Introducing and Developing Practice Theory – Towards a Better Understanding of Household Energy Consumption

Kirsten Gram-Hanssen
Danish Building Research Institute
Aalborg University, Denmark
kgh@sbi.dk

A household's energy consumption is an important element of sustainable everyday life. It is therefore relevant to understand and explain the daily routines and use of technology that are intimately linked to energy consumption. This paper introduces a recent practice theory from Schatzki, Reckwitz, and Warde that has been put forward as a promising framework to explain everyday life consumer practices. The practice theory is, however, not a commonly agreed upon theory but is regarded more like an approach or a turn within contemporary social theory. When using practice theory in studies of everyday life, there are several conditions that need further clarification. In this paper, the focus will be on the question of how to include technology in practice theory and how technology contributes to both change and stability in practice. In the paper, Schatzki's practice theory is described in detail and, based on Reckwitz, is afterward extended with discussions of different socio-technical approaches, including appropriation and domestication of technology, transition theory, and scales of technology. The paper discusses practice theory and how it can be used to understand the role of objects and technologies in the constitution and change of routines and practices related to the use of everyday-life technologies, as it is by using these technologies that energy is consumed in the homes.

Introduction

This paper aims to get a better grasp of the daily routines and practices that are done in households and that have as a secondary effect the consumption of energy. In the past decades, quite a lot of research on household energy consumption has been carried out both from a cultural consumption perspective and from a socio-technical perspective. It has been argued that there is a general tendency within cultural consumption to overstate the conspicuous consumption approach in favour of focusing more on routine consumption practices (Gronow and Warde, 2001). Following this criticism, Shove showed in her influential book how new norms and higher standards of comfort, cleanliness, and convenience are constructed, along with the introduction of new technologies, and how these shifts have a huge impact on household energy consumption (Shove, 2003). From a more theoretical perspective, we have at the same time seen what some call 'The practice turn in contemporary theory' (Schatzki, Cetina and Savigny, 2001) and, as both Shove and Warde have pointed out, this might be highly relevant to getting an understanding of consumption. According to them, the quality of practice theory is precisely that it stresses the routine aspect and the collective and conventional nature of consumption (Warde, 2005) and that it stresses the importance of the role of the artefacts involved in constituting new practices (Shove and Pantzar, 2005).

In this paper, I intend to follow and develop this line by exploring the content and ideas of practice theory as they are developed by Schatzki (Schatzki, 1996, 2002). First, I will give an introduction to the theories of Schatzki with a focus on the different elements and links that he proposes. Next, I will propose ways of extending the practice theory of Schatzki to better include the material - e.g., things and technologies – as discussed especially by Reckwitz (2002a, b). In this proposal for an extension, I will concentrate on three aspects: how people relate to and domesticate technologies, how new practices evolve in a co-production with new technologies, and finally how questions of infrastructure, scale and systems of technologies can be understood in practice theory. In the last section of the paper, I refer to examples on how practice theory can be used in empirical analysis.

Practice theory – in the words of Schatzki

What is practice theory?

In the introduction to "The practice turn in contemporary society," Schatzki emphasises that there is not one common understanding of what practice theory is, but that there are many different contributions originating in philosophy, social science, cultural theory, and science & technology studies (Schatzki, 2001). What they have in common is that practice theories place practices at the centre of the understanding of the social where other theories may emphasise actions, language, system, or structure in their definition of the social. Practice theory is thus not just a theory of practice; it is actually a challenge to the understanding of cultural and social theory up till now. The most coherent and developed contribution to practice theory comes from Schatzki, and even if he is one of the contributors to practice theory who put less emphasis on the role of things and technologies in practice (Reckwitz, 2002b), I will start by introducing concepts from Schatzki's work. The following builds on his latest book on practice theory (2002), where, in addition to new contributions, he repeats, develops, and defends his own work in 1996.

Schatzki sums it all up: "a practice is a temporally evolving, open-ended set of doings and sayings linked by practical understandings, rules, teleoaffective structures, and general understandings. (…) the organization of a practice describes the practice's frontiers: A doing or saying belongs to a given practice if it expresses components of that practice's

organisation" (Schatzki, 2002, p. 87). In the following, I will explain and develop the content of this quote, and I intend to illustrate the concepts with examples from energy-consuming everyday practices like washing clothes and regulation of indoor comfort.

What are practices?

The basic element of a practice is bodily doings and sayings, and, as a comment on the linguistic turn in recent decades, Schatzki emphasises that the doings are as important as the sayings (p. 77). The context of the doings and sayings is important as both doings and sayings can change meaning according to context. A practice is a set of doings and sayings, and as a way of understanding and describing these sets, Schatzki introduces a hierarchy with *doings and sayings* at the basic level, and with collections of sayings and doings forming a level of *tasks*, which, in turn, at a higher level with several tasks, can form *projects*. He explains that different sayings and doings can often form the same task. If the task is to dry washed clothes, for instance, this can obviously be done in different ways: for instance, either by using a tumble dryer or a clothes line. The same is true for the level of projects. If we consider clothes washing as a project, this can obviously also consist of many different tasks and sayings and doings like deciding what to wash, telling teenagers to clean their room for dirty clothes, sorting the clothes, putting it into the machine, etc. A practice thus embraces a set of hierarchically organised doings and sayings, tasks and projects, and the participant in any given practice will normally carry out actions at all three levels. Furthermore, practices need not be regular; they can comprise occasional, rare, or novel sayings and doings, tasks, and projects. Buying a washing machine, for instance, is part of the washing practice; however, it is a doing that is much rarer than the doing of filling the machine with clothes. Practices are social and by performing a practice you coexist with not only those you interact with (for washing practices, primarily other family members), but also with all other people performing this practice, e.g., most people in western societies share washing practices.

What guides practices and individual activities?

Activities by individuals are guided by practical intelligibility, which is basically what makes sense for the individual person to do. Thus practical intelligibility is an individual thing, and the way it guides certainly does not have to be in the most rational or normatively correct way. When interviewing people on how they regulate their indoor climate, you can get very different views of how thermostats work and what is healthy or not, as related to indoor climate (Gram-Hanssen, 2010a). Some, for instance, argue that it is unhealthy to keep a high indoor temperature or that airing a room is a matter of showing control and personal strength. And some argue that it is easier to air a room if one keeps a high temperature. The question of whether these ideas in a scientific understanding can be called true is secondary; what matters is that it actually guides individual practices. People do what from their practical intelligibility makes sense for them to do.

In contrast to individual activities, practices are collective and need collectively shared links to hold together the sayings and doings. Schatzki proposes four links of what holds sayings and doings together in practices:

- Practical understanding
- Rules
- Teleoaffective structures
- General understandings

Practical understanding is about knowing what to do and knowing how to identify and react to something. It is a capacity underneath the action; however, it does not determine the action.

Practical understanding carries out those acts that practical intelligibility singles out. Using the indoor climate as an example again, I understand practical understanding as the bodily knowhow of actually regulating the heating and ventilation systems, that is, turning the valves and opening and closing windows and doors.

By *rules* is meant explicit rules of how to do things, what is allowed and what is not. Thus, this does not include tacit or implicit rules. Again, with heating as an example, some neighbourhoods with shared district heating systems might have written rules of how to handle the system – for instance, in relation to payment and maintenance or in relation to what the temperatures should be in summer and winter.

Teleoaffective structures, a compound term made up of teleological and affective, is about being goal-oriented, where the goal is directed by normative views or moods. To illustrate this, I think norms of cleanliness and how these norms are part of holding washing practices together is a good example. Teleoaffective structures are not individual-based like practical intelligibility; instead, they are properties of practices. This means that a person does not have to be aware of the teleological end of a practice to take part in the practice. When individuals explain their washing habits, they do not refer directly to cultural understandings of what is clean and what is not. Their actions, however, will most probably follow the general norms. The practice thus contributes to the construction and reproduction of the teleoaffective structure, which at the same time also takes part in the linking together of sayings and doings into practices. Teleoaffective structures do not govern individual activity, as this is governed by practical intelligibility. The practical intelligibility, however, is also formed during the learning processes of how to carry out the practices. It then follows that the normativity in the teleoaffective structures of a practice does shape what makes sense for people to do. Furthermore teleoaffective structures and the ends, tasks, and projects that they guide are open-ended and subject to discussion and contention.

As examples of the *general understandings,* Schatzki mentions religious and communitarian understandings. The general understandings are thus commonly shared beliefs, enterprises, concerns, or fates. As an example, I think the idea that "taking care of the environment is a good thing" is a common understanding shared by most people in Denmark (and probably in most western societies). Exactly how this should morally influence practices, however, is a question that there is much less agreement about. Schatzki, however, does not provide much knowledge of this fourth aspect of what links together practices, even though this fourth element was not part of the theory in Schatzki's first book, where he only describes the first three elements that hold together practices (Schatzki, 1996:89) It is not mentioned either in a 1997 article by Schatzki (Schatzki, 1997). In these older descriptions from Schatzki, it seems as if the general understandings are part of the teleoaffective structures.

Integrated and dispersed practices and their delimitation

Practices can be differentiated into integrated and dispersed practices. Integrated practices are those that get the most attention in practice theories and they are the most complicated in the sense that they consist of more elements and specific organisations. Examples of integrated practices with relation to energy consumption in households are cooking practices, washing practices, communication and entertaining practices, whereas examples of dispersed practices are asking, describing, and the practice of turning a switch or a tap on or off. As seen in these examples, dispersed practices are elements in the integrated practices, in such a way that many different dispersed practices can be part of the same integrated practice, and that any dispersed practice can be part of a multiplicity of different integrated practices. It is important to mention that simple dispersed practices are not guided by all four elements but usually only by a practical understanding, as they are most often both free of rules and not governed by

teleoaffective structure. Actually, it is exactly because of the absence of these structures that it is possible for the dispersed practices to work in such different types of settings.

A particular doing or saying, or a dispersed practice, might be part of not only one but several practices and the same is true for a given organisational component. So, how does one distinguish one practice from another? The delimitation is given in the understanding of a practice as a set of doings and sayings linked by practical understandings, rules, teleoaffective structures, and general understandings. This means that what practices exist is an empirical question of the actual existence of such packages. The same holds true for the question of who is member of a practice. This is not a normative question but a factual one of who is actually following the norms of what is obligatory or acceptable to do and say.

Practice theory, artefacts, and technology

As Schatzki writes in the introduction to "The practice turn in contemporary theory", one of the things that divide scholars who consider themselves as part of practice theory, is the question of what role things, technologies, and matter should have in the theory. Most would agree that things are an important element in most practices. However, for some of the theorists, this is regarded as mediators between primary social relations, whereas the post-humanists will argue that non-humans take a role in their own right (Schatzki, 2001). Schatzki is obviously not part of the post-humanistic turn himself, and he is explicit that what he calls activities are human activities and what can be called nonhuman agency belongs to social orders (the result of the practices) and not practices in themselves (Schatzki, 2002). However, in this paper, I am interested in that part of practice theories, which in a more profound way, takes in things and technologies as essential in the understanding of household energy consumption. For this purpose, I will in the following section introduce the work of Reckwitz who argues for an elaboration of Schatzki's theory by bringing in the work of Latour's symmetric anthropology. Actually Reckwitz writes that not only does he think that such an inclusion of Latour in Schatzki's work is possible; he thinks it is required and, furthermore, he thinks it can help to make Latour's work more understandable (Reckwitz, 2002b).

Reckwitz: bringing Latour into the theory of Schatzki

In his article, Reckwitz is searching for the status of the material in different approaches of cultural theories. He divides cultural theories into three different (historic) periods and discusses how the material has been thought of in each of these periods (Reckwitz, 2002b). The first period is the sociology of knowledge, including Manheim, Scheler, and Durkheim, and Reckwitz argues that the way the material is thought of here is as social structures. The second period includes all of the cultural turn in social sciences, as for example, (post)structuralism, semiotics, constructivism, and social phenomenology. Though there are big differences in these understandings, they share the view of the material as something that only exists as carriers of meaning and objects of knowledge. Reckwitz admits the general merits of these cultural approaches; however, at the same time, he also asks for a less intellectual understanding of the material. This understanding, he writes, should first be able to see human activities with things as something that is not just related to other subjects or structures; second, to understand that social order is also a product of socially stable artefacts; and third, to see social change as following from a change of artefacts. And Reckwitz argues that the best place to look for such insight is to go to Latour, as this is where we get the things and artefacts into the theory without falling back into the materialist-idealistic approach of knowledge sociology.

The symmetric anthropology of Latour is an attempt to understand the link between the cultural and the material without having a constitution one way or the other (Latour, 1993). The material is neither the basis of the cultural nor a matrix of symbolic objects; it is artefacts

taking part in social practices in line with human beings. Latour tries to develop his own language on this, and central concepts are networks or practices, hybrids, and nature-cultures. However, in Reckwitz's opinion, this language is never fully developed into a social theory, and it has problematic elements such as the claimed status of objects as actors in their own right (Reckwitz, 2002b). Rather than elaborating on Latour's work, Reckwitz, however, wants to insert Latour's ideas into the practice theories.

So what does Reckwitz bring with him from the Latourian approach? If we look at what Latour calls historically specific nature-cultures, we see that they consist of different social networks or practices, including not only human beings and their relations, but also things that are seen as equal components in the constitution of the practices. Especially in contemporary society, with its enormous expansion of technical artefacts, it becomes increasingly difficult for a social theory to overlook how things take part in the constitution of social practices. Related to my subject, one can imagine how difficult it would be to understand washing and cooking practices without considering washing machines and refrigerators. Latour (1993) talks of the hybrid status of things: on one hand, they are socially and culturally handled and interpreted, but, on the other hand, they are definitely also more than just cultural representations as they are used and have an effect on their own.

Reckwitz (2002b) uses part of these understandings from Latour and writes that in their materiality and in being handled and produced, the objects or things are a necessary and irreplaceable part of creating and holding together practices. Furthermore, they make social reproduction possible beyond temporal and spatial limits. Things act as resources that can both enable and constrain practices, and they can work as instruments that do not only transmit messages but also mould both the form of the message and the type of communication. Thus, social change may also strongly depend on changes in the technical media. On the other hand, things or technologies do not determine specific activities. To have an effect, things must be used, and they can only be used if those using them have the knowhow, understanding, and interpretation of the thing – thus, the relation between the thing and the human agent is basically a relation of practical understanding, where the human agent learns to know and use the thing and this knowledge materialises within the practice. In this way, things can also be seen as materialised understandings and that not only bodies but also things are sites of understanding. Reckwitz sums up that "Social order and reproduction can be adequately understood only when we realize their double localization: as understanding incorporated in human bodies and as understanding materialized in artefacts." (Reckwitz, 2002b, p 213), Also, Reckwitz echoes Knorr Cetina and writes that, in this way, actions between human beings lose their omnipotence as they are joined by equally important actions between humans and non-human artefacts (Knorr Cetina, 1997). However, Reckwitz does not agree with all aspects of Latour's symmetrical anthropology. In his view, artefacts only have an effect insofar as they are handled by human agents, which is the reason their importance cannot be the same or equal that of human bodies and their embodied understandings.

Though Reckwitz is doing a good job in incorporating things and technology in practice theory, there are aspects of the technologies' role or place within practices that I think need to be further explored and discussed. As I am working with practices related to household energy consumption, I am interested in the relation between users and the individual appliances in everyday life as well as the users' relation to the whole energy system. Furthermore, I am interested in both the stability and the change of routines. In the following, I first want to introduce theories that emphasise the large technological systems and the inertia that these kinds of systems impose on practices. Then, I will focus on how new practices emerge in co-evolution with new artefacts. And finally, I will focus on the relations between the user and the technologies and the processes of domestication and appropriation.

Large technological systems, transitions, and the physical infrastructure

Bas van Vliet has written a PhD thesis on the greening of the grid and I will use part of his work to pin down some of the main aspects of how physical infrastructure influences and relates to household consumption (van Vliet, 2002). Large integrated technological systems are, for instance, grids that are built for the purpose of delivering a specific commodity to its costumer. It can be the electricity grid or the district heating or gas pipes and it delivers a uniform, continuous, and mainly invisible product to its end-users, who seldom has any choice as there is only the same network and as products are essential for basic practices within the household.

In understanding how this type of big technological systems with many single artefacts and actors has come into existence, van Vliet refers to the work of Huges (1983) who studied the evolution of electricity systems between 1880 and 1930, as well as to other studies and traditions within technology studies. One of them is the technological transition theory, and it can, in many respects, be seen as bringing some of the most relevant aspects of the other theories together, which is why I will concentrate on this in the following section.

Technological transitions are big technological changes in the societal organisation of, for instance, housing, transport, communication, or production. Technological transitions are changes not only in technologies but also in the social network surrounding and sustaining these technologies. Technological transitions therefore do not easily break through. However, as history has shown, they do happen. Transition theories, as described by Kemp and others (see, for example, Rip and Kemp, 1998; Kemp, Loorbach and Rotmans, 2006; Gells, 2002), focus on both the inertia and the changes and in doing this they build on a long tradition from science and technology studies. Basically, transition theory works with a multilevel framework consisting of three levels: niches, regimes, and landscapes.

The metaphor of landscape is chosen because it refers to a material and hard structure, which is very difficult to change, and the landscape level works as the context and structure of all interactions between actors. The landscape level includes, for instance, the physical infrastructure as well as the legislation and deeply rooted ethical norms of society. "The Socio-technical landscape is a landscape in the literal sense, something around us that we can travel through; and in a metaphorical sense, something that we are a part of, that sustains us" (Rip and Kemp, 1998:334)

The notion of regimes comes from evolutionary economics where it focuses on how engineers working to develop new technologies follow technological trajectories, because they are locked in certain ways of thinking about and doing things. In transition theories, the idea of regimes is extended to include a more sociological understanding of "rules" (Geels, 2002). "A technological regime is the rule-set or grammar embedded in a complex of engineering practices, production process technologies, product characteristics, skills and procedures, ways of handling relevant artefacts and persons, ways of defining problems, all of them embedded in institutions and infrastructures" (Rip and Kemp, 1998:338). Among some theorists, the understanding of regimes is further extended to include more actors, as users, policy makers, societal groups, suppliers, scientists, capital banks, etc. Following this broadened understanding of technical trajectories, Geels use the word *socio*-technical regimes rather than just technological regimes to refer to this meso level of the model (Geels, 2002). Developments at this level follow the line of already known ways of doing things; they follow technological trajectories that are built into routines, knowledge structures, organisations, and physical structures. The regime level thus counts for stability in the way, for example, technologies, knowledge, and organisations develop. And as van Vliet writes, "Technological trajectories seem nowhere as evident as in circumstances of fixed networks, where large-scale investments have accumulated over the years and physically impede changes or alternatives to the basic features of the system" (van Vliet, 2002:35)

The niche is the most crucial level in relation to technological transitions as this is where radical changes are able to develop in a small scale in isolated or protected environments (e.g., the army) and then later eventually transferred to the regime and landscape levels if, for a different reason, these show openings or tensions (Rip and Kemp, 1998). The three levels of landscape, regime, and niche form part of a hierarchy, where the lower levels are dependent on the higher levels and changes in niches thus also depend on the configuration in regimes and landscapes. However, Geels criticises this strong focus on the niche level as the only place where radical changes happen. By using a case study on the transition from sailing ships to steam ships, he argues that an accumulation of niche developments, together with changes in landscape and regime levels, provides a better understanding.

Following this line by using concepts of transition theories but criticising the understanding that novelties always develop in niches and spread from here, Shove has studied how practices of comfort, cleanliness, and convenience have co-developed with all three levels of technologies (Shove, 2003). Shove shows that transitions have to be understood both as bottom-up (from niche to landscape) and top-down (from landscape to niche) processes, as well as on a vertical level where 'systems of system' develop - e.g., washing practices being dependent on systems of washing machine technologies as well as on systems of new fabrics. And while practices and (systems of) technologies have co-evolved, expectations and norms of what a normal life should be like have changed in a rather unsustainable way.

New practices – new products

The socio-technical approaches described above all have as a basic understanding the co-evolution of new technologies and new practices. However, they focus on it from a system perspective, which might seem rather far from the single practice. To get a closer look at the micro-level close to the consumer, Shove and Pantzar did an exemplary work in their study on Nordic walking (Shove and Pantzar, 2005). Here, they show how a pair of sticks and the practice of walking, both quite well-known things for thousands of years, have been developed into a new practice: Nordic walking. In the construction of the new practice, both consumers and producers have played an important role in creating images, artefacts, and forms of knowledge, and they describe how new practices engender and entail new forms of production and consumption. Shove and Pantzar are inspired by practice theory as developed by Schatzki, Reckwitz, and Warde. However, they tend to use a more simple form of it as they focus their study on three elements of a practice – meanings, competences, and products – and on the dynamic relationship between these three elements. They argue that neither the sticks nor the knowhow of walking nor the idea of walking for fun or exercise are new, but that the combination and integration are made in a new way and thus form a new practice. They conclude that neither the producers of the sticks nor the consumers could have invented this new practice alone or could have reproduced the practice alone. Furthermore, they conclude that although Nordic walking is seen in different countries, they find it misleading to say that it has spread from Finland to other countries. Rather, they find that new variants of Nordic walking, that is, new practices, are emerging in new contexts. In their description of how the meanings, competences, and knowledge of Nordic walking are institutionalised, they draw on discussions from technology and transition theory of how building institutions and networks are important elements in developing new technologies. As the notion of niches suggests, this might be easier to do in small environments or communities, where the system builder already knows other actors or can easily get in contact with them. In the case of Nordic walking, a well-connected group of actors, including sports institutes, organisations, and manufacturers, is seen as an important ingredient in the rather fast development of Nordic walking (Shove and Pantzar, 2005).

Appropriation and domestication of technologies

The third and last element concerning technologies that I wanted to relate to practice theory is the question of appropriating and domesticating technologies. Theories of domestication deal with how people relate to new things and technologies in the different consumer phases of acquisition, use, and disposal of goods (see, for example, Lehtonen, 2003). Domestication is not only about a consumer getting used to a new product and learning to use it. In the process, both consumer and product may change, and the result is not always the use pattern that was anticipated by the producers. An even closer look into the relations that develop between the consumer and the consumer good can be found in an article by Kaj Ilmonen (2004). Based on, among others, the ideas of Russian psychologist Vygotsky, Ilmonen describes how the first step in the process of appropriation is internalisation, where one commodity is singled out and given a place in our social life – for instance, a house is turned into a home. This internalising is actually in the beginning a cognitive adoption, in the sense that all goods require skills and knowhow to be used properly. This cognitive adoption is, in many cases, an ongoing process and, during this process, we transform our relationship with the product, we go from objective understandings to subjective minds in our relation to the thing. This process is not necessarily an individual process; for instance, a family together creates the feeling of home, and the process is also under broader cultural influence. This implies that different types of consumers, for instance, related to gender and age differences, might undertake this process in different ways. However, generally, the more we are involved with and committed to the thing, the stronger the role it plays in our life, the stronger this process is. Following this cognitive adoption in the appropriation process is the way we decorate or configure the products to make them a part of us or as a way to extend our self and form a territory around our body (Lupton and Noble, 2002). Furthermore, the way we take care of the goods expresses our feelings for them, Ilmonen writes. The appropriation process not only changes our relation to the objects; it also changes our practices as our use over time becomes a routine, and, depending on the type of product, we might even stop to think about the product as it becomes just part of what we do. The last part of the appropriation process, according to Ilmonen, is the process of externalising, where we show other people what we have done with our product – for instance, how we have decorated our home or we show the result of our skills with the computer. And, by this, we might take part in the development of the practices, as others might respond to our ideas and use them as well.

Concluding remarks on the introduction of socio-technical approaches into practice theory

In the preceding sections, I have proposed different socio-technical approaches that can be included or combined with practice theory as described by Schatzki. These approaches include a system perspective from transition theories, an important contribution when dealing with a practice such as energy consumption, which has a strong link to the constitution of physical infrastructure. Also, understandings of how technologies are domesticated and appropriated are a relevant contribution as people interact with technologies and relate with them in many different ways in everyday life and this also has consequences for energy consumption. Finally, I have described an example of how new products and new practices co-evolve. The example is dealing with Nordic walking, which is a simpler practice than most of those connected to energy consumption, in the sense that it is a more delimited practice, that is not interwoven with as many different levels of technologies and actors as most energy-consuming practices. However, the example might still be illustrative of an issue which is of great importance when dealing with energy consumption – the continuous development of new practices and, by that, new needs in relation to the introduction of new technologies in everyday life.

My introduction of different socio-technical approaches into Schatzki's practice theory has been inspired by the way Reckwitz combines ideas from Latour and from Schatzki. When Reckwitz, in his article, proposes to incorporate Latourian theories into Schatzki's work, he refers to Schatzki's book published in 1996 (Reckwitz, 2002b). However, in the same year that Reckwitz's article was published, Schatzki published a new book, where he actually extensively discusses the work of Latour and opposes it for several reasons (Schatzki, 2002). First of all, Schatzki, like so many others, rejects the idea that Latour uses words indicating intentionality in relation to artefacts and technology. Furthermore, Schatzki contrasts his own practice approach with theorists like Latour and Foucault, whom he calls arrangements theorists, as they focus on networks and relations rather than on practices. Finally, according to Schatzki, Latour is also a nominalist who opposes the idea of a context for the social order, which is an important element in Schatzki's practice theory. In Schatzki's understanding, technology is a result of practices and a context for practices, whereas the socio-technical understandings typically emphasise the symmetrical relation and the co-evolution between the social and the technological. Regardless of the different understandings of the relation between practices and technology, I will give examples of how practice theory and socio-technical approaches combined can give insights on everyday life and energy consumption.

Using practice theory in analysing everyday life and energy consumption

One of the things that complicate the analysis of energy consumption in everyday life is that consuming energy is not a practice; it is an element in, a consequence of, or a necessity for many different practices. As mentioned previously, practices in everyday life include, for instance, cooking practice, clothes washing practice, or communicating and entertaining practices, but also what could be called "the practice of making a home," which includes keeping a comfortable temperature and lighting as well as cleaning, maintaining, decorating, and furnishing the house. In all these different integrated practices, we can find the dispersed practices of turning on and off thermostats, switches, remote controls, and taps whenever energy consumption is involved in the practices. It could be argued that practice theory might not be the best approach for analysing energy consumption when energy consumption cannot be viewed as one practice but has to be understood as elements in several different practices. The case is, however, that practice theory only highlights what also follows from an everyday-life approach. People do not consume energy in their everyday life; they do a lot of other things, for different reasons, and with different purposes and these imply or are followed by energy consumption. Understanding energy consumption, we thus have to focus on the different practices and, for this purpose, I will argue that practice theory in the way I have presented it above provides a relevant approach.

I have elsewhere used practice theory for analysing the practice of keeping a comfortable indoor climate (Gram-Hanssen, 2010a) and for analysing standby consumption practices (Gram-Hanssen, 2010b). I would like to summarize some of the insights and conclusions I drew from these two articles. Both articles built on qualitative interviews with families about their every day practices, combined with different kinds of measurements of their energy consumption. In both articles, an adjusted practice theory approach was used, which defined four elements holding a practice together:

- Practical understanding – embodied habits
- Rules – knowledge
- Engagements – meanings
- Technologies – material structure

The first three elements are in line with the work from Schatzki's book in 1997, though following the work of Warde (2005) and Shove and Pantzar (2005); the third element is renamed engagements or meanings rather than teleoaffective structures. The element "general understandings" from Schatzki's 2002 book are not included, as it is argued that this is integrated in the engagement-meaning element. Furthermore, a fourth element, technologies or material structures, was added, following the arguments presented in this article. The article on indoor climate focuses on how different households in identical houses perform the same practice in rather different ways and thus with the result of rather different levels of energy consumption. The other article on standby consumption focuses on how changes in the habits of turning off standby consumption can come about or not.

The two articles conclude that these four elements provide a good basis for analysing what holds practices together and for understanding which variations there can be within one practice as well as understanding how changes can come about. The articles emphasise the dual nature of these four elements and the practices. Each of the four elements should be seen as a structure sustaining practices at the same time that these elements are sustained and developed by the practitioners performing the practices. Another strong point of the theory is that it maintains that all four elements are equally important for understanding a practice or for understanding how to change a practice. This can even be relevant from an energy policy perspective. Economic incentives or campaigning might influence people's practices as they can affect their engagement in a practice; educational and informative initiatives might influence people's practices as they affect their knowledge about the practice. However, at the same time, there are many other engagements related to these practices. Furthermore, the embodied habits and the technology also take a strong part in structuring the energy-consuming practices. And these last points are too seldom reflected in the prevailing policy efforts to lower energy consumption from households.

Conclusion

In this paper, I have been looking for theories to understand how new everyday routines and practices, related to use of energy-consuming appliances can be conceptualised. For this purpose, I have introduced the practice theory from Schatzki and I have proposed ways to extend this theory in order to better understand the role of technologies in these practices. By combining practice theory with different approaches within socio-technical understandings of technology, I have proposed a theoretical frame that is able to deal with how social, cultural, and physical structures work as the context for both the stability and the change in these everyday practices, while at the same time seeing this context as a product of practices. This theoretical frame does not necessarily provide entirely new insights into the understanding of energy consumption in everyday life. However, it is able to combine insights from many different approaches and thus highlight the fact that embodied habits, knowledge, engagements, as well as technologies and material structures are all connected and constitutive of those different practices that are the cause of household energy consumption.

Acknowledgement

A previous version of this paper was presented at the European Sociological Association Conference, Research Network on the Sociology of Consumption, 3–6 September 2007 in Glasgow. The ideas of the paper were also presented at the workshop "Sustaining Everyday Life," April 22-24, 2009 in Linköping. I want to thank my colleagues for their good discussions and comments in relation to both occasions. Part of the paper was written during a research stay at Wageningen University, in the spring of 2007. I want to thank Gert Spaargaren and the rest of the ENP group for the invitation to join them as a guest researcher.

The paper was finalised while I was a guest professor in 2010 at Linköping University, Tema T, and I would also like to thank all my colleagues here for their hospitality.

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