

# Part II

## Proposed approach

Part II, consisting of the Chapters 5 and 6, presents the main results of the research and consists of an explanation of the proposed practice-oriented design approach. The approach is divided into a model for taking practices as a unit of analysis (Chapter 5) and a model for taking practices as a unit of design (Chapter 6). Methods for analysis aim to gain understanding of existing practices in order to inform and inspire design and find opportunities for change. Methods for design aim to generate possible less resource intensive reconfigurations of practices.

It is important to explain that the order of presenting the proposed approach before the empirical projects is not chronological. Rather, the recommended approach and models were developed through and emerged from reflection on the empirical projects underlying Part III. The reason for positioning the empirical chapters after the methodological ones is because in this thesis, materials from the empirical projects are used to illustrate how the proposed approach could work.

The resulting recommendations are specifically targeted at (product) designers embarking on a sustainable design project and meant to offer useful guidance for those interested in, but (relatively) unfamiliar with practice-oriented design. The recommendations contain a considerable amount of detail. This level of detail is meant to bring across as much of the insights – gained from several years of experience through and careful reflection on the empirical projects – as possible. It does not mean, however that the proposed approach has to be conducted exactly as described. In practice theoretic terms, the description represents a possible performance of practice-oriented design that intends to invite a wide variety of subsequent performances.



# 5 Practices as a unit of analysis

## 5.1 Introduction

Chapters 1 to 4 have outlined the (prescriptive) knowledge gaps that lie at the touching points of practice theory and sustainable design. After first exploring the basic implications of taking a practice-oriented approach, this chapter goes deeper into the topic of taking practices, instead of interactions, as a *unit of analysis* in sustainable design. As explained in Chapter 4, other authors have addressed this topic, but they have mostly limited themselves to analysing situated practice. Those who have executed elaborate forms of analyses by tracing practices over space and time have done so in various, but so far only context specific ways. Building on this earlier work, the current chapter proposes a more generalised approach to analysing practices for sustainable design.

The chapter starts with a slight elaboration of the conceptual framework offered by practice theory that was found to be important for integration of the theory in a design context. The core of the chapter, formed by Section 5.3, is a description of the proposed practice-oriented analytic approach, which consists of four related steps for taking practices as a unit of analysis. Partly, these steps make use of existing literature to obtain their data, but this needs to be supplemented with empirical data. Because there are many similarities between the challenges and ways of gathering this empirical data several steps, the chapter brings them together in a separate section on gathering empirical data when analysing practices in the context of sustainable design.

## 5.2 Practice theory enhanced for design

Practice-oriented designers study practices. As explained in Chapter 3, a practice (as entity and as performance) consists of the elements images, skills and stuff and their links. When studying practices, the aim is to get an overview of these elements and the ways in which they relate. In other words, studying practices means fleshing out the model in Figure 5-1.

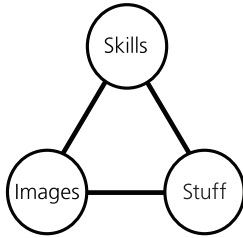


Figure 5-1 A practice that has not been analysed.

Through experiences in specific projects, it became clear that the existing conceptual framework offered by practice theory, as presented in Chapter 3, did not always offer the footing required for the development of a practice-oriented design approach. Therefore, a slight adjustment is proposed, which nonetheless builds on existing literature.

### 5.2.1 Practices as groupings of elements and multitudes of links

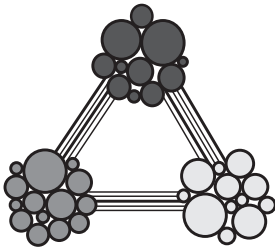


Figure 5-2 A practice as a constellation of groupings of elements, interconnected through a multitude of links.

Zooming in on the practice as a constellation of elements: images, skills and stuff that are linked together, this thesis introduces an adjustment of the model used by Shove and Pantzar (2005) by visualising the elements as *groupings of elements* and the links as a *multitude of links* (Figure 5-2). This adjustment is useful for several reasons.

### 5.2.2 Performances as partial manifestations of entities

First, it helps to clarify the important distinction between practice-as-entity and practice-as-performance. When analysing practices, it is possible to study one particular performance and describe it in terms of the images-skills-stuff model. However, a single performance is only one manifestation of a practice-as-entity. The entity contains many other varieties of performances. For example, taking a shower after sports, or before a date are both normal forms of showering, just like turning up the thermostat or putting on a jumper are widely occurring ways of staying warm at home. However, although they are manifestations of the same practice, each performance integrates a different set of

elements. All these elements and their links *together* form the practice-as-entity. So for example, although rarely deployed in the same performance, images of refreshment and of getting warm are both part of the practice of showering. Figure 5-3 illustrates this distinction between entity and performance using the refined images-skills-stuff model.

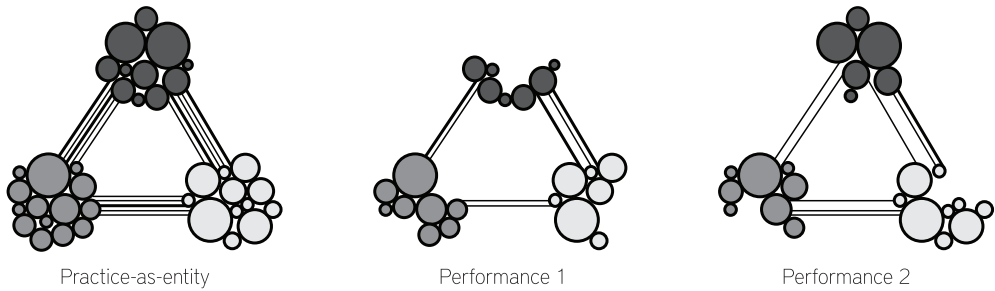


Figure 5-3 The practice-as-entity contains all elements and links that occur in the variety of performances it organises (note: it is usually more than two performances that make up an entity).

### 5.2.3 More and less essential elements and links

Second, what this form of visualisation also highlights is that some elements and links can be viewed as more core or essential to the practice than others, namely, when they occur in many or all performances (Figure 5-4). For example, bathing practices always involve water, and practices of thermal comfort, at least in the Netherlands, generally involve space heating. Similarly, some links may be stronger than others. Links that are made in a similar way by all practitioners may be more difficult to break than links that are more ambiguous. For example, the link between a bath and relaxation is often made, while the link between jumping up and down and getting warm was made only once, by a little girl in the staying warm projects.

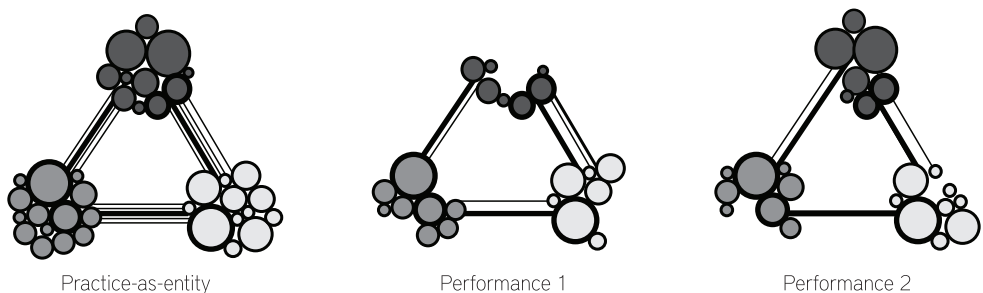


Figure 5-4 More and less essential elements/more and less strong links (adjust figure of entity).

## 5.2.4 On accessing the practice-as-entity

Finally, it is important to realise when studying practices that the practice-as-entity, which is the object of study, can only be studied indirectly. As explained above, the practice-as-entity only partly manifests in each single performance. Moreover, as Chapter 3 has explained, it exists or resides in the collective of body/minds and artefacts (people and things) that carry the practice. There is thus not one place, instance, person or artefact that can represent the entity as a whole. Instead, a designer interested in the practice-as-entity has to rely on various sources of inherently partial knowledge. While the following section will zoom out from the details of elements and links, Section 5.4 will return to the challenges involved in unravelling practices(-as-entity).

## 5.3 A model for taking practices as a unit of analysis

In a sustainable design context, the primary goal of studying practices is identifying opportunities for deliberate intervention that can achieve or facilitate change towards configurations with lower levels of resource consumption. In this respect, the disposition of a designer conducting research is basically different from that of a social scientist, whose main concern is to gain understanding of something. This does not mean that the designer does not strive for understanding, but understanding is not the end-result; it is required for the identification of opportunities for intervention.

Understanding in itself, however, does not automatically lead to the identification of opportunities for intervention. Although opportunities for intervention can be identified through a (seemingly) ad-hoc process of data gathering and analysis, as illustrated for example by Hielscher (2008) and Scott (2009), this section proposes a particular framework for structuring the search. The model is expected to make practice-oriented design more accessible for designers, to make the approach applicable beyond the specific projects it has emerged from and, in line with the long tradition of models in design, is argued to improve the chances of success in the identification of feasible directions for further exploration (Buijs and Valkenburg 2000). The model, visualised schematically in Figure 5-5, contains activities (circles) and intermediate results (squares). The model's different parts and their relations are explained in detail below, together with recommendations on collecting the required data. An exception is made for gathering empirical data, which, because of commonalities between the different forms of practice analysis in the model, will be addressed in Section 5.4 separately.

### Framing the target practice

Before going deeper into the model, some attention is needed for the starting point of the analysis, which assumes a certain selected target practice. Selecting a target practice depends on the context of the design project. However, since the framing of the target practice forms an important and possibly determining part of the process, some observations from the empirical projects are offered here.

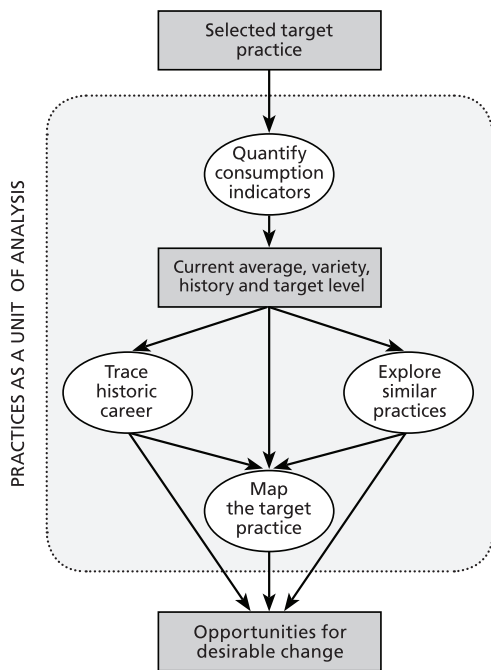


Figure 5-5 Model for taking practices as a unit of analysis and identify opportunities for intervention in a selected target practice (circles represent activities, squares intermediate results)).

capture this target practice and to compare it to varieties outside of the selected framing. In the empirical projects for example, the focus has been on the Netherlands (sometimes extended to Europe), but nation states do not have to dictate the framing. Within the broad category of household practices, all kinds of groupings of varieties can be distinguished. Some examples for bathing are: showering and taking a bath, morning and evening baths, private and communal bathing – each implying a different sub-group of carriers.

A third recommendation is to frame the practice as an activity. The staying warm at home projects, for example, started from the observation that in Europe, heating of the home accounts for the bulk of household energy consumption. However, heating of the home is not a practice. In these projects, the practice was reframed several times along the way, resulting in a rather long and complicated framing that was later shortened to practices of staying warm at home. What becomes clear from this example is that framing of the practice can be adjusted during the project. Initial framing of the target practice merely forms the starting point for the first step in the analytic process, being the quantification of consumption indicators.

First, it is recommendable not to frame the practice too narrowly. In the bathing projects for example, when looking at statistics on water consumption and similar studies within sustainable design, framing the target practice as ‘showering’ would have been the most obvious choice. However, the choice to approach it from the somewhat broader category of bathing made by Scott (2008), has from the onset opened up the mind-set of those involved towards alternatives for the resource intensive shower paradigm.

Secondly, counteracting the first recommendation, the target practice should not be framed too broadly. Household practices like bathing and staying warm, but also others like cooking, cleaning, sleeping, dressing and receiving guests, are so widespread that they are carried by a large percentage of people, if not all. For the proposed approach to work, the framing should be specific enough to isolate a sub-group of practitioners or carriers. The more narrowly a practice is framed and thus the smaller its group of carriers, the easier it becomes to analyse and

### 5.3.1 Quantifying consumption indicators

The first step in the recommended practice analysis process is gaining an overview of the levels of resource consumption involved in the performance of the target practice. Because levels of resource consumption are so central to the approach, consumption metrics are added to the images-skills-stuff model, as shown in Figure 5-6. The white circles in the figure indicate that the practice is at this point not analysed yet in terms of the elements and links involved.

For quantifying direct resource consumption, expanding the unit of analysis from interactions to practices means that resource consumption is described per unit of time

per person or household and not per instance of use of a product. For example, in the empirical projects, consumption was described in terms of litres of water used for showering per person per week, or energy consumed for space heating per household per year. Regarding these indicators, three main types of consumption data are collected: current day averages, varieties on this average and historic trends. This data is used to compose an overview of consumption levels and to determine a target level.

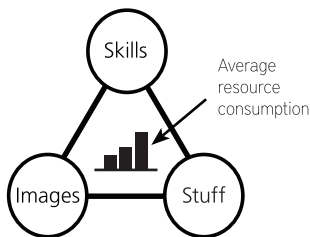


Figure 5-6 The practice as a constellation of images, skills and stuff and a certain average level of resource consumption per performance.

#### Averages and variety

To be able to talk about reductions in resource consumption, a benchmark consumption level, i.e., a base level to reduce from is required. This base level is represented by a current average. Besides current averages, however, a practice-oriented analysis includes an interest in deviations from this average and in extreme values, both within the target

practice and in similar practices outside of it. This position acknowledges the high variety in performances and thus in levels of resources consumed that exists within each practice. Moreover, it highlights, in order of magnitude, examples of manifestations of similar practices with a relatively low level of resource consumption. For example, bathing in India entails strongly lower levels of resource consumption than bathing in The Netherlands, and on average the Japanese manage to stay warm at home using a fraction of the resources Dutch people require in the same practice. This idea of variety in levels of resource consumption between similar practices is visualised in Figure 5-7.

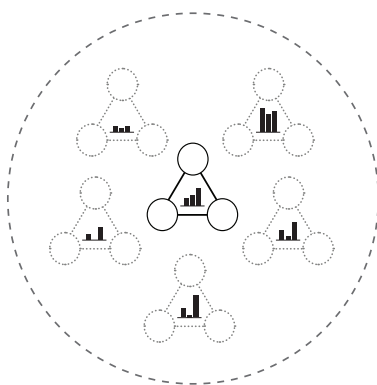


Figure 5-7 Levels of resource consumption of the target practice and several varieties.



## Historic trends

Besides current averages and varieties within and outside of the target practice, this first quantitative exploration collects data on the historic developments of resource consumption of the target practice. This data is useful for two main reasons. One, because it gives an idea of long-term trends and expectations for the near future, and two, because it highlights an order of magnitude of less resource intensive varieties that have worked in the past. Figure 5-8 visualises this idea of historic development in levels of resource consumption. How far to go back in time depends on the practice, but the empirical projects showed that going back at least a century is far more insightful than going back just a couple of years. It has to be noted however, that obtaining data may in some cases only be possible on the basis of qualitative descriptions of historic practices, which means that an overview can only be obtained in parallel with the detailed analysis of the practice's historic career and not before it as suggested in the analytic model.

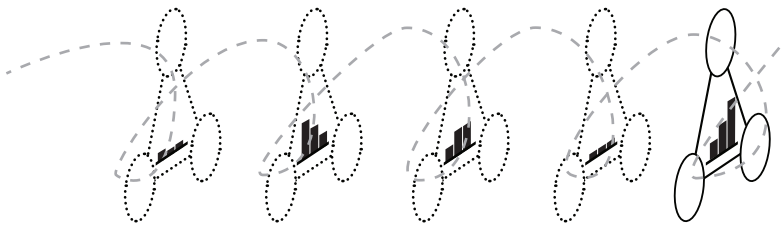


Figure 5-8 Potential trajectory of varying levels of resource consumption of the target practice over time.

## Determining a target level

Based on contemporary and historic variety in levels of resource consumption of the target practice, a theoretical target level (Figure 5-9) is selected. The target level is meant as a point of reference to trigger an ambitious search for opportunities and not as a requirement to judge eventual success of an intervention. Based on the idea that varieties of the practice represent configurations that work or have worked in the past, the target level is based on varieties at the lower end of the scale. Besides the

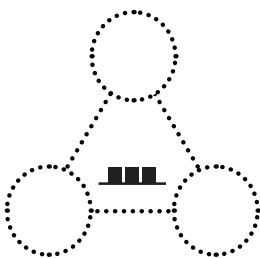


Figure 5-9 The target level of resource consumption.

idea that levels of resource consumption of the target practice are currently too high, determining a desirable level to change towards is a crucial and sensitive normative characteristic of the proposed approach. Crucial, because as observed in existing sustainable design approaches, when the target level is taken too close to contemporary averages, or not defined at all, there is a risk of achieving incremental reductions at most, and sensitive because the choice is always to some level arbitrary. When taking no resource consumption at all as the ultimate limit, no life would be possible. Reasoning back from this limit brings to the fore ideas of basic human needs for subsistence. Although it can be argued that barely surviving is not an acceptable way of living, a practice-orientation takes the stance that what is

acceptable is something that is eventually formed in performance. In other words, needs are made, they are part of practices and thus subject to change. In order to face the challenges of required reductions of 70%, as introduced in Chapter 1, challenging targets should be selected. In the empirical projects, these targets were based on similar varieties with strongly lower levels of resource consumption combined with a notion of basic human needs. In the bathing projects for example, a reduction from 340 litres of warm water consumption per person per week to 105 litres was set as a target. This target is based on current averages and a combination of consumption levels in India, Dutch consumption levels of the 1950s and the UN recommended minimum water availability for bathing. The following section will elaborate on ways of collecting data for the creation of an overview of consumption indicators.

### Collecting quantitative consumption data

There is a variety of sources to collect the required data on household resource consumption. However, even when you know what you are looking for and know where to look, it is not easy to compose a comprehensive overview of averages, historical trends and variety. For example, aggregate data on electricity, water or gas consumption per household is not very useful when looking for consumption metrics on a practice level. Some sources show, next to averages, standard deviations or even extreme values, but most do not. In the bathing case, data on variations was obtained through personal communication with the conveners of a detailed water use study. In the staying warm case, a study on a number of specific housing projects provided some insight in the range of variety in levels of resource consumption for space heating. As mentioned, some sources contain a trend over time, but very few go back further than 10 or 20 years. Key sources for consumption indicators used in the empirical projects contained only averages and went back only as far as 1992 and 1990 respectively. Therefore, an overview of historic developments in levels of consumption could only be made after consultation of a variety of sources, including a set of qualitative descriptions from which levels of consumption could be estimated. Finally, systematic data for developing countries is often lacking and data for different countries or sub-groups is not always on the same level (e.g. water use for personal hygiene and water use for showering are not directly comparable). Two other key sources in this phase of analysis that are worth mentioning were the paper 'Basic Water Requirements for Human Activities: Meeting Basic Needs' (Gleick 1996) and a report titled 'Energy Requirements for Satisfying Basic Needs' (Zhu and Pan 2007). These sources have been used, in addition to data on varieties with a low level of resource consumption, to determine target levels.

### Overview of quantitative consumption data

Figure 5-10 visualises how the different types of data (current day averages, varieties, historic data) collected in this phase and the selected target level relate to each other, both in terms of consumption levels and in the setting of their related practices. This overview forms and intermediate result in the practice innovation process, and a framework to guide subsequent analysis.

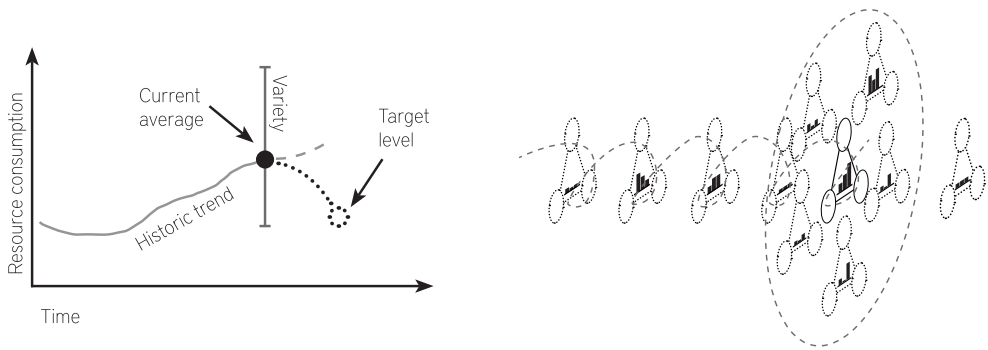


Figure 5-10 Overview of types of data collected for quantifying consumption levels in terms of numerical values (left) and in relation to the practices they are implicated in.

The next step in the practice analysis process is analysing the practices ‘behind’ these numbers. This step has three focal areas: tracing historic career, exploring desirable varieties and mapping the target practice. Result of this step is the identification of opportunities for desirable change.

### 5.3.2 Tracing historic career

A review of existing approaches in practice-oriented design has indicated that attention for the historic career of a target practice can greatly contribute to both understanding it and finding opportunities to change it. Along these lines, one of the tenets in the POPD manifesto reads:

‘POPD understands that history matters! Understanding the dynamics of practice means understanding continuities and patterns of co-evolution over time: look backwards to see forwards.’ (Shove and Watson 2006)

#### Understanding the target practice

What analysing the historic career of the target practice has shown to contribute to in the empirical projects is understanding the target practice and how it is both stable and dynamic. Historic analysis reveals elements that have proven core to the practice, such as for example water in bathing, elements that are more recent but literally fixed like water and gas infrastructures or central heating, developments that are difficult to reverse, like knowledge of bacteria and viruses or expanded expectations of living space, or links that have become deeply engrained, like those between cleanliness and social status. However, it also highlights how the complexes of images, skills and stuff making up the target practice at different moments in history have changed over time, sometimes even diametrically. For example, bathing has shifted from being a social to a private activity, and from a health threat to a cure and public health requirement. It also revealed how some elements are not as fixed as

they may seem from a current day perspective. For example, while showering seems an absolute necessity for Dutch people today, it has only recently become popular.

Because an analysis of changing practices-as-entity implies analysis ‘both of the history of the elements involved and of the dynamic and often uncontrollable or emergent relation between them’ (Shove and Walker 2010), results of such analysis are best represented in narrative form. In addition, to gain an overview of different configurations of elements over time and ways in which the practice has changed, the empirical projects used additional tables. While bathing is described in terms of different constitutions of elements in different periods of time, the description of staying warm at home zooms in on shifts in the constitution of elements. While the overview of bathing particularly highlights stability and dynamics of the constitution of elements, the overview of practices of staying warm highlights how elements have been recruited into and have disappeared out of configurations over time. For example, with the introduction of liquid fuels, a range of stuff and skills such as mending coal fires and coal scuttles became obsolete.

### Inspiration for less resource intensive configurations

A second function of historic analysis is obtaining insight into less resource intensive configurations of a practice. Since overall household resource consumption has in most parts of the world steadily increased over the past centuries, it can for many practices be expected that their levels of resource consumption have increased over time. Historic manifestations of the target practice are therefore likely to represent examples of less resource intensive varieties that have worked in the past. This does not mean that the way things were done in the past can simply be brought back; those practices worked as part of another web of practices and may therefore not work today. They can however form a source of inspiration for the identification of desirable, yet feasible directions for change. For example, the relation between clothing and indoor temperature settings, or the observation that for centuries, and even for living generations, a basin, a jug and just a couple of litres of water have been sufficient means to get rid of ‘dirt’ and achieve socially acceptable levels of cleanliness.

Although representing a particular interpretation of the historic career of the target practice, what both overviews highlight is the temporality of the current status quo and the possibility of extensive change in the future. These functions of tracing the historic career of the target practice are summarized in Figure 5-11.

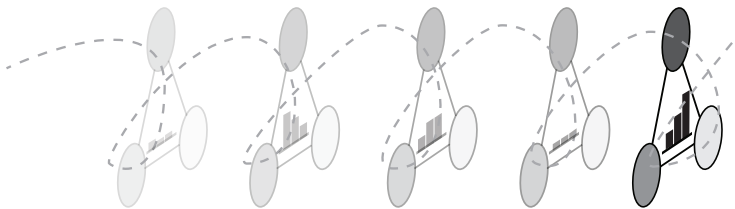


Figure 5-11 Tracing the practice's historic career gives insight into its current configurations, their potential future paths and ways in which less resource intensive variations were constituted

## Sources of information

Although somewhat outside of mainstream design literature, the empirical projects described in Chapter 7 and 8 have shown that sources of information for tracing these practices back in time are available. Some even provide ready-made historical overviews. These overviews cover various time spans in various levels of detail. Examples used in this thesis are Overbeeke's (2001) thesis 'Stoves, geysers and cookers; choice processes and energy consumption in Dutch households 1920-1975', which treats a relatively short time span in a highly detailed way and focused on the Netherlands, and the far more general 'At home: a short history of private life' by Bill Bryson (2010), which goes back approximately 150 years. On a different scale, Stuller (1991) covers over 2000 years of bathing practices in just one article. While such overviews can be found on a variety of topics, there are alternative sources for historic analysis that can be consulted. Examples are historic documents (in the bathing projects, Kira's 'The Bathroom' (1976) was partly treated as such), museums of history (useful also for obtaining visual material or the possibility to interact with objects used in the past), experts (for example those connected to museums of history), and people from previous generations in general. Section 5.4 will present some recommendations for interviewing people from previous generations as a specific research method.

### 5.3.3 Exploring similar practices

In addition to tracing the target practice's historic career, the analytic model recommends exploring desirable, similar practices. In the proposed approach, the selected target practice forms a starting point to change from, while different but similar practices, in space and time, form both points of reference to position the target practice against, and examples to identify opportunities for change.

#### Positioning the target practice

It was found in the analysis of existing practice-oriented design approaches, and confirmed in the empirical studies that by studying varieties of the target practice, the designer obtains a certain distance from it and creates points of reference that can highlight aspects of the practice that may have otherwise remained unnoticed. For example, the standing posture in showering that was highlighted in reference to forms of bathing performed in a sitting posture, or the idea of space heating versus person heating that emerged after studying practices of staying warm in Japan.

#### Desirable practices

A second goal of studying varieties is to flesh out the less resource intensive practices identified in the overview of levels of resource consumption (Figure 5-12). Again, it is important to note that these desirable practices cannot simply be transferred into the target practice because they work in a different setting, but they can form a source of inspiration for how the practice can be configured differently. For example, the Indian bucket bath is far less resource intensive than the Dutch shower. This insight contributed to the selection of bathing with contained water as an opportunity for change. Whether

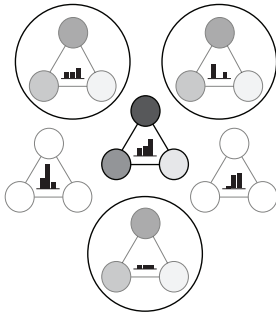


Figure 5-12 Select and analyse similar practices with resource intensities lower than the target practice.

a lower resource intensive configuration is considered a variety of the target practice, or a similar, but separate practice can be a point of debate, but in the end it doesn't matter for the type of analysis conducted. In the two empirical projects, the varieties studied were examples in other countries, but studying similar practices does not necessarily mean crossing borders. A study affiliated with this thesis work, for example, studied plant-based eating as a desirable form of eating practices in the Netherlands (Putman-Cramer 2011).

### Sources of information

Again, literature is the first source of information to turn to when investigating practices in foreign or sub-cultures. Describing such practices is the field of expertise of (social/cultural) anthropologists. Works used in the empirical projects were for example Clark's 'Japan: a view from the bath' (1994), which was highly focused on the topic of interest, and the more general 'The Japanese House' (Daniels 2010). For India, however, it turned out to be difficult to find anthropological descriptions of bathing practices. Another problem with these accounts is that, other than historic accounts, they form a snapshot and thus easily become outdated. For example, bathing in Japan has presumably changed quite a bit in the almost 20 years since Clark published his book. Another, more popular and up-to-date source of information about practices in other cultures are writings directed at international travellers. Tourist guides and blogs, although variously reliable, provide hands on information initiating the novice into the practices of the country they are visiting. These sources thus tend to present practices on a silver platter. Still, information on required levels of detail is not always available. Therefore, a particular approach for collecting data on practices in other cultures was developed within a master graduation project related to this research. The approach was applied in an empirical study on bathing practices in India and Japan (Matsuhashi et al. 2009) and will be explained in Section 5.4.

### 5.3.4 Mapping the target practice

When the designed is a carrier of the target practice, as was the case in both empirical projects, studying it is especially challenging. As Hockey concludes in his paper on researching peers and familiar settings, '[t]hat which is closest may well be that which is most difficult to see...' (1993: 221). Tracing a practice back in time and exploring similar practices among different cultural groups provides some distance from which to see familiar practices more clearly (Figure 5-13). It is therefore advised in this approach to study the details of the target practice after performing these other two analytic activities. Nonetheless, choices have to be made about the angle to take when presenting an

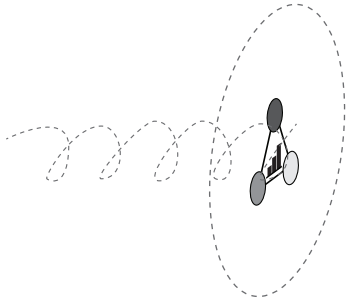


Figure 5-13 By analysing historic career and alternative configurations, the target practice is highlighted and fleshed out.

overview of the target practice. In making these choices, the objective of the overview should be leading. In the empirical studies, analysis of the target practice led to two main results. The first is an overview of relations between resource consumption and the constitution of the practice, and the second, following from this overview is a list of core characteristics regarding opportunities for change in less resource intensive directions.

### Connecting consumption levels and configurations of elements

In the context of sustainable design, analysis of the target practice pays special attention to how its current constitution is related to its resource requirements. Questions of why the practice has the level of resource consumption it has, and how this is related to the way it is constituted, form an important first step in identifying opportunities for change. In the empirical projects, a dissection into relations between images-skills-stuff elements and a set of practice specific consumption indicators turned out to make most sense. In showering, these indicators were flow, duration, frequency and temperature of showering, and in the staying warm projects, indoor temperature settings became central in making sense of the relation between practices of staying warm and their levels of resource consumption.

### Inertia, priorities and tensions

The overview of relations between consumption indicators and the constitution of the practice forms the basis for the identification of three main sets of conclusions about the target practice. These include a list of strong links and core elements that give an idea of the inertia of the practice, threats and trends regarding resource consumption, which highlight points of priority for intervention, and finally a set of tensions, indicating potential opportunities for intervention in the practice and possible ways of disrupting its current configuration. Besides studying the target practice, another way to highlight tensions that came to the fore in the empirical projects is to take a close look at the moments when the currently dominant practice became successful. In such transformational moments, advantages and disadvantages of the practice that later disappear into the background are discussed widely. For example, in marketing campaigns for products associated with the practice or in responses to new products by novice users. With the introduction of central heating, for instance, producers of stoves started to position their products as the more cosy alternative. And in bathing, Kira explains that novice users of the shower experienced it as 'uncontrollable, destructive and rough', difficult to get clean by and uncomfortable because it required a standing position (1976). This knowledge could be used to problematize central heating and showering in the light of a more desirable alternative.

As observed in Chapter 4, tensions in the practice have to be approached with care. Clearly, the practice works in its current configuration for those carrying and performing it. When identifying tensions, the designer has to be aware whether the tension exists in the practice, or whether this is a tension merely identified from the normative point of view of the designer. For example, in the bathing studies, a tension was identified between common understandings of proper shower frequencies (i.e., daily) and actual shower frequencies. This tension became clear through remarks of practitioners and can thus be viewed as internal to the practice. Another tension identified was between the paradigm of flowing water and getting clean. This tension was identified by investigating the chemistry between water, soaps and skin and from remarks of experts, but it is not something that is present among carriers as a tension; generally, people feel they get properly clean in the shower.

### Sources of information

Mapping of the target practices was done using a wide variety of sources, including the authors own experiences and informal conversations. These sources of knowledge about the target practice will be discussed in detail in Section 5.4.

### Identifying opportunities and directions for change

Keeping in mind the selected target levels for resource consumption, opportunities for change identified in the projects combined tensions in the constitution of the target practice with opportunities found in more desirable variants (contemporary or historic) of the target practice. In the bathing studies, for example, a strong connection was found between the paradigm of flowing water that is inherent in showering, and high and raising levels of resource consumption, while at the same time several (implicit) tensions were found related to this paradigm. Examples from other cultures and bathing practices in the past highlighted washing with water from a reservoir as a strongly less resource intensive alternative. Thus, making a shift from washing with flowing water to washing with water from a reservoir was identified as a plausible and desirable direction for further exploration. In the staying warm projects, a practice-oriented view on comfort as a negotiable construct opened up opportunities for strongly reducing indoor base temperatures, which were identified as main indicators for levels of resource consumption. Prerequisite for making this work is to offer people an expanded set of ways to make themselves comfortable. Based on the identification of Dutch heating practices becoming increasingly space oriented, the direction for design became to explore supplementing these with more person oriented ways of staying warm. Although context dependent, both lines of reasoning follow a similar pattern that is supported by the data gathered in the different parts of the practice analysis model.

In conclusion, like any design model, the approach recommended here is not a recipe for success. It is argued however, based on experiences in a series of empirical projects, to be able to structure a practice-oriented analysis process for the identification of plausible, yet desirable opportunities for design intervention. These opportunities form the starting point for the next, generative phase. Before going to this generative phase, this chapter closes with a set of more detailed considerations and recommendations to gather empirical data on practices for designers.



## 5.4 Challenges of and recommendations for analysing household practices

The previous section proposes a general model for taking practices as a unit of analysis in sustainable design. Because sustainable design is in this thesis framed as design directed at reducing levels of resource consumption in households, such analysis inherently deals with household practices. This section first outlines a number of specific challenges of analysing contemporary and historic household practices, and subsequently offers a number of recommendations for gathering empirical data on them in the context of sustainable design projects.

### 5.4.1 Challenges of studying household practices

As explained in Section 5.2, the practices(-as-entity) can only be studied indirectly and designers therefore have to rely on various sources of inherently partial knowledge. These sources can be summarized as the bodily performances in which the practice manifests, and practitioner's rationales and material artefacts that carry the practice. The sections below discuss these sources and the challenges entailed in accessing them.

#### Bodily performances

As explained in Section 5.2, it is in performances that subsets of elements comprising the practice-as-entity are actively integrated. However, directly observing single performances, in the case of household practices, is often practically impossible. Household practices can be highly private, such as bathing and hair care (Hielscher 2011), or strongly dispersed in time, such as staying warm. Moreover, the domestic setting, as opposed to for example public settings, makes observing participants, without influencing the performance very difficult (a nice illustration of this point is worked out in the movie *Kitchen Stories*). Additionally, regardless of these difficulties observation (alone) is not the most effective way of gathering information about the practice-as-entity, because each single performance represents just a tiny part of this entity. Discursive accounts can give a more complete overview of the multitude of elements and links in the practice-as-entity, because through them the designer can get access to the variety of performances familiar to the participant. Moreover, discursive accounts can provide access to aspects of practical knowledge that will, in normal performance, be left unexpressed. It is for example not possible to observe what someone is feeling, smelling or thinking.

Giving accounts of mundane, routine performances, however, is not easy for people. One, because this is not something they are used to doing. Two, because in some cases it can be embarrassing and private. And three, because performances are routine and therefore executed without much deliberate attention. Hielscher, when reflecting on her study into hair care practices relates for example:

'Numerous times during the interviews women asked if they were 'boring me to death', as they were talking about mundane activities in great depth.' (2011: 71)

Additionally, as in bathing for example, cleaning genitals or details of smells and dirt are sensitive topics for most people that are difficult to address in an interview.

### Practitioners' rationales

Besides detailed accounts of (a variety of) routine performances and bodily knowledge, discursive accounts can also give insight into what Shove describes as 'the range of rationales that justify and at the same time provide a guide for practice' (Shove 2003). This range of socially shared rationales, however, is not easy to access, especially not in the case of domestic practices. What makes this particularly difficult is the fact that in many of the mundane, everyday practices that are relevant to resource consumption in the home, the designer is an expert practitioner too. While it can be an advantage to be an 'insider' to the topic under investigation, because people are more likely to reveal private information when similar experience is more likely (Platt 1981), the presence of shared knowledge between interviewer and interviewee can inhibit the collection of clear and explicit data. Shared knowledge is an important element of the practice, but it is exactly there in what is not said or mentioned in everyday conversation between practitioners.

In interviewing, there are several strategies to reveal these common understandings. For example, something Kvale refers to as 'deliberate naïveté' (Kvale 1996), in which the interviewer takes the role of a novice, asking the interviewee clarifying questions about things the interviewer 'actually' knows. However, the role of someone not knowing anything about showering or thermostats is rather impossible to keep up for a Western European. Moreover, taking this role can be risky; there is a thin line between being an interested interviewer and being regarded irritating or even crazy. Famous in this regard is the work of Garfinkel.

Besides recognizing that common understandings remain implicit in everyday interaction, Garfinkel (1964) also observed that people are generally not able to verbalize them even when asked. Therefore, he designed a set of experiments to reveal what he refers to as 'the common sense world of everyday life'. Students were instructed to, in everyday conversations, without warning ask their conversation partner to 'clarify the sense of their commonplace remarks'. They did this by repeatedly asking 'what do you mean by ...' to common questions like 'how are you' or remarks like 'I'm feeling tired'. Such experiments, Garfinkel argues, have the capacity to produce reflections through which the 'strangeness of an obstinately familiar world can be detected' (Garfinkel 1964: 227). However, when challenging everyday understandings by frequently asking for clarification during a normal conversation, Garfinkel's experiments also show that one easily gets categorized as unreliable or even mentally ill. After just a few sentences, conversation partners would call the students 'sick' or get seriously annoyed. It has to be noted that an interview is a particular form of conversation in which an interviewee will be more open to answer clarifying questions than in the type of conversations described by Garfinkel. Nonetheless, asking clarifying questions to participants, and having them explain common understandings and well understood rationales in detail can be a great challenge, and can put pressure on the relationship between the designer and the participant.

## Material artefacts

Besides being carried by practitioners, practices reside in the material artefacts that form part of the practice. Things cannot be interviewed, but they can convey information about the practice. In the words of Reckwitz, things 'enable and constrain the specificity of the practice' (2002b: 212). What was found in the empirical studies, however, is that these allowances and constraints are necessarily relative and the way they are uncovered strongly dependent on the implicit or explicit reference points taken when approaching the practice. For example, the obvious point that showers (in their design common in the Netherlands) allow for use primarily in a standing position, was highlighted when a Japanese student compared ways of bathing in India, Japan and the Netherlands. Because being so obvious, this point may have been overseen without the identification of other common bathing postures. Conversely, the fact that Dutch shower design makes it quite impossible to wash your car in the shower for example, is not highlighted until this way of use surfaces as common elsewhere, which it so far did not. Revealing the allowances and constraints of the artefacts implicated in the practice is therefore dependent on the reference points taken when approaching them.

In summary, it can be concluded that obtaining an overview of a practice-as-entity is challenging, and always incomplete and temporal because:

- The practice-as-entity can only be accessed indirectly through performances, people and artefacts.
- The entire range of varieties of manifestations (performances) that make up the practice-as-entity can never all be taken into account.
- The range of rationales, or mundane, common understandings between practitioners are difficult to access, especially for an insider.
- The affordances and constraints of artefacts depend on the angle from which they are viewed, i.e., the point of reference taken
- and finally, the practice continuously changes, so any overview is necessarily a snapshot.

## 5.4.2 Recommendations for empirical data collection

Recognizing the challenges and limitations set out above, the following sections contain a number of recommendations on obtaining empirical information about contemporary and historic practices. These recommendations are based on experiences from the empirical projects. The section deals with how interviews can be used to access bodily performances and practitioner's rationales, how workbooks can support and supplement gathering this type of data. Thirdly, it deals with the topic of studying material artefacts.

### Interviews

In the empirical studies, interviews were conducted for gathering data about bodily performances and underlying rationales. Relevant for all types of interviews is that in the context of sustainable design, a particular goal of obtaining empirical data about practices is making a link between levels of resource consumption and the constitution

of the practice. This particular goal should be reflected in the topic list the designer takes to interviews. In the bathing projects for example, such topics were: bathing frequencies, times of day and durations, the use of soaps and/or shampoo and frequencies.

To get an idea of bodily performances without directly observing them, the interviewer aims to get insight into all actions taken and their sequence. Such interviews can start with a general question to the participant to explain what type of practitioner they are. For example, 'can you explain what type of bather you are' or 'how do you go about staying warm at home in winter?'. However, interviewees tend not to provide a great level of detail in their explanations. To obtain more detail, it is helpful to assure anonymous treatment of data and to emphasise the interviewers interest in seemingly boring details. Additionally, several interview techniques can help people to recollect details of performances. Besides repeatedly asking for detail, examples are conducting the interview in the place or places where the practice is performed, using props (artefacts related to the practice), asking people to re-enact their routine, or evocative interviewing (Hielscher 2011). Beyond the interview itself, interviewees can be prepared for the interview through workbooks. The use of workbooks has a number of other advantages that will be discussed in more detail below.

Challenges and strategies for accessing underlying rationales differ depending on the type of practice studied, being historic practices, similar practices in other cultural settings or the target practice. Each will be briefly discussed.

To supplement accounts from literature on historic practices of staying warm with empirical data, interviews were conducted with two couples from previous generations. Because these interviews concern practices that are no longer performed, interviewees have obtained a certain distance from them, which makes accessing the practice-as-entity relatively easy. Keeping this distance can be enhanced by phrasing questions in a general instead of a personal way. For example, asking 'what was it like in winter during your childhood', instead of 'how did you go about staying warm in winter when you are a child'. In the empirical projects, this question, with the occasional question for more detail, was sufficient to obtain an account that greatly enriched the data available from literature. Especially helpful in this regard was conducting the interviews with couples. They would complement or contradict each other, thus providing a rich narrative.

Regarding practices in other cultural settings, a comparison was made between Dutch, Indian and Japanese ways of bathing, and ways of staying warm in Japan were studied. In this case, it is the designer that has a useful distance from the practice, and is thus in a position to ask explanatory questions more freely. This distance comes with its own challenges, but other than referring to the extensive body of literature in anthropology on this topic, they will not be further discussed here.

In case of interviewing people about the target practice, both interviewee and designer will generally be carriers of the practice. As explained earlier, this poses great challenges. Therefore, it is recommendable that the designer collects information about its historic career and examples in other cultural settings before conducting these interviews. This way, a certain distance can be created. Still, it remains challenging to uncover underlying rationales and common understandings. A couple of recommendations can be made regarding types of questions to ask. Since these rationales include skills of judging whether something is good, clean or proper.

A particular type of questions can uncover these skills, for example ‘how do you know whether your hair is dirty’ or ‘how do you know when to ventilate’ and to aim for concrete answers like ‘when my fingers become sticky when I go through it’ or ‘when the windows fog’. Moreover, for uncovering common understandings, the interviewer should be particularly attentive to terms like ‘long’, ‘far’, ‘a lot’ or ‘low’ and ask for clarifications. In the bathing study for example, if participants would typify themselves as taking ‘long showers’, the interviewer would ask to specify what is long, aiming for a number of minutes. What such adjectives imply is a norm, as perceived by the interviewee, from which he or she feels to deviate to some extent. An additional question could therefore be, if they for example feel 20 minutes is a long shower, what they then consider to be a normal shower duration. However, as mentioned, there is a risk of disturbing the relation with the interviewee by asking such ‘stupid’ questions. Another strategy for revealing common understandings is raising the topic of alternatives. Asking interviewees to compare the target practice to other, similar practices or to ask about exceptional situations (for example when on holiday), turned out to reveal underlying rationales that otherwise remain implicit. For example, when Daniel remarks that when on holiday he really likes to take a shower, but at home he clearly prefers the bath, because his bath is important to wash away fatigue of work, rationales for taking a bath are highlighted in reference to taking a shower (on holiday) (field study interview FamD). On the blog of the experiments in practice study, a participant relates that because her heater was broken, she took cold showers for two days, and another participant describes a camping holiday where one night she used a cold, dark, public bathroom to take a shower, because it was ‘the ONLY option’. For both these participants, not taking a shower at all was, even in these circumstances apparently not considered an option at all, which highlights daily showering as the norm for them.

## Workbooks

In the empirical studies underlying this research, workbooks were used both to support and to supplement the interviews. Workbooks can support interviews because they enable participants to make notes on their performances and experiences close to the

situation of performance. Moreover, a workbook can be in the field for an extended period of time, over the course of several performances, so participants can go through it at their own pace and questions can linger on during performances and thus stimulate reflection. To further support documentation of performances, workbooks can contain particular documentation formats, such as the action card format developed by Matsuhashi et al. (2009) in the bathing studies (Figure 5-14) and additional tasks, such as recording durations of actions or taking photographs of settings.



Figure 5-14 Workbook and action cards that were used in one of the bathing related projects (Matsuhashi et al. 2009).

Additionally, workbooks have a number of particular functions and advantages by which they do not only support interviews, but supplement them. These advantages are listed below and illustrated in the following figures with examples from the empirical studies:

- Workbooks can be used as survey forms (Figure 5-15).
- A workbook can contain explanations and explanatory figures (Figure 5-16).
- A workbook can ask participants to draw (Figure 5-17).

Fri 14 Sat 15 Sun 16 Mon 17 Tue 18 Wed 19 Thu 20

mapping your bathing routine iii

Since this study is about making bathing more sustainable we would like you to estimate your current resource consumption in bathing at home. Again we want to point out that this is in no way a judgment of your environmental consciousness; we are simply curious about how things work for you.

average number of showers per week and average duration:	_____ per week remarks: _____ minutes
average number of baths per week/month:	_____ per week/month (underline appropriate option) remarks: _____
kind (bar, liquid, other) and frequency of soap:	Kind _____ Frequency _____ remarks: _____
kind (bar, liquid, other) and frequency of shampoo:	Kind _____ Frequency _____ remarks: _____
other products you use:	_____
Other sustainability issues in	_____

Figure 5-15 A survey form in the experiments in practice workbook.

Studying material artefacts

Although things clearly play an important role in constituting practices, how to approach them in the context of practice-oriented design is a topic that writings so far offer little guidance on. This section therefore draws on the small pool of existing literature, and experience gained in the empirical projects conducted for this thesis. Two points of attention for studying artefacts for practice-oriented design are listed here: artefacts as part of a network of stuff and ‘future’ things.

In practice-oriented design, things are approached as part of a composition. The POPD manifesto states that

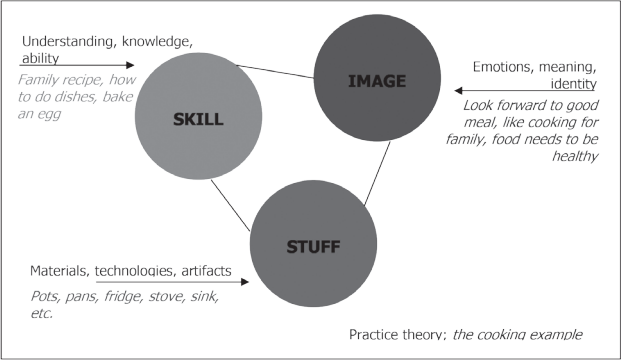
‘POPD recognizes that no object is an island, so it attends to the relations between products, not to objects in isolation.’ (Shove and Watson 2006)

To specify this, analysis of the material aspects of a practice includes simply all artefacts visibly deployed in the performance. In bathing and staying warm, these are for example taps, showerheads, thermostats and sweaters. The network includes the spaces in which performances take place, the human body, but also things not directly visible, such as

practice theory and co-design

The underlying framework of this study stems from the merge of two principles: co-design and social practices theory. In co-design, users are actively engaged in the product design process with guidance from a professional designer. In this method products are the main focus in the use context.

Social practice theory looks at consumption in a much broader sense; taking into account the interconnected elements of skills, images and stuff. This is explained below, using the practice of cooking as an example.



A limitation of social practice theory is that it does not lead to product ideas in itself. Therefore the idea arose to combine this theory with co-design techniques creating a method of experiments in practice.

Figure 5-16 An explanation of concepts from practice theory to support a particular form of documentation and reflection.

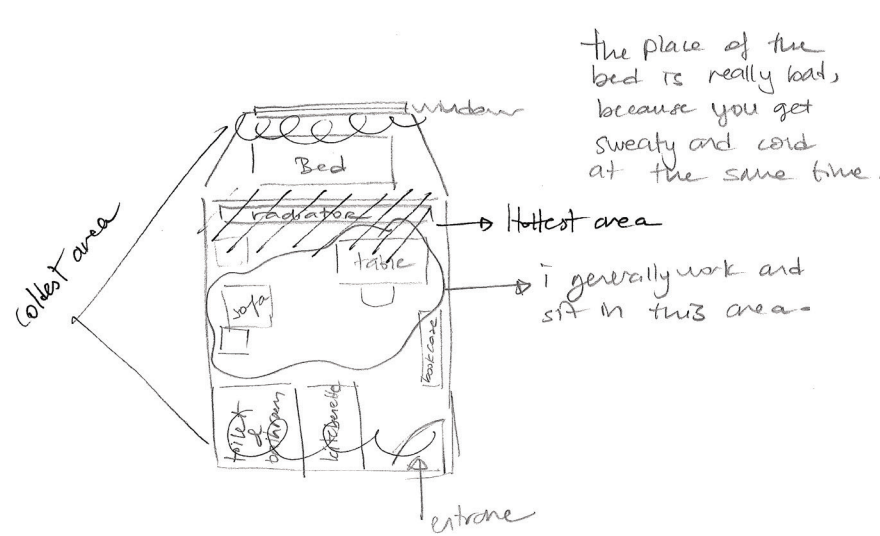


Figure 5-17 A drawing from a workbook in the trigger-product study.

water pipes, boilers, sewers, gas infrastructures, up to oil platforms and wastewater treatment, or the sun and clouds. Other than things obscured from direct view, the practice-oriented designer is also interested in things that are too little to see. The importance of things like sebum, grease and follicles already became apparent in Chapter 4, where they were brought to surface by Hielscher and Scott. Their relevance was confirmed in the empirical projects, where for example the importance of air and things like draught and ventilation came to the fore in the studies on staying warm. Products also easily overseen, but yet found important by Hielscher are things that are no longer used. Finally, besides listing all things, visibly and invisibly implicated in a practice, it is also important to look at their relations with each other. For example, Hielscher (2011) emphasises her observations of the ways in which things were organized spatially in her participants' homes.

While future performances or future people are not available for analysis, 'future things', or at least potential future things, in varying stages of development are widely available for study. New product proposals are widely available through websites, commercials, trade fairs, magazines, showrooms, blogs and so on. To analyse developments in the bathroom market, for example, the ISH fair (International trade

fair for the Bathroom, Building Services, Energy, Air Conditioning Technology and Renewable Energies) was visited twice. Studying such technological developments is a routine activity for industrial designers. The recursive relation between objects and practices, between design and use, as visualised by Ingram et al. (2007) in Figure 5-18, implies that new products both incorporate industry's ideas about current practices, and potential for future practices. Analysing new product proposals therefore reveals something about current practices, and about directions in which they may head.

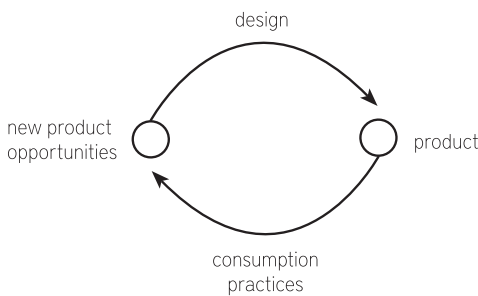


Figure 5-18 Cyclical model of designing and consuming (adjusted from Ingram et al. 2007: 3).

## 5.5 Conclusions

This chapter set out to provide an answer to the question 'What does it mean to take practices, instead of interactions as a unit of analysis in sustainable design?'. The recommendations presented above form a (possible) methodological answer to this question. From these recommendations, it becomes clear that the analytic activities in a practice-oriented approach differ from those in an interaction-oriented approach in a number of respects.

When looking at interaction-oriented approaches in sustainable design, analysis of the current situation focuses on a particular appliance and the way in which it is used. Consumption metrics, if quantified, entail average values of a single indicator, for example



average yearly electricity use of a fridge, or average water consumption per person per shower. The target level of resource consumption, again if specified, already contains the assumption of a particular type of change in the use of the product. For example, a certain frequency and duration of opening the fridge door, or a certain shower duration. In fact, the focus in this body of literature on selecting the right design strategy to achieve this 'sustainable behaviour' seems to assume that the 'good' or 'sustainable' behaviour related to the selected product is already known; it only needs to be made easier, clear or unavoidable for the users of the product.

A shift from interactions to practices as the unit of analysis in sustainable design entails more than broadening the focus from taking a shower to bathing, or from setting the thermostat to ways of staying warm at home. By including both history and contemporary diversity in the analysis, the target practice is positioned in its broader spatio-temporal setting. This positioning reveals larger changes and ranges of diversity in levels of resource consumption. This overview, in combination with the notion that needs, standards and norms are formed in practices and subject to change, justifies and stimulates the setting of challenging targets for reduction that look beyond the status-quo. Considering ideas of what is normal and thus acceptable as part of the practice, significantly broadens the scope for change that is considered in the project. However, these targets are not formulated in the form of particular behaviours or reconfigurations. Although inherently normative through its environmental orientation, the method acknowledges practices as having their own internal logic that works and makes sense for the people carrying and performing it. Consequently, configurations with lower resource intensity are viewed as emerging from, instead of the starting point of the generative phases of a practice-oriented design process. How these configurations emerge and what the role of the designer can be in this process will be discussed in Chapter 6.



# 6 Practices as a unit of design

## 6.1 Introduction

While Chapter 5 discussed what it means for sustainable design to shift the unit of *analysis* from interactions to practices, this chapter investigates what it means to shift the unit of *design* from interactions to practices in a sustainable design context. Once opportunities for designed interventions and promising, desirable directions for change have been identified through analysis, the focus shifts from understanding and gaining inspiration from what currently is, to generating increasingly concrete ideas about what could be in the future. The aim of this chapter is to provide an answer to the question: 'What does it mean to take practices, instead of interactions as a unit of design in sustainable design?'

The chapter starts with a theoretical account on how design, as a particular form of change, can be conceptualised in practice terms. Central to this account is the concept of reconfiguration. To translate this theoretical view into a workable design approach, a link is made between prescriptive design theory and the implications of a practice-orientation. In particular, participatory design, prototyping and iteration are discussed. Based on five generative studies conducted in the context of this PhD research that combined the idea of reconfiguration with these concepts from design theory, a general practice-oriented design cycle is presented and elaborated on in Section 6.4.

Again, the recommendations made in this chapter are based on insights obtained from the empirical projects described in Chapters 7 and 8, and are grounded both in design theory and in social theory. They do not form a rigid approach, although the method outlined can be applied in practical projects as it is, but rather the aim is to set out a framework that is open for further development and criticism.

## 6.2 Design in terms of practice theory

When positioning design in relation to practice theory, first it is important to make a clear distinction between change and design. Practices(-as-entity) change because of the sum of changes that happen in everyday performance. Change is omnipresent and continuous in practices but not initiated by anyone in particular or directed in any particular direction, while design is about initiating and facilitating change in preferred directions. Moreover, inherent in the idea of preferred directions are judgments of right and wrong, better or worse. In other words, these directions are preferred from a certain point of view, but could be non-desirable from another. Therefore, design is inherently normative.

The type of enduring, large-scale change aimed for in sustainable design implies change in the practice-as-entity; the overarching organizing structure of the practice. However, since entity and performance are so closely intertwined, they cannot be seen as separate from each other. As set out in Chapter 3, change in the practice-as-entity is both a consequence of and a catalyser for changes in performance. In order to form an understanding of how practices change, and eventually, what the role of design can be in this process, this section will first go deeper into the recursive relation between entity and performance by discussing two mechanisms of change: reconfiguration and repetition.

### 6.2.1 Reconfiguration

Shove et al. write that 'practices change when new elements are introduced or when existing elements are combined in new ways' (2012: 120). New here does not necessarily mean new to the world, but new to the particular practice-as-entity. Therefore, these 'new' elements and combinations (links) will here be referred to as *unfamiliar* elements and links. Notably, unfamiliar elements are not necessarily (only) things; they can also be unfamiliar skills and/or images. Situations in which a performance integrates unfamiliar elements or links, are by Reckwitz referred to as 'crises of routine' – Schatzki calls them

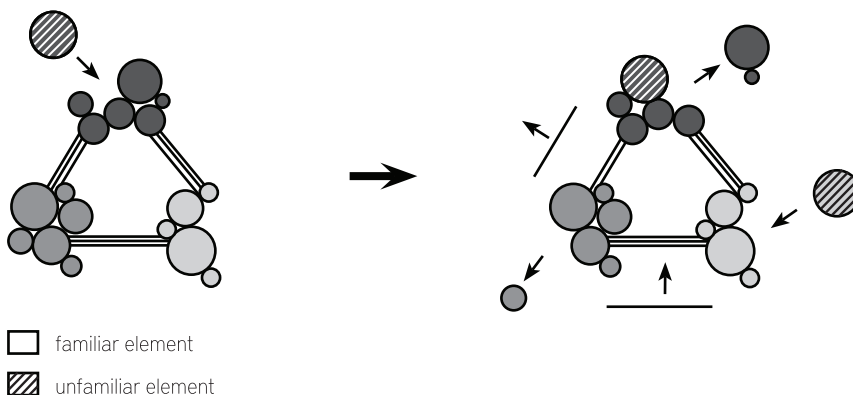


Figure 6-1 An unfamiliar element is integrated in a performance and the practice is reconfigured.

'contingent events' (2001: 53) and Shove et al. 'disruptive moments' (2007: 31) – in which the 'breaking' and 'shifting' of structures takes place (Reckwitz 2002a: 255). This breaking and shifting of structures is here referred to as reconfiguration.

Recruiting unfamiliar elements or links into a performance requires (more or less extensive) reconfiguration of elements and links into a new configuration that works and makes sense. In addition to the breaking and shifting of links described by Reckwitz, this process can also involve recruitment of unfamiliar elements, and rejection of existing ones. In practices of staying warm at home for example, the introduction of liquid fuel has rendered elements like coal sheds, coal scuttles, coal dust and skills of making and maintaining a coal fire obsolete, while piping, oil stoves and skills in preventing fires became required to make the practice work. This process of reconfiguration is depicted graphically in Figure 6-1.

As Shove and Pantzar point out, reconfiguration always happens through bodily performance:

'innovations in practice depend upon the *active integration* of elements, some new, some already well established, that together constitute what we might think of as innovations-in-waiting or proto-practices.' (Shove and Pantzar 2005: 48) (emphasis added)

The suggestion to visualise practices as groupings of elements and multitudes of links made in Chapter 5 is helpful in further explaining this idea of reconfiguration. For one, because reconfiguration happens in performance, it only integrates part of the elements and links contained in the practice-as-entity. Secondly, it shows that a reconfiguration is not a completely new configuration, but rather a mix of familiar and unfamiliar elements and links.

Important to note is that Shove and Pantzar refer to these reconfigurations as 'proto-practices' or 'innovations in waiting', and not as 'new practices'. One reason is that such performances in itself do not change the practice-as-entity. Only if the reconfiguration is repeatedly performed by several practitioners, can it become collectively recognized as normal performance and thus as part of the practice-as-entity. This point will be further explained below.

## 6.2.2 Repetition and recruitment

Before going into the relation between reconfiguration and repetition, it is important to explain something about the role of repetition in the relation between practice-as-entity and practice-as-performance. Schatzki explains that the practice-as-entity forms a structure that establishes certain forms of performance to be correct (in certain situations), and other forms of performance as acceptable (1996: 101). What Schatzki refers to as 'correct' can also be called mainstream. Mainstream is the type of performance most practitioners perform most of the time. For example, in the Netherlands showering is the mainstream form of bathing. Taking a bath is a less common form of bathing, but it is also acceptable.

Along the same lines, Warde explains that 'the patterning of social life is a consequence of the established understanding of what courses of action are not inappropriate' (2005: 140). Consequently, besides establishing whether a performance is correct or acceptable, the practice-as-entity also establishes what types of performance are inappropriate or unacceptable. For example, bathing in a canal is generally not considered an acceptable way of washing the body, and wearing coats indoors not an acceptable way of staying warm at home. Knowing about these categories is part of being a competent practitioner. Notably, these categories of correct, acceptable and unacceptable exist across many different dimensions and vary across sub-groups of carriers. For example, there are correct, acceptable and unacceptable frequencies of washing the body, correct, acceptable and unacceptable indoor temperatures, and so on.

As mentioned, there is a relation between the number of performances of a certain type and the categorization of this type of performance as correct, acceptable or unacceptable. This relation represents a relation between the practice-as-entity and the practice-as-performance. Figure 6-2 illustrates how the practice-as-entity is made up of a variety of situated performances.

What the figure also indicates is that there is no clear line between the categories; e.g., in some situations, for some people wearing coats indoors can be acceptable, while in others it is not. This does not mean, however that a type of performance only rarely performed is unacceptable per se. As Schatzki explains, there are 'ranges of acceptable doings and sayings broader than the behaviours already performed in the practice' (1996: 102). Therefore, it is possible that people happen upon new ways of proceeding that are found acceptable by other carriers of the practice.

Returning to change in practices, what is important to realise is that these categories of correct, acceptable and unacceptable are not fixed. What mainstream forms of bathing are, or acceptable indoor temperatures is something that changes over time. In bathing for example, mainstream practice has over the past century shifted from a weekly bath to (close to) daily showering (Hand et al. 2005). The relation between the practice-as-entity and the practice-as-performance thus conceptualised, highlights that the more a certain form of performance occurs, the more acceptable or mainstream it becomes. This also implies that the effects of any one performance fade over time and thus that a form of performance that is not practiced moves to the periphery of the structure (i.e., becomes a fossil (Shove and Pantzar 2005)).

Summing up, an unfamiliar element or link can change the practice-as-entity by becoming part of a reconfiguration that works, which subsequently recruits more, and more faithful practitioners. More precisely, it is not a particular reconfiguration that can spread, because by recruiting more carriers and through being performed repeatedly, the reconfiguration keeps on changing. Conversely, even if a performance itself, in a particular situation works for the performer, it may not be suitable for repeated performance beyond that situation, by the performer or by others. Links can be made that make no sense (beyond the particular situation) or elements can be integrated that are not available elsewhere. Having said this, the next section will return to the process of reconfiguration, explaining how it is not as straightforward as it may have been presented above.

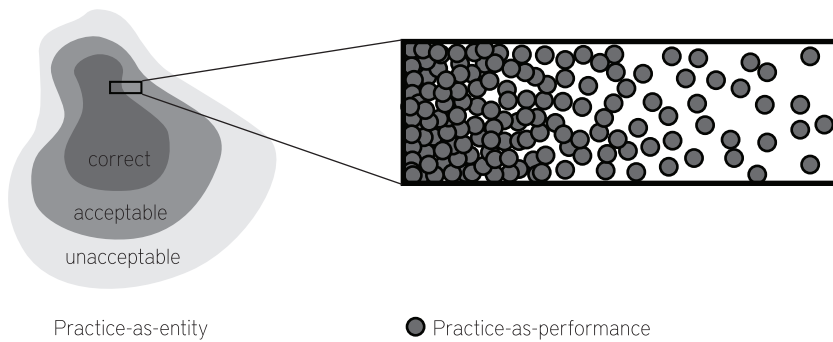


Figure 6-2 A reciprocal relationship between the practice-as-entity and the practice-as-performance [make 'unacceptable' lighter].

### 6.2.3 Adaptation, improvisation and experimentation

Following the terminology of Warde (2005), the process of (per)forming a reconfiguration (i.e. a 'beside normal' performance) is referred to as 'adaptation, improvisation or experimentation'. It has to be noted that since all practices change over time, change is part of normal practice. In fact, Reckwitz, connotes 'crises of routine' as 'everyday crises of routine'. Such situations happen so often that adaptation, improvisation and experimentation can be seen as routine parts of daily life, or what Schatzki refers to as dispersed practices (1996: 91) (see 3.7.2). For example, when camping in the wild people improvise a bath, or when the central heating fails, they adapt for example by wearing coats indoors. However, because this is where change happens, these practices are of core interest for sustainable design and are therefore described in greater detail. To make a distinction from everyday forms of improvisation and to step away from a link to an idea of emergencies or threat called up by the term crises, the types of crises meant here are further referred to as non-standard situations.

Going deeper into improvisation, adaptation and experimentation by using dictionary definitions and combining these with the ideas of change introduced above, more can be said about what they entail. Both adaptation and improvisation happen in the face of a non-standard situation and both are directed at adjusting a normal configuration to make it work in the situation at hand. They differ in their level of reconfiguration, with adaptation being less extensive than improvisation. Moreover, adaptation can be premeditated, while improvisation is inherently spontaneous. Experimentation is different from the other two in the sense that it does not necessarily imply a non-standard situation. Experimentation can happen in the face of familiar situations. It implies an active search for reconfigurations of existing normal practice. Moreover, it involves a process of planning, performing and evaluating. Based on dictionary definitions, the following definitions of adaptation, improvisation and experimentation in practice can be composed:

Adaptation: to adapt a configuration to fit a non-standard situation by slightly adjusting (familiar and/or unfamiliar) elements and/or their links.

Improvisation: to creatively invent a reconfiguration in the spur of the moment of a non-standard situation with what is conveniently at hand.

Experimentation: to think up, try out and reflect upon a reconfiguration.

Because adaptation and improvisation are so similar, they are from now on grouped under improvisation.

When talking about extensive reconfiguration, which is the type of reconfiguration aimed for in sustainable design, making a reconfiguration work through improvisation or experimentation is not the same as the everyday crises of routine that Reckwitz refers to; it is an iterative process that may require several performances and involving new recruits to the emerging practice. Being (dispersed) practices, carriers can have varying levels of competence in experimentation and improvisation. Additional complicating factor is the contradiction, indicated briefly in Chapter 3, of practices being both stable and dynamic. Practices can change through improvisation and experimentation, when unfamiliar elements and links are integrated into reconfigurations that are repeated and spread. However, at the same time, practices consist of complex configurations of elements that are in turn part of webs of practices that work. This creates a certain stability that makes them resistant to change. Introducing an unfamiliar element or link into this complex system may require (drastic) reconfiguration. Alternative responses to such a situation may be not to improvise or experiment, but to reject the unfamiliar element or link and continue business as usual, or even to abandon the practice altogether. In other words, making available unfamiliar elements does not mean that they will be integrated into performances or become part of the practice-as-entity. Reconfiguration – in a particular, desirable direction – is a process that takes time and effort and throughout which unfamiliar elements or links can be rejected.

Summarizing the previous discussion, facilitating extensive, desirable change in practices (which is taken to be an objective of those engaged in sustainable design) requires the introduction of unfamiliar elements and/or links, and their integration into reconfigurations through bodily performances. To make these performances work, existing structures need to be shifted and broken through repeated and iterative instances of improvisation and experimentation. Finally, to change the practice-as-entity, the reconfiguration needs to recruit more and more faithful practitioners, a process through which the reconfigurations itself will necessarily transform. Facilitating extensive reconfiguration in a desirable direction therefore requires:

- The introduction of unfamiliar elements and/or links
- Improvisation or experimentation
- Bodily performance
- Repetition, iteration and learning
- Continued monitoring and involvement



## 6.3 Integrating practice theory in design theory

Although practice theory has much to say about change, it has very little to say about how to deliberately ‘design’ change in a desirable direction. Fortunately, there is an extensive body of knowledge in the design disciplines that does deal with questions of ‘devising courses of action aimed at changing existing situations to preferred ones’ (Simon 1996: 111). In the empirical projects of this thesis, the requirements listed above were integrated into existing design approaches and in this process, these design approaches were transformed. The following sections will discuss three concepts from design and these processes of integration and transformation.

### 6.3.1 Participatory design

Participatory design is an approach to design in which ‘the people destined to use the system play a critical role in *designing* it’ (Schuler and Namioka 1993: xi, emphasis in original). Closely related is the concept of co-design. Co-design lets users, researchers and designers cooperate creatively so that they can ‘jointly explore ideas and concepts, make and evaluate sketches and tinker with mock-ups or prototypes’ (Sanders and Stappers 2008). Key points of co-design are the recognition that everyday people can become co-creators rather than just customers, and that users can contribute as experts of their own experience (Sleeswijk-Visser et al. 2005).

The idea of involving ‘future users’ as experts of their own experiences in the product development process resonates with the idea of reconfiguration. Reconfiguration requires knowledge of existing configurations as carried by current practitioners of a practice. Moreover, the idea of users as co-creators is reflected in the POPD manifesto’s (Shove and Watson 2006) tenet that everyone is engaged in ‘designing’ practices as part of every life.

However, a difference lies in *what* is viewed as the unit of design. The term ‘user’ implies a product development process, while in practice-oriented design, not the product but the practice is central. Moreover, a practice is not ‘used’; it is carried and performed. This also means that even when the ‘design’ is ‘in use’, i.e., when the practice has become accepted and is regularly performed, it keeps on evolving. Performers are thus not only involved in the reconfiguration or redesign of the practice, carriers continuously redesign the practice through performance. In other words, practice-oriented design is inherently participatory. This position follows the observation by McHardy et al. (2010) that design ‘does not lie in the hands of a single actor, but is instead distributed between multiple participants’. Additionally, if a product is developed in the process, the design of this product is also viewed as inherently participatory; what a product is, its meaning and how it is used is partly determined in practice. In this sense, the term participatory design, when used in a practice-oriented context, is a tautology. Taking practices as a unit of design implies a process inherently involving carriers of the target practice.

## 6.3.2 Prototyping

Design students are trained not only to communicate their ideas in words, but also in visualisations and physical form. These representations have several functions and several names in design theory. Here, 'prototypes' is used to group them. Hartmann et al. (2006) describe prototyping as 'a series of interactions between the designer and the design medium — sketching on paper, shaping clay, building with foam core', and view it as an essential part of successful product design. According to them, prototyping 'affords unexpected realizations that a designer could not have arrived at without producing a concrete artefact'. Prototyping is commonly connected to participatory design, where user involvement in the design process is facilitated by the communication of design ideas through prototypes in different stages of development (Svaneas and Seland 2004, Sanders and Stappers 2008). Prototypes used in the earlier phases of the design process are mostly generative, exploring how something could work, while in later phases the goal of making prototypes is mainly evaluative, assessing whether a product works as intended. Throughout these stages, prototypes develop from low-fidelity to high-fidelity.

Returning to practice-oriented design, the idea of prototyping relates to the idea of change through bodily performance and reconfigurations as emerging from performances. However, the prototypes generally referred to in design theory are prototypes of physical objects. In practice-oriented design, this concept is extended towards proto-practices, which include stuff, but also images and skills. A proto-practice or practice prototype is a worked out idea or suggestion of how things could be (in terms of configurations of images, skills and stuff). A practice prototype is performed, not used (in a performance). Importantly, a proto-practice, as opposed to a practice, is a configuration that does not work (yet), has not (yet) spread, and only works in a protective incubator environment (like a particular research situation). Like a product prototype, a practice-prototype can evolve from generative to evaluative and be low-fidelity or high-fidelity.

## 6.3.3 Iteration

Continuing on this idea of development from low- to high-fidelity, according to Roozenburg and Eekels (1998: 22), product development is an iterative process in which designs grow in subsequent cycles from vague ideas to concrete plans. A recurring theme in design theory is the idea that the type of projects designers (as opposed to for example natural scientist) tackle are wicked or ill-defined problems (Cross 1982, Rittel and Webber 1973), which do not have one solution or answer but rather a range of possible solutions. Therefore, understanding of the problem alone is not going to lead to a 'solution' or answer. That is why designers, according to Lawson (1979), use a 'conjectured solution' to define and redefine the problem at hand. This leads to an iterative refinement of what Cross (1982) refers to as abstract requirements and concrete objects.

The idea of iteration in design resonates with the idea that making an extensive reconfiguration work may require several cycles of improvisation and experimentation. In practice-oriented design however, there is no clear end point to the process. Practices

are never 'finished' or ready, they keep on evolving in various directions. As the POPD manifesto states:

'POPD never ends! POPD is implicated in the long term evolution of practices. POPD refutes the temporal linearity of contemporary product design. POPD does not end when the product sits on shelf. That moment is but one in the POPD'ers ongoing relationships with the practices in which they intervene.'  
(Shove and Watson 2006)

A configuration that works at one point in time, is likely not to work anymore in the future, simply because practices and the web of practices they form part of continuously change. A certain desirable configuration (i.e. with desired level of resource requirements) may work at one point, but ongoing involvement of the designer and subsequent interventions can be required to maintain this desired level of resource consumption on the longer term. Rebound effects, trends and varieties in performance will occur, but cannot be predicted. Therefore, the practice-oriented designer needs to keep track of these emergent developments in the target practice and possibly respond with additional interventions. In this light, the idea of solutions is not appropriate. In a practice-oriented view, the 'problem' of high and growing household resource consumption is not something that can be 'solved'. Both the 'problem' and the 'solution' depend on the particular situation and viewpoint taken, and are subject to continuous change.

## 6.4 A model for taking practices as a unit of design

In the empirical projects, the adjusted concepts of participatory design, prototyping and iteration were integrated with the requirements for taking practices as a unit of design summarized in Section 6.2. Five projects were conducted in which practices were taken as a unit of design. They entailed different levels of refinement of proto-practices. The set-up and results of these separate projects are presented in Chapter 7 and 8. These have been described in several earlier publications, which are summarized here together with the section numbers in the empirical chapters:

- experiments in practice (7.3.1) (Scott et al. 2011; Kuijer and De Jong 2011)
- trigger-product study (8.3.1) (Kuijer and De Jong 2012)
- try-it-out experiments (7.3.2) (Karakat 2009)
- generative improv performances (7.3.3) (Kuijer et al. 2013)
- prototype field studies (7.3.4)

All except for the trigger-product study were part of the bathing studies, exploring concepts around bathing with contained water. The trigger-product study explored person heating as part of practices of staying warm at home.

Reflection on these five generative, empirical projects helped define a general cycle for an iterative approach to taking practices as a unit of design, which is visualised in

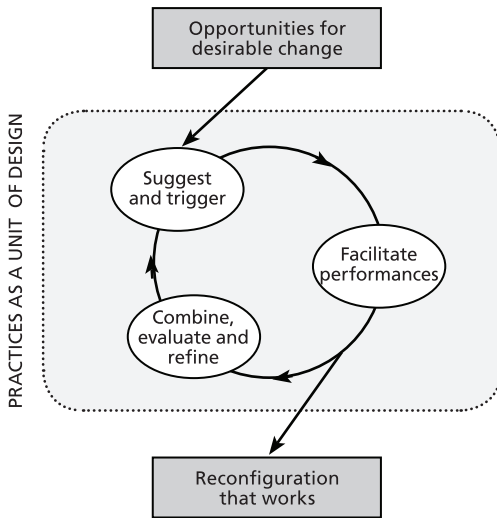


Figure 6-3 A model for taking practices as a unit of design to move from opportunities for intervention to reconfigurations that work.

Figure 6-3. The three activities in the cycle – suggest and trigger, facilitate performances and combine, evaluate and refine – are further explained below taking the perspective of the designer.

### Opportunities for change

Before going deeper into the three activities of the cycle, first a brief note on the starting point of the iteration process. In the analysis of the target practice, it was concluded that the target practice is currently not changing into desirable directions and opportunities for desirable yet plausible opportunities for intervention have been identified. In the empirical projects, these were ‘a shift from flowing to contained water (without immersion)’, and ‘supplementing space heating with more person oriented forms of staying warm’. Such opportunities form the starting point for the generative phase of the practice-oriented design process and the outlines of a first, low-fidelity practice prototype.

## 6.4.1 Suggest and trigger

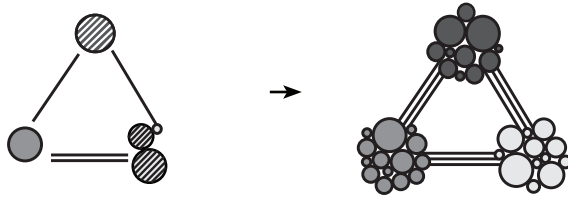
Core in this part of the cycle is preparing increasingly refined practice prototypes to be suggested to performers in a way that triggers (extensive) experimentation and improvisation. Drawing on the five generative projects, this section will first go deeper into ways of presenting practice prototypes to study participants and secondly, elaborate in triggering experimentation and improvisation.

### Suggesting a practice prototype

In the empirical projects, proto-practices were presented to participants in the form of explanations, images and artefacts. First of all, what became clear is that a predetermined opportunity or direction for change is not a requirement to start a cycle. A generative cycle can start by triggering experimentation, without suggesting a reconfiguration, which was done in the experiments in practice study. When suggestions for a proto-practice are made, the designer can choose to make them low- or high-fidelity, and to make them more or less forceful.

A high-fidelity prototype is fleshed out in detail and contains a rich description of elements and their links. A low-fidelity prototype, on the contrary, only contains a rough and vague idea of a reconfiguration. Figure 6-4 explains this difference visually.

Low-fidelity practice prototype



High-fidelity practice prototype

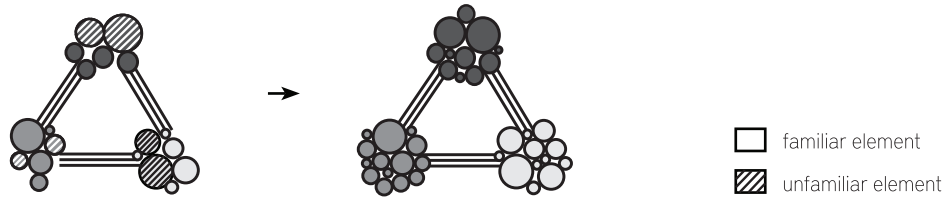


Figure 6-4 A low-fidelity and high-fidelity practice prototype that is brought into existing configurations.

However, the distinction is not straightforward. A proto-practice can be high-fidelity in some aspects, but low-fidelity in others. In case of the trigger-product study for example, participants were offered an existing product (a cherry stone pillow), including its packaging and user manual. Especially the latter were quite specific about ways of (skills) and reasons for (images) using the product (stuff), including references to other products such as microwaves and pillow cases. In this sense, the proto-practice was high-fidelity. However, interest in the study was not in the practice of person heating itself, but in person heating as part of the broader practice of staying warm at home. This relation was only roughly prescribed by asking participants to use the product as 'a way to keep warm (e.g., when working, watching TV or sleeping)'. In that sense, the practice prototype suggested in the trigger-product study can be considered as low-fidelity. Important in this respect is to note that a proto-practice does not have to contain new artefacts (product prototypes). A suggested proto-practice can involve the use of things unfamiliar to the target practice but already available 'in the market'. This use of existing products happened in the trigger-product study where participants were offered the cherry stone pillow. The try-it-out experiments study went a step further in this respect by instructing participants to (experiment with washing from a bucket and) make use of things they already had at home, such as buckets, sponges and cups. When doing this, however, as became clear in the trigger-product study, the designer has to realise that a consequence of using or offering existing products is that they are already part of existing, (high-fidelity) practices. Buckets have connected to them a set of skills, constraints and associations that may conflict with those in bathing for example.

Apart from being low- or high-fidelity, the proto-practice can be presented as an open suggestion on what the participant could do, feel, use, and why, or a more forceful suggestion. The latter can be done in terms of rules and explicit instructions on what the participant should do, feel, use, or even what not to do, feel or use. Again, the same proto-practice can contain a combination of the two. The try-it-out

experiments, for example contained open suggestions, like 'you may use [a mug to pour water over yourself]', and 'the way you [apply soap] is left up to you', but an explicit instruction was to use a bucket of water. The generative improv performances (GIP) study (Kuijter et al. 2013) contained explicit rules, in a format borrowed from improvisation theatre, like 'imagine that [splashing] is your normal way of [bathing] with which you are satisfied' and 'you cannot use [a shower hose with flowing water]'. But the foam product model used in the GIP study was deliberately left 'open'. It has to be mentioned that even the most forceful suggestion leaves space for variety in performance, and that high-fidelity prototypes aren't necessarily more forceful than low-fidelity ones. For example, participants in the GIP study did find ways to use (abundantly) flowing water and although high-fidelity, the splash prototype in the field studies (Section 7.3.4) was particularly designed to allow for a variety of ways of use and interpretations, and was indeed used and interpreted in highly varying ways.

As shown in the examples above, a specific type of instructions in these studies were instructions on how to feel. Different from studies in which ways of feeling are viewed as something to be discovered (e.g. in studies on product experience (Desmet 2005, Hassenzahl 2010)), ways of feeling in a practice-orientation are considered as part of the practice and can thus be part of the practice prototype. In the GIP study for example, participants are instructed to feel satisfied, and in the prototype field study, instructions include the recommendation to enjoy soaping your body and pouring warm water over yourself. Note that these instructions do not imply that people can be instructed how to feel; actual ways of feeling emerge only from performance. But this counts for the entire proto-practice; it is a suggestion because it is meant to be transformed in performance. Besides suggestions on what to use, do and feel, practice prototypes can also offer suggestions on what to say. In other words, any practice comes with a certain vocabulary. The practice prototype can offer suggestions for this vocabulary in the form of names of the practice, product parts and actions. In the splash projects for example, splash and splashing were unfamiliar vocabulary (for showering) that were introduced to participants through the practice prototypes, just like product parts such as a basin, a hand shower and a scoop, or actions like pouring, squeezing and soaking.

Finally, practices are carried by people. Generally, the designer is more familiar with the proto-practice than the participants are, and over time becomes increasingly so. Looking for clues about how the suggested practice is constituted, participants in the studies therefore tend to view the designer as a carrier of the proto-practice, and as a source of information about it. When in direct contact with participants, explanation of the proto-practice from own experience can be an effective way of presenting it, but the designer has to be aware of the possible effects of such explanations and the way they are offered in steering the performances. Discursive explanations are for example much more difficult to control, so the proto-practice may be presented to different participants in different ways. To prevent this, the GIP study made use of a strict, written protocol to instruct all participants in a similar way. In the prototype field studies, the experience of the author with splashing was used especially in recruiting participants. It was difficult to recruit people and talking about splashing from direct experience greatly helped to convince people to try it themselves.

## Triggering (extensive) experimentation and improvisation

In order to overcome the inertia of existing practices, a proto-practice should trigger non-everyday instances of improvisation or experimentation. Successfully triggering experimentation and improvisation is important, especially when a generative mode is required and the goal of the study is to find out *how* things could work rather than *whether* the suggested proto-practice works with the desired level of resource consumption. In the empirical projects it became clear that, as expected, extensive experimentation and improvisation are difficult to trigger. In the studies, participants were triggered through different types of tasks and settings. They included: removing essential elements or links from the current practice or problematizing it, guiding participants to take a distance from and critically view the practice they carry through self-analysis or by taking them out of their everyday contexts, and involving participants particularly skilled at improvising. Each is further explained below.

First, the setting of the study in itself triggers experimentation and improvisation. In the experiments in practice study for example, participants indicate participation in the study as a justification for uncommon behaviour. This 'acting out of the ordinary' as part of participating in a study was catalysed by the blog. Participant 9, for example experimented with not washing her hair, but expresses on the blog that 'if it wasn't for the experiment I would never dare to try something like this'. The blog also formed a particular place to express successes. In her second post Participant 3 proudly exclaims 'Jippii, I managed to have no shower this morning, just washing at the sink. And it feels good'. A remark she is less likely to have made to her colleagues at work that day.

While triggering reconfiguration has so far been suggested to entail the introduction of unfamiliar elements, the mere removal of a familiar element or link can also trigger reconfiguration. An extreme example could be to cut households from their electricity supply. It is easy to imagine that this would require extensive improvisation. The empirical studies did not involve such extreme measures, but in the prototype field studies for example, participant's regular showerhead was removed during the time of the study and in the trigger-product study, some participants were asked to turn down their thermostat by one or two degrees.

A related form of triggering is problematizing the current practice. This was done in three of the five studies by either positioning current practices as too resource intensive, or presenting the proto-practice as a 'better', less resource intensive alternative. Interestingly, in the experiments in practice study, several participants used the argument that their way of bathing was already 'sustainable' as a justification for doing non-extensive experiments. The following quotes illustrate this point.

Participant 6: 'I always have very short showers [5 min.] already so I will focus on minimizing the amount of soap/shampoo.' [note: this participant takes 9 showers per week]

Participant 16: 'I have no idea what type of experiment to do, my shower is already very short [5-12 min.] and I use environmentally friendly soap.'

These participants circumvented (extensive) experimentation by explaining how they had already (adequately) responded to the problematization suggested. What this response illustrates is a risk related to problematizing the level of resource consumption of a practice. Because it is quite common in daily life (in the form of for example campaigns trying to make people aware of environmental problems), people have developed strategies to cope with it. In the case of bathing for example, the common response to concerns about its water intensity is to reduce shower durations (and not shower frequencies). These strategies, and thus the problematization of resource intensity have, over time been integrated into the practice. In that sense, problematization of levels of resource consumption will, in many cases not be unfamiliar to the current practice and is therefore unlikely to disrupt it.

Participants can be also triggered to experiment by guiding them to take a distance from the practices they carry and view them critically. In the experiments in practice study, participants were guided to unravel bathing (in the elements of images, skills and stuff) and by tracing it back in time (through going back in their personal bathing history and through interviews with previous generations). What this comes down to is a micro scale version of the analytic model proposed in Chapter 5. However, achieving an overview and critical distance in a short time span and from an individual perspective turned out to be very difficult. As a consequence, opportunities identified from it (the experiments) tended stick to the existing practice of (daily) showering, for example by reducing the use of cosmetics or shortening shower time (see Table 7-3).

Focusing on the stabilizing effects of existing structures, another way of catalysing extensive reconfiguration is taking people out of the context their familiar routines, norms and things embedded into complex configurations that work. In the Generative Improv Performances (GIP) study (Kuijer et al. 2013) for example, participants were invited into a simulated bathroom space in a university lab. The lab was expected to form a setting where acting out the ordinary is easier than at home. However, this isolation of practices from their everyday context can also be seen as a weakness of the approach. Besides missing potentially important links with other everyday practices, GIP can only be applied to practices that can be isolated in such a way. This excludes for example practices such as staying warm because they involve a range of practices that are dispersed in time and over the home. Addressing this limitation, a possible avenue of further research may be the use of GIP in a Living Lab setting (Bakker et al. 2010), where the lab comprises an entire dwelling and performances span several days or more. Section 8.3.2 describes a pilot of such a study.

Again striving for extensive reconfigurations, the GIP study sought the involvement of trained improvisation actors. While in literature on improvisation theatre, improvisation is recognized as a general human skill (Sawyer 2000), with an important role in societal change (Frost and Yarrow 1990), this literature also makes clear that improvisation is not easy to do, and that skills of improvisation can be enhanced through training. Seham (2001) summarizes these skills as 'a mixture of "making do" and "letting go"'. Making do refers to skills of 'using bodies, space all human resources, to generate a coherent physical expression of an idea, a situation, a character' (Frost and Yarrow 1990) while 'permitting everything in the environment (animate or inanimate) to work for you' (Spolin 1999), and letting go to the ability to 'free oneself from socially accepted frames of reference and



assumptions of expected behaviour', to 'focus on the process and suspend judgment of the outcome' (Vera and Crossan 2004). Trained improvisation actors are therefore particularly skilled at forming extensive reconfigurations of practice through bodily performance. It has to be noted that involving improvisation actors also has limitations, especially in the practical sense of finding willing participants both familiar with the target practice and trained to improvise.

## 6.4.2 Facilitate performances

When taking practices as a unit of analysis, performances turned out to be central. This observation clearly resonates with for example the work of Scott et al. (2011) in their paper titled 'Designing Change by Living Change'. In the approach they are viewed as the locus of where suggested, desirable proto-practices are rearranged into configurations that work. Important tasks for the designer in this part of the cycle are facilitating a variety of performances and documenting these performances for the next phase.

### Facilitating variety

Variety in performances can be achieved on two dimensions: through recruiting various participants and by having each participant perform several times. These two dimensions of variety are presented in Figure 6-5. In the studies, numbers of performers varied from two to sixty, and numbers of performances per participant from one to fifteen.

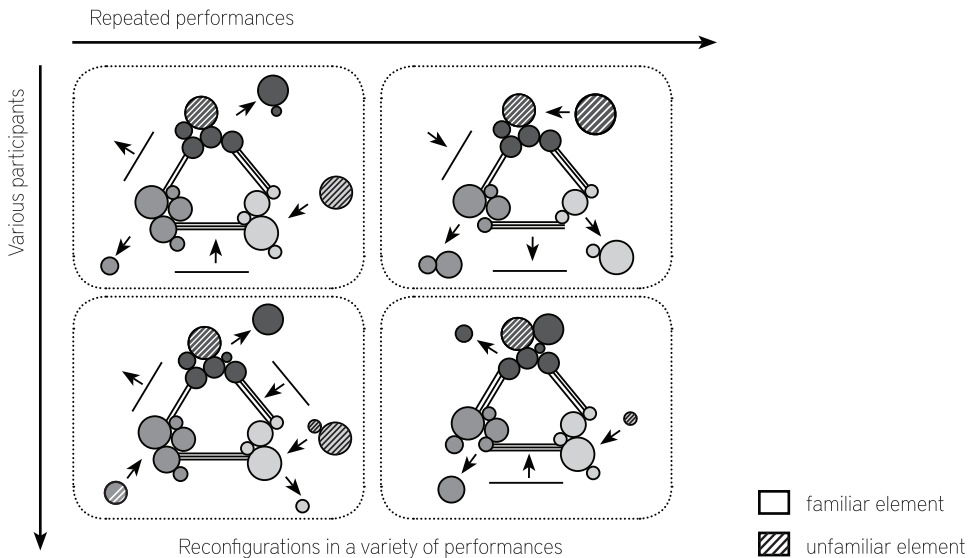


Figure 6-5 Variety in performances on two dimensions.

Repeated performances by the same participant allow for fleshing out of the reconfiguration by trying different alternatives and recruiting a variety of additional elements into it. Participants reflect on their performances and adjust them to make them work. For example, one of the participants in the prototype field studies explains how she made splashing work for herself:

‘at first I thought what to do with this strange object in my bathroom, but then I saw him [her son] enjoying it and I started to play with it as well. You have to cross that line at first, but then you play with it and try it out, and then you can develop a way that works for you. That takes some time.’ (Astrid)

Repeated performances also allow for less deliberate bodily and mental learning processes to take place. In the experiments in practice study for example, Participant 9, whose experiment is to stop using shampoo, explains how her hair at first got so greasy that she doesn’t dare going out anymore without covering it. In the second week, it starts to become ‘really ok’. Her hair becomes less greasy and when she wets it, it now feels ‘a bit smooth’. And Participant 3, who switched from shampoo and shower gel to ghassoul (a mineral soil for washing), explains that she got used to the different feeling over time: ‘First I still felt dirty after the shower, but now it is feeling normal’. Apparently, this learning (and unlearning) happened over the course of less than a week.

Because different participants have access to different ‘libraries’ of elements and links that can be integrated into the reconfiguration, the more different the backgrounds of the participants, the more different the libraries available to them. Something else that differs between participants (even when carriers of the same practices) is the kinds of configurations that will (or will not) work for them. Diversity between participants can be increased by recruiting for high variety in types of performers. It is however difficult to judge how performers will be different and much depends on the practice. While for example recruiting participants with different cultural backgrounds turned out to be helpful the GIP study, it also became clear that participants who seemed very similar in terms of socio-cultural background, like for example Bas and Anton in the prototype field studies, can have very different ways of performing and responses to the proto-practice. In a practical sense, because it has been difficult to find participants at all in most of the studies, being selective was hardly possible.

High variety in performances is desirable in the earlier cycles of development of the proto-practice. In later cycles, coherence and the creation of a shared practice is more desirable. As a general rule, few performances by many participants result in greater variety than many performances by few participants. Therefore, later cycles in the process benefit from fewer participants performing more often.

### Documenting performances

For the designer, a challenge lies in documenting performances in a way that is valuable for further development of the proto-practice. Challenges are similar to those of studying existing household practices as described in Section 5.4.1., but there are also differences. Ways of documenting performances in the empirical projects are discussed according to the three main sources of information about practices explained in Chapter 5, being

bodily performances, practitioner’s rationales and material artefacts. Again, the focus is on accessing the (proto)-practice-as-entity.

Compared to analysis of current practices, detailed information about single performances of the proto-practice is much more important. The reason is that in the case of proto-practices, there are relatively few performances, so each performance represents an important share of the practice-as-entity. The challenges of observing performances are mostly the same though. Bathing is performed in private and therefore difficult to film, and staying warm at home is strongly dispersed in time. Therefore, the designer has to primarily rely on participants’ accounts in interviews. A helpful difference is that these performances are not (yet) routine, and therefore tend to be remembered in more detail by participants. Like in the analytic studies, a tool used to support memory were diaries. The try-it-out experiments study, for example, asked for a detailed process description, offering an example of brushing teeth in fourteen steps. The trigger-product workbook offered a table to fill in detailed actions and times. While workbooks were filled out rather diligently – most workbooks in the trigger-product study contain at least a couple of entries in the table, and some even drawings (Figure 6-6) – they were always combined with interviews. In the interviews, participants were questioned at length to uncover exactly what they did in their performances in as much detail as possible using strategies similar to those described in Section 5.4.2.

In several studies, documentation went beyond self-reporting and discursive interviews. In case of the Generative Improv Performances (GIP) study (Kuijter et al. 2013), it was possible to film performances because of the lab setting and the fact that participants were dressed. In the trigger-product study, post-interviews were videotaped and participants were asked to re-enact several scenes from their performances. Finally, the water logger used in the second prototype field study provided detailed information

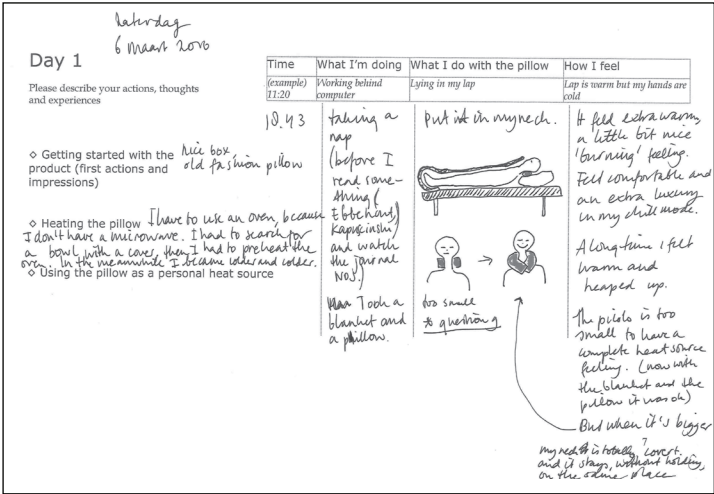


Figure 6-6 Example of documented actions in a trigger-product workbook (Participant 4: Blokhuis and Bothun).

of a particular aspect of the performances that helped obtain an image of performances without being too intrusive.

Compared to current practices, rationales related to proto-practices were easier to access because it was easier for the interviewer to adopt the role of a novice. In further stages of the research however, the role of novice became more difficult to keep up. In the field studies for example, participants viewed the author as an expert practitioner. In such cases, it turned out to be useful to ask participants how they would explain the proto-practice to an outsider or how they compared the proto-practice to the target practice. Another way of collecting data on the rationales and positioning of the proto-practice was by documenting exchanges between participants. This was for example done in the experiments in practice study, where participants could communicate on a blog and came together in a joint workshop.

A third source of information was formed by the material settings of the performances. Participants were asked about the things they used, and what things they didn't use but would like to use. In the try-it-out experiments they were asked to take photos and make drawings of the settings of their performances and in the trigger-product and prototype field studies, these settings were directly observed and documented by the designer (Figure 6-7).

A particular material aspect of the proto-practice was that resource consumption per performance required documenting. In the experiments in practice and try-it-out studies, participants were asked to self-report their water consumption. The trigger-product study did not quantify resource consumption. In the GIP study, no actual water was used, but imaginary consumption was estimated on the basis of analysis of the videotaped performances. In the prototype field studies, aggregate water consumption was measured and later water consumption per performance for the basin and hand shower were logged separately.



Figure 6-7 Pictures of material settings from the try-it-out experiments (Karakat 2009), trigger-product study (picture: Marsman and Kwon 2010) and the prototype field studies. (FamA) .

### 6.4.3 Combine, evaluate and refine

The redesign entails combining all different performances, taking each as valid and designing a configuration of elements that allows for the widest variety of performances, a type of open design.

#### Combining performances

The first step in analysing the set of performances collected in the previous step is to, if the level of detail in data allows, describe each performance separately in a corresponding format. Except in the GIP study, where each performance was filmed separately, what turned out in the studies to be realistic however, was to describe the aggregate of performances for each participant into the form of a coherent proto-practice (Figure 6-8). Such a format can be a table, a narrative or in case of the GIP study, graphical overviews.

The next step is to get an overview of the ranges of variety that occurred by selecting a number of variables on which similarities and differences in the performances can be described. Variables can be sought in what was done, used and felt, in rationales for doing and feeling, in the amount of resources consumed and so on. This can be in the form of discursive descriptions for a number of themes as in the trigger-product study for example, or in the form of a table as in the GIP study.

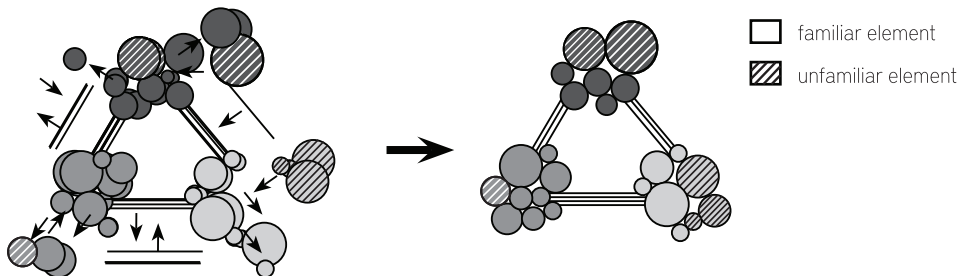


Figure 6-8 Grouping a variety of performances into a coherent proto-practice.

Because variety reduces with advancing cycles of practice development, grouping and comparing performances becomes easier. In the experiments in practice study for example, experiments differed strongly and some varieties were performed by one participant only. In this study, performances were grouped into five different strategies for reducing resource consumption. Some containing several varieties, such as washing from the sink and washing from a bucket. In the splash field studies, variety between performances was also high, but on a different level.

#### Evaluating performances

In the empirical studies, performances were evaluated on two main aspects: do they work (or have potential to work) and do they have the desired level of resource consumption. Situated within the context of sustainable design, the practice-oriented approach is clearly normative, meaning that it harbours a clear idea of more and less desirable directions for

change. However, its foundation in practice theory also means that judgement of whether a performance works emerges from performance, so judging whether a practice works can only be done in performance.

A reconfiguration that works is repeatable beyond the specific situation of single performances, i.e., it has potential to become more widely reproduced and recruit well. However, if a reconfiguration is rejected after performance as not repeatable, or even before performance, this does not necessarily mean that it doesn't work. It means that it does not work in that situation. Therefore, judgments whether the proto-practice works become more reliable when it is integrated more in daily life and performed more often. Conversely, if a proto-practice works in a certain situation and is thought to be repeatable by the participant, this does not necessarily mean that it will work beyond that situation. In brief, the designer has to realise that whether a reconfiguration works depends on who is asked what, when, where and how.

Nevertheless, if a proto-practice is performed repeatedly by a participant and evaluated positively, this can be considered a strong indication that it works for this person. If there are several people who evaluate the proto-practice positively after repeated performance, this is an even stronger indication that it could work as a practice. However, as long as the practice does not become a normal way of doing for a considerable group of people, the questions whether it works cannot be answered. As long as it has not spread widely, it therefore remains referred to as a proto-practice. In any case, a practice never works for everyone indefinitely, so whether a practice works always requires the disclaimer of 'currently' and 'for those who regularly perform it'.

Judging the level of resource consumption involved in performances can be done by the designer by comparing the (estimated) level of resource consumption to the target level set in the analytic phase. As became clear in the staying warm projects, what can also result is an indication of clearly undesirable directions in which the practice could develop as a consequence of an intervention.

### Refining reconfigurations

Based on the evaluations of the performances, refinement of the proto-practice focuses on ways in which participants judge it not to work for them, and by focusing on those performances with lower resource requirements.

To be clear, refinement of the proto-practice is about more than addressing dislikes or inhibiting undesirable directions through adjustments in technologies. Although this strategy is the first response of a product designer, a practice-oriented approach expands the unit of design to practices, thus involving not only stuff, but also skills and images. Consequently, a proto-practice does not necessarily involve the introduction of new stuff at all; it can be merely adjustments to images and or skills, facilitating or inhibiting the making of links, or even involve the removal of things from existing configurations. From the performances in the bathing studies it became clear that it (splashing) was by some participants experienced as slow or a hassle, while others found it relaxing and particularly appreciated the deliberate body care it entailed. In the refinement of the proto-practice, these latter qualities were emphasized in the visual, physical and discursive presentations of the proto-practice to new participants. What also emerged from these studies is that along with new skills and stuff involved

in the configuration (such as pouring, scooping, scoops, seats and basins), splashing required a new vocabulary. This new vocabulary was offered to participants in the form of written and discursive instructions and descriptions of splashing.

Additional strategies for refining a reconfiguration to make it work used in the empirical projects were allowing for variety and allowing for learning processes to take place. In each study, high variety was found between performances, sometimes differing diametrically. For example, some participants particularly appreciated the possibility to sit down while splashing, while others particularly rejected the idea of sitting. Acknowledging both these judgments as valid, splashing allows for use in both sitting and standing postures. Another observation was that compared to showering, splashing requires different bodily and mental skills, such as ways of setting the right water temperature in the basin, managing the clearness of the water in the basin, enjoying the feeling of splashes of water on the body, getting used to sitting down naked, managing body temperatures. These bodily and mental skills require time to be learned. Instead of making the practice instantly optimal in terms of use experience, the design is such that it attempts to allow for learning to take place over the course of subsequent performances.

All these refinements are aimed at making the proto-practice work. However, even though the designer becomes increasingly skilled at making predictions about whether configurations would work or not based on earlier experiences, whether a refined reconfiguration works and has desirable levels of consumption can eventually only be judged through (repeated) performances. Therefore, as a next step, the refined proto-practice is prepared to be fed back into another round of performances.

Through a series of iterations, the process thus evolves from a focus on triggering and disrupting current practice, to incubating potential reconfigurations, to scaling up these reconfigurations to form a desirable reconfiguration that works. However, even then the designer is not finished. Because practices are constantly changing, they may again move in undesirable directions requiring another designed intervention.

## 6.5 Conclusions

The aim of this chapter was to provide an answer to the question 'What does it mean to take practices, instead of interactions as a unit of design in sustainable design?'. As in Chapter 5, the recommendations made above form a possible answer to the methodological aspect of this question. From these recommendations, it becomes clear that the generative activities in a practice-oriented approach differ from those in an interaction-oriented approach in a number of respects. Basically, these differences are captured in the questions lying at the basis of the two design approaches. While in interaction-oriented approaches the question is 'how to motivate, persuade or steer people to adopt sustainable behaviours through product interventions?', the question at the basis of a practice-oriented design process is 'what could be less resource intensive reconfigurations that work?'. Consequences of this difference can be explained starting from the contradiction, illustrated in Figure 6-9 that in practice-oriented design intervention in practice is a starting point of the process, and a desirable reconfiguration of the target practice an outcome, while in interaction-

### Interaction-oriented design



### Practice-oriented design



Figure 6-9 Differences in starting points and outcomes of the design process.

oriented approaches, a certain vision of ‘sustainable behaviour’ is the starting point and an intervention in practice (also referred to as a ‘solution’) the outcome.

First of all, this difference says something about where the locus of design activity is viewed to lie in both approaches. When broadly defining designing as the creative act of generating what could be, as opposed to what currently is, the practice-oriented approach proposed in this thesis views performances as the place where ‘designing’ happens. It thus acknowledges that an intervention in daily life requires redesign of the existing practice and web of practice it is part of. In the interaction-oriented approach, ‘designing’ is viewed as something that happens as separate from daily life. A consequence of this difference is that in practice-oriented design, the intervention is disruptive and deliberately intended to lead to a non-standard, challenging situation in which extensive reconfiguration is required. In interaction-oriented approaches on the contrary, the designer strives to make the intervention as ‘smooth’ as possible to make it ‘fit’ into existing configurations. The difference between a disruptive and a ‘smooth’ intervention is that the first does not intend to ‘work’ immediately. Another difference lies in what is designed. In interaction-oriented approaches, specific ideas of ‘good’ or ‘sustainable’ behaviour form the point of departure for the design process, while in the practice-oriented approach, reconfigurations are viewed as something that emerges from the design process. In this process, the designer takes the role of facilitator and catalyser.

This difference between ‘sustainable behaviour’ and desirable reconfigurations or directions for change incorporates another important difference between the approaches. The static idea of behaviour, incorporated in the term sustainable behaviour directly relates to the pursuit for optimization prevalent in interaction-oriented sustainable design. This pursuit is criticized in the more general area of user-centred design by Redström (2006). Observing a tendency to optimize fit between object and user, Redström expresses the concern that ‘to fit means to fit something at the expense of something else’. Combined with the idea that practices are internally differentiated and dynamic, optimization of a design towards one scenario narrows the appropriateness of the design for other scenarios. Or more strongly, investing in one particular, optimal scenario will correspond with few or even no actual performances. However, there is another, more harmful downside to this endeavour for optimization. As Redström states:



'As the possibilities for alternative interpretations are systematically reduced as a result of the designer's attempt to optimise the design with respect to fit, the room for finding our own solutions, possibly coming up with interpretations that are more interesting than the original intent, is reduced to a minimum.' (Redström 2006: 135)

Combined with the rhetoric of 'good' and 'bad' behaviour, these designs have the risk of imposing (a term used by Jones (1988)) upon people certain forms of conduct that are determined unilaterally by designers. Moreover, combined with the pursuit of ensuring a fit to existing attitudes and norms, these forms of conduct are based on an existing, arguably undesirable, status quo. On the contrary, practice-oriented design does not invest in optimal scenarios. A practice-oriented approach strives for a form of open design in which variety and change over time are facilitated. Similar to the idea of 'match just enough' proposed by Zakkas et al. (2011), it seeks a 'balance between anticipating and steering an experience, and leaving free space for open interpretations, aberration and subversion'.

To illustrate this rather theoretical account, Chapters 7 and 8 illustrate how the practice-oriented approach proposed in Chapters 5 and 6 can result in suggestions for reconfigurations of resource intensive practices towards strongly less demanding forms that have potential to work.