulated this problem based on Emmanuel Levinas' perspective on the relationship between the Self and the Other. They highlight both the difference between «need» and «desire» and the difference between «saying» and «the said»

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within Levinas' ethical philosophy. For Levinas, need focuses on the Self and the fulfilment of egocentric wants. Need is instrumental and aims to produce control, categories and order. Desire, on the other hand, is about the Other, whose interests, needs and desires the Self can never fully know. Levinas contrasts this with the difference between «saying» and «the said.» Whereas «saying» refers to the active communication between the Self and the Other, «the said» refers to the remains of a communication that has been ordered and categorized by the Self. «The said» puts a primacy on the language and content of the speaker's communication and how reality is represented to the Self through categorization and labelling. «Saying» is fluid, active and open and exposes the Self to the Other in the conversation. For Brigham and Introna, similar to the way «unsaying the said» would open a communicative process between the Self and the Other and reveal what is hidden in «the said,» «undesigning the design» would open the design process and reveal what is made invisible by design (Brigham/Introna 2007: 1–10; cf. van der Velden 2010: 117–123). Designing could thus be understood as an open communication process, in which there is no need to impose order in the form of design objects as solutions to problems. When designers (Selves) interpret the desire of users (Others) as need, they limit the scope of articulating desire as any design object is just one possible form of articulating that desire. The focus on designing rather than design objects would emphasize articulating possibilities instead of implementing order. If designers would focus more on saying/designing rather than on what has been said/designed, they may also focus more on changing themselves in this process before they attempt to change the world. Here, undesigning could be regarded as a form of design articulation.

The prescriptive views of designers are, however, very noticeable, for example, in advertisements for the design of domestic or office interior where people are conspicuously absent. A recent advertisement by a Swiss kitchen and bath manufacturer, for example, shows their quite conventional cubic products in people-free and standard domestic arrangements but placed in odd environments, such as the surface of the moon or on a meadow with a cow drinking from the bathtub (see Figs. 15.1–2). The images furthermore suggest that the walls of the houses in which these objects would be placed are still missing.Though these images aim to humorously advertise the products, they also highlight the focus of the designers on the form of these objects rather than their real-world use or their potential dialogue with the environment. After all, how would these objects change if the designers had taken the environmental conditions seriously? What would a bathroom on the moon look like and what kind of interesting experiences could it provide? How would the bathing experience change if the bathtub was
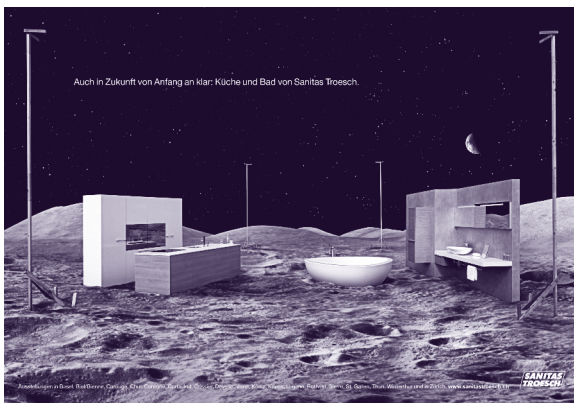
Fig. 15.1 Sanitas Troesch, Moon, 2014.
Advertisement by Ruf Lanz.

Fig. 15.2 Sanitas Troesch, Lake and Cow, 2014.
Advertisement by Ruf Lanz.

literally standing on the meadow and cows were taking a drink while someone was bathing?

Furthermore, the question is whether these objects actually fulfil the desire of their users or if those adapt to the logic of these objects. Are designers designing bathrooms for bathing or kitchens for cooking that actually create desirable experiences or are they repeating conventions (see Aicher 1982)? The relationship between actual activities and the thoughts that designers have about these activities has also been explored and articulated by Leonard Koren. He investigates the idea of undesigning the bath both argumentatively and through photographic exploration that searches for less conventional and more interesting bathing experiences. These experiences do not necessarily require a designed environment of predetermined functionality, but can incorporate communal, natural, uncontrolled and perhaps even wild elements into the bathing experience, thus making it more spiritually rewarding (Koren 1996: 10–13).

The difference between the needs imagined by designers and real human needs has also been described by Tony Dunne and Fiona Raby through their conceptions of «critical design» and «design noir.» For them, «beneath the glossy surface of official design lurks a dark and strange world driven by real human needs» (Dunne/Raby 2001: 6). This world, however, can never be fully addressed by design, but design can take inspiration from this world of unofficial design and develop new approaches that may address more complex human needs and desires. For them, design objects could create existential moments and thus «would not help people to adapt to existing social, cultural or political values. Instead, the product would force a decision onto the user, revealing how limited choices are usually hard-wired into products for us» (Dunne/Raby 2001: 46). In some sense, these objects would

reveal the limitations of human experience and make them visible and thus undesign design.

A critique of design is often criticizing the conceptual limitations of design understood as problem solving. It thus shows that a less imposing approach to design could lead to a greater variety of experiences through objects that are open and grounded in the messy reality of human life.

Design as inquiry

Undesign as a concept may also be useful to disengage design from the production of useful objects and to understand design as a form of inquiry. Design objects can thus be understood not as solutions to problems but as media for articulating issues in the world. The aim of design as inquiry is thus not to change the world but to understand it (cf. Marx 2000). Since the aim is not to solve problems but to problematize the world, design may even be understood as a form of philosophical inquiry (Franke 2016).

A project that exemplifies such an approach is *The Toaster Project* by Thomas Thwaites (see Figs. 15.3–4). In some sense, following the philosophical experiment by David Henry Thoreau, who wanted to live on what he could make himself with his own hands, Thwaites attempted to build an equivalent to an industrially produced toaster from scratch over the course of nine months. Conventionally, one would buy a toaster, walk home and make toast without giving it much thought. What may seem to be an impossible and perhaps even silly task – as it seems to be clear from the outset that this is impossible to do – is actually a pungent philosophical investigation into the condition of contemporary industrial society.

Fig. 15.3 Thomas Thwaites, The Toaster Project, 2009. Photo by Daniel Alexander.

Fig. 15.4 Thomas Thwaites, The Toaster Project, 2009. Photo by Nick Ballon.

Thwaites starts the project with opening a cheap industrially produced toaster. He then analyses the components and working principles and sets out to acquire the raw materials, of which the components are made, by himself. Afterwards,
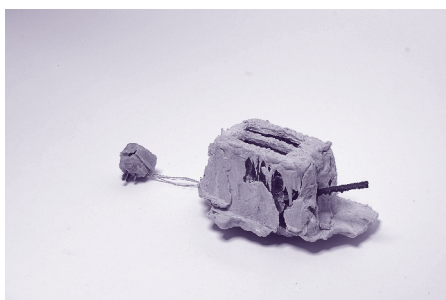
he tries to transform these raw materials into the components for a toaster. Ultimately, he fails in building a working toaster, but this was also not the primary aim of the project (Thwaites 2011). Rather, the project aimed to uncover the various layers of knowledge that the manufacturing process of industrial goods involve. These industrial objects are essentially black boxes and when they are opened a whole network of people, services, skills, materials, connections, forms of knowledge and problems emerge that constitute a toaster (see Latour 1999: 183–185).

The first-hand experience of failing to build a quite simple industrial object furthermore shows the limitations of individual knowledge and understanding as well as the impossibility of building almost anything by oneself. Thwaites undesigns the design and reveals the infrastructural and economic conditions of the production of industrial goods and asks what the «real» costs of a toaster are.

Another project that highlights the dialogical condition of design in understanding the Other is *paraSITE* by Michael Rakowitz (see Fig. 15.5). In this project he takes an investigative approach to the living conditions of homeless people through the medium of design. In individual conversations with homeless people in Boston, Cambridge and New York City, Rakowitz discusses their requirements for shelter, which he then builds as inflatable structures from cheap and readily available material such as plastic bags and tape. These shelters are portable and can be attached like parasites to the warm air outlets of the heating, ventilation and air-conditioning system of buildings. The air then both inflates and heats the structure.

Fig. 15.5 Michael Rakowitz, paraSITE, shelter for Joe H., 1998.

The project does not aim to provide a solution – in the form of a design object or product – to the living situations of homeless people. Rather, the design objects serve as media for discussion and investigation. Each shelter is custom-made and the design process for each shelter begins with a conversation between Rakowitz and the occupant. Rakowitz develops the individual shelter together with the individual homeless person in order to understand their individual desires and needs.

Some requirements were unexpected and included, for example, making the shelter somewhat transparent so that the occupant could see potential attackers. Another requirement was to add a tube that could be run down a gutter so that the occupant could pee without leaving the shelter – thereby essentially adding a bathroom to the unit. Often the requirements also touched on laws affecting the homeless.

In New York City, for example, one occupant wanted the shelter to respond to a local anti-tent law, which states that any structure of 3.5 feet or taller that is set up on city property has to be considered as an illegal encampment. The requirement thus became to construct a shelter below the maximum height, which resulted in a sleeping-bag-like structure. Whenever the occupant was questioned by the police the occupant argued that the shelter was not a tent and had the police measure the height (Rakowitz 2003).

Through dialogue with the occupants Rakowitz investigates their lifeworlds, and by involving them in the design process the design objects emerge from the requirements of those worlds rather than imposing solutions according to abstract design principles. The project provides shelter to individual homeless people, makes their world visible and reveals wasted resources, such as hot air or the influence of building laws on the possible shape of these structures.

A further project that radically questions the validity of generally accepted approaches to design is *A Measurable Factor Sets the Conditions of its Operation* by Marloes ten Bhömer. The project aims to challenge the typologies of fashion-oriented approaches to the design of high-heeled shoes by employing an engineering approach to the problem of supporting the high-heeled foot while in motion. Conventional approaches to the problem often produce impractical results, clichés and restrictive roles to which the women wearing the shoes have to conform (Bhömer 2019: 5).

Fig 15.6 Marloes ten Bhömer, Bluepanelshoe, 2015.
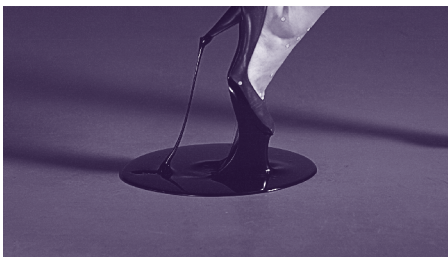
Fig 15.7 Marloes ten Bhömer, Material Compulsion, 2013.

Starting with studying the anatomy and biomechanical factor of the foot and ankle led ten Bhömer to realize that the high-heeled shoe would require a radical new design approach in order to be able to serve as a working support structure. From the analysis, she deducted a set of parameters that she could then address as a structural engineering problem. This resulted in a variety of different hypotheses, design proposals and prototypes for high-heeled shoes with a more appropriate supporting structure for walking, such as the *Bluepanelshoe* (see Fig. 15.6).

Ten Bhömer furthermore analysed the role high-heeled shoes play as objects in society and particularly as plot devices in movies. In collaboration with Noam Toran she produced *Women in Various States*, a collection of cinematic moments in which women's mobility is undermined by their wearing

high-heeled shoes. The collection shows scenes of women slipping, tripping, sinking or tumbling on ground like sand, grass or mud. This analysis led ten Bhömer to recreate some of these scenes in *Material Compulsion* (see Fig. 15.7), a slow-motion film in which she uses high-heeled shoes to walk through substrates like oil films, baked beans or a rubber block. The question then becomes: how would a shoe need to be constructed to allow a better support in these situations?

The project shows novel design opportunities that are often difficult to see by taking a radically different approach to design questions. Here it seems that ten Bhömer had to undesign the high-heeled shoe in order to see this different approach. The resulting shoes thus question the conventional design of these shoes and the seemingly fixed societal roles that these objects attribute to their wearers.

All three projects highlight how design can be understood as a form of inquiry that investigates issues rather than solves problems. These forms of inquiry undesign design, as they open the black boxes of industrial production, aim to understand the Other or question the form, function and logic of design objects. They produce a cultural understanding in the form of design objects which allow the audience to gain a new perspective on these issues.

Conclusion

This chapter has used the concept «undesign» in order to explore issues such as the professional deformation and biased views of designers, the intentional or unintentional limitation or expansion of experiences through design objects, the critique of professional design, and the use of design objects as media for inquiry that can facilitate different forms of understanding.

The aim was to articulate the problems of understanding design as problem solving and of design as solving problems by adding solutions to the world in the form of design objects. The concept of «undesign» may allow one to conceive design differently. It may open up avenues for design as a form of articulation and critique, design as a way to remove rather than add objects to the world, design as not designing where it may seem inappropriate, or design as leaving things unfinished.

Design objects are thereby conceived as media – or as a means rather than ends – that are used as a vehicle to engage with issues in the world through designing. The aim is furthermore not necessarily to provide solutions or to give answers, but to show new perspectives on the world through design objects whereby design may be understood as a form of philosophical inquiry.

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