‘Habitual practice’ and domestic energy consumption: identifying and describing potential ‘grips’ for change

Kevin Maréchal & Laurence Holzemer
Centre for Economic and Social Studies on the Environment (CESSE)
Université Libre de Bruxelles – Université d’Europe
44, avenue Jeanne CP124
1050 Brussels, Belgium
kevin.marechal@ulb.ac.be

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Abstract

The transition towards a low carbon society requires modifying current energy consumption patterns in households. Considering the insufficient results achieved so far by policies aimed at reducing energy consumption, this suggests a need for ‘escaping’ from the obsessive rationality-efficiency perspective. This implies departing from an ‘expert’ view and basing the analysis on those energy-related practices that are meaningful for the practitioners (e.g. people do not ‘consume gas’ but shower before going to work to wake up or cook meals for their children, etc). In order to look at this multidimensional issue of energy consumption through innovative lenses, we use an alternative conceptual framework building on the concept of *habitual-practice*. The rationale is to provide a precise characterisation of household energy-related practices allowing for a good understanding of their content (i.e. meaning, competences, understanding, etc) together with a clearer picture of how they are formed and sustained over time and whether they are subject to context variability and/or stability. One key element is that practices themselves embody the elements of constraint, ability and stability, sometimes referred to as ‘seeds of change’.

The aim of this research is to identify and describe these ‘seeds’, which we call ‘grips’. The reason is that energy policies could lean on the grips that emerge all along the processes involved in the dynamics of practices and can be ‘(de-)activated’ for supporting a behavioural change. For instance, when elaborating on reward-based tools, policy-makers should account for skilfulness since the feeling of being competent in performing a practice provides internal reward and/or social recognition. The added value of specifying grips arises from the fact that they can contribute to the identification of consumption profiles and then be used as a dialogue interface between those profiles and the design of innovative energy-saving tools.

Introduction: Getting a *grip* on the behavioural change process towards low energy-consuming domestic practices

The unequivocal link between climate change and anthropogenic activities (IPCC, 2007) requires an urgent, world-wide shift towards a low carbon economy (STERN 2006, iv). Considering that energy-related emissions amounts to a substantial part of global greenhouse gas emissions[1], this shift inevitably implies changing not only the way we produce and convert energy but also current energy consumption patterns.

This has been acknowledged by policy-makers for quite some time but with, to say the least, a limited impact on the ever increasing amount of energy consumed in developed countries. As claimed by different scholars (Wilhite et al. 2000; Harris et al. 2007), one important reason explaining this relative ineffectiveness of energy saving policies so far has been their focus on energy efficiency instead of energy conservation. As argued elsewhere (Maréchal, 2007), this can be attributed to the fact that, as in many other fields, decision-making in energy policy has been mainly informed by analyses built on the model of *rational actor*s which is the dominating paradigm in mainstream

1. Energy-related GHG emissions make up 80 % of total GHG emissions in EU-27 (EEA, 2007).

economics and other social sciences[2]. This model implies that the behaviour of individuals can be analysed as the result of agents maximising their self-interest by making considered decisions according the financial resources and information available to them.

As argued in a previous paper (Maréchal, 2009), the omnipresence of this paradigm in decision-supporting analyses has paved the way for the enthronisation of energy efficiency as an *end* in itself (i.e. rather than as a *means* of reducing of energy consumption) and, consequently, for the focus on financial incentives and means-ends information as the only levers to trigger a behavioural change (see also Bartiaux, 2008, Hayes, 2007).

However, beyond the aforementioned limited success on curbing current trends in energy consumption, a wide-ranging amount of empirical evidence has shown that the predictions of the rational model do not play out either in real markets or in designed experiments. An often-raised example is that the rational actor model has failed in explaining the existence of what is known as the efficiency paradox in energy consumption[3].

Furthermore, it must be noted that the field of domestic energy consumption is more difficult to handle since energy is not an object that people buy before use. Most of the time people only pay afterwards for the service rendered by energy utilised by devices such as electric appliances or boilers. Energy consumption is often considered to be invisible. It follows that if people do not really make a conscious decision of consuming energy they can not be expected to make a conscious decision to save it.

Consequently, there are an increasing number of experts that question the dominant use of a rational actor-model since it does not provide a complete and appropriate perspective for understanding the behaviour of consumers in environment-related fields. While rationality does play a role in decision-making processes, consumers are influenced by a far more complex array of factors. This may explain, at least in part, why the provision of incentives and/or tailored information does not lead to the expected behavioural change in domestic energy consumption.

Based on the considerations raised above, the objective of this research is to build an alternative conceptual framework that allows for understanding consumption dynamics multidimensionally while also being able to accommodate for the specificities of domestic energy consumption. In this paper we consider a perspective relying on the notion of habitual practices offers a promising avenue for dealing with the issues involved in reducing energy consumption in households and consequently for the designing of more efficient instruments and policies.

The theoretical framework

If policy-makers want to design innovative instruments and policies, it appears appropriate to take a different perspective regarding the determinants of domestic energy consumption and to better account for what energy consumption really means to people.

Fulfilling these criteria is exactly what the approach relying on the notion of *habitual practices* aims at. Initially, the term has been chosen to reflect both the concepts of *habits* and *practice,* with the aim of providing a converging approach of these two notions which evolved in different schools of thought[4]. As will be shown in the next section, this perspective is an integrative one which has been used more as a guiding post for exploring the many insights regarding domestic energy consumption rather than as a rigid framework.

The synthesis approach subsumed under the notion of *habitual practice* amounts to emphasising both the automaticity/unconsciousness and the multi-dimensional nature of domestic energy consumption behaviour. Furthermore, the proposed perspective is a great departure from previous analyses in that it allows for a better account of the mutual interaction of consumption behaviours with other influential factors: wider institutions, material objects and social networks.

These multiple processes of influences and their respective phases of development are essential to grasp prior to devising how to trigger a change of behaviour, as their understanding may provide important insights for designing innovative policy measures. This is why our alternative perspective builds on practice theory but is extended to those other aspects specifically needed for understanding processes of change in domestic energy consumption.

Practice theory and domestic energy consumption

Although there is no such thing as a unified 'practice theory' (Postill, 2008), authors such as Reckwitz, Warde or Schatzki, who ground their work on the theory of practice, singularise themselves in that they place the social neither in minds, nor in individuals, nor in norms or institutions but in the practices themselves. Although it is a debatable issue, providing a tentative definition of what a practice consists of, it is of functional importance at this stage. Following Reckwitz (2002, p. 249), a general definition is to see a practice as "*a routinised type of behaviour which consists of several elements, interconnected to one another*". The precise content of those interconnected elements will be further discussed below with the aim of providing a synthesis of the many insights proposed by authors working with practice theory. This synthesis is driven by a quest for putting the practice theory into operational terms for analysing the tenets of domestic energy consumption.

Obviously, those social practices (e.g. cooking, showering, lighting, etc) are not uniform but they can nevertheless be recognized as entities. The cooking practice, for instance, is differently performed according to the experience, the culture, the resources, the goals, etc of the practitioner. Furthermore,

2. Such a perspective on how to apprehend the behaviour of individuals is the central hypothesis of not only the *Homo oeconomicus* paradigm in mainstream economics but also of the *Attitude-Behaviour-Choice model* in social psychology.

3. This paradox refers to the well-documented fact that many energy-efficient investments are not implemented spontaneously by economic agents (i.e. households, firms as well as public entities) although they are highly profitable (Maréchal, 2007).

4. Such a converging approach has already been sketched in Maréchal (2010) and is also implicit in the work of Gram-Hanssen (2008) and of Shove (2008). It is clearly beyond the scope of this paper to further discuss these theoretical considerations but it is nonetheless important to stress that this merging of the two concepts is ontologically sound. Indeed, both practice and habits – as envisaged in the respective school of thoughts where they originate from – are clearly situated on what Reckwitz (2002, p. 246) call the common "blind spot" of the allegedly opposed atomistic and holistic approaches which "both dismiss the implicit, tacit or unconscious layer of knowledge". Looking at energy consumption through the lenses of habitual practices is specifically spurred on by the need to tap onto this "layer" where both sources of explanation (i.e. structural/collective and individual) can be accounted for.

most individuals will spontaneously associate "cooking" with a wide array of actions such as washing vegetables, preheating the oven, cutting the onions, etc. This can occur because the practice has been experienced and repeated over generations and in the course of the life of practitioners. To be recognized as such, a practice needs a certain level of repetition and this social reproduction of practice guarantees social stability since most individuals understand, know and accept, to a certain level, the way practices must be performed to be socially convenient. This reproduction of practices by the individuals and by society can also lead to a certain degree inertia since it participates to the process of behavioural and socio-technical lock-in. This is due to the multiple embeddedness of practices which renders more complex the possibilities of effective interventions as different processes are mixed and reinforcing each others (i.e. whether they are at the level of the individual, the household or the wider socio-technical context).

What is needed today, with the perspective of achieving a low carbon economy, is to create the conditions for people to turn their practices towards less energy-consuming ones. A major obstacle to that endeavour is that, more often than not, when energy uses are mentioned, debated or managed, it is done so in technical terms (i.e. amounts of savings in abstract units, efficiency of the appliances, etc), in rational terms (i.e. rational use of energy, choices of consumers, information processing, etc) or in instrumental and administrative terms (investments, subsidies and others instruments). However, when one looks at energy consumption from the standpoint of the household, all these "expert" criteria are mixed up with everyday concerns and experiences. In opposition to technical considerations, practices are meaningful to people to the point that they will often resort to describing the practices they are engaged in when asked about their life (Ropke, 2009, p. 2490). Accordingly, the energy consumed should be seen as a part of other practices, the meanings and purposes of which are completely different. For instance, feeling comfortable at home or cleaning oneself to be presentable at work entails a certain level of energy consumption. It follows that practitioners have already developed their own ways of understanding and managing the energy-related aspects of their practices. This does not preclude that the energy component of everyday practices is dealt with unconsciously and/or is invisible to the practitioners.

It is also important to note that energy saving is considered as a contingent practice. Energy saving can be a meaningful practice for some individuals and not for others, depending on their experiences (e.g. having placed insulation in the dwelling), negotiations (e.g. discussing the heating temperature) or motivation (e.g. willing to decrease one's ecological footprint). Being able to highlight and accommodate for this contingent nature of energy saving illustrates the interest of our analytical perspective. It allows us to depart from expert considerations to approach the layman's ways of consuming, understanding and saving energy.

But there are many other advantages in adopting an approach building on practice theory. For instance, an important element is that material and symbolic aspects are put on an equal footing allowing for an integration of meanings, cognitive aspects, appliances and bodily interactions within the same framework. In addition, it is also important to note that the habitual practice approach can well accommodate for the specificities of energy consumption recently raised in the literature such as the inconsistency of behaviours related to the compartmentalization phenomenon (see Bartiaux, 2008). Finally, through analyzing the routinization processes while also taking into account the co-evolution of practices with socio-technical systems, the habitual practice approach provides an appropriate starting point for understanding the issue of inertia which characterises the field of energy (see Unruh 2000; 2002; Maréchal and Lazaric, 2010).

In close connection to these issues of inertia and stability, the main interest of the habitual practice approach for our perspective lies in its ability to get a better grip on what really generates the amount of energy consumed. This, in turn serves to identify those elements on which to 'lean' in order to trigger a change towards low energy-consuming practices.

Those elements are what we refer to as grips. The habitual practices approach thus is an entry door for policy-makers or tool designers aiming to reduce domestic energy consumption, which consists of formulating a series of grips that have to be activated or inhibited for supporting the desired change.

The very idea of the grip is already present in the literature on practice theory, albeit formulated in a different way. For instance, Alan Warde talks about the "*seeds of constant change*" which are contained in the social practices. He then further explains that the practices "*are dynamic by virtue of their own internal logic of operation, as people in myriad situations adapt, improvise and experiment*" (Warde, 2005, p. 141). Besides this internal source of change, it must also be stressed that "*practices are not hermetically sealed off from other adjacent and parallel practices, from which lessons are learned, innovations borrowed, procedures copied*" (Warde, 2005, p. 141).

A question that arises at this stage is why using the specific term grips rather than those more commonly use in the literature such as barriers, levers, cogs or spirals? Here the metaphor of climbing is very useful to use since it is where the very idea of the grip originates from. This metaphor serves to highlight the process needed to achieve, grips by grips, the objective of getting up to the top of the wall. Many possibilities exist for the climber with respect to choosing which combinations of grips to use. What is important to note is that the combination the climber will choose will vary according to a wide array of parameters. The same grips will not be chosen if the climber is tall or small, if the objective is to follow a special route for exercising, if the objective is to climb as fast as possible or as secure as possible, if the weather is rainy and the wall slippery, etc. What the metaphor demonstrates is that the use of grips rather than other words is meant to emphasise the multiple aspects that have to be taken into account when designing tools or segmentation, due to the multiple levels of embeddeness of the practices (form the individual to the socio-technical level). The level of performance of a climber will depend on his personal characteristics but also on his climbing characteristics (prescriptions, classification, experience, motivation, objectives etc) and on the context of performance (weather conditions, accompanying person, etc). If one wants to help as many people as possible to reach the top of the wall (i.e. to reduce their energy consumption in our case), all these aspects must be taken into account when designing the services and tools to be provided and or the combinations of grips to indicate. To put it differently, and coming back to energy consumption, in-

stead of targeting homogenous individuals on a single market, behaviour-changing tools should be designed acknowledging the existence of different kind of practitioners who act in different contexts of performance.

The central notion of grips and its role within our perspective will be further detailed and developed in the following section. Still, it is useful to illustrate with an example how it can complement the existing literature. For instance, rewards often come out as potential levers for breaking a habitual practice. An external reward will often be deemed to be easily implemented but, at the same time, they are also known to lack a pervasive effect (i.e. the changed behaviour stops when the reward is removed). Other forms of rewards (i.e. internally activated) can prove more effective in the long run provided that they tap into positive emotions such as pride or the feeling of being competent. This argument of activating (or of building on) the notion of skilfulness typically is a grip that has also been highlighted within the field of practice theory.

Extending the habitual practice framework

Exacerbated by the lack of a single and "*authoritative*" formulation (Warde, 2005, p. 132), the most challenging issue with practice theory undoubtedly is the passage from theory to practice. The first question that arises is that the units of analysis cannot easily be assessed as they do not correspond to common elements such as persons, households or groups. A second issue is that practices are more or less integrative[5] and that some of them are performed by a single person while others require several individuals. We choose to pass around all these difficulties by using the practice theory as a heuristic tool that guides and arranges the many complementary insights arising from other disciplines and theories.

Finally, a third issue, but not insubstantial issue, is that consuming energy cannot be considered as a practice in itself but rather as a consequence of many practices. The resources – among which is energy – mobilised when performing a given practice are only one dimension of its constitutive elements. The question that comes next in the reflection sequence then is: what are those other constitutive elements that we should study when looking at energy consuming practice? Or, to put it differently: what are those side-aspects that could highlight the barriers and levers to enhancing energy saving practices?

Going back to the aforementioned definition, Reckwitz (2002, p. 249) mentions that the interconnected elements that make up a practice are "*forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge*." In line with this, Schatzki (quoted in Ropke, 2009) had identified three components that overlap with Reckwitz's elements: the understandings; the explicit rules, principles, precepts and instructions; and the teleoaffective structures (i.e. ends, purposes, motivations, beliefs, emotions etc). He then later identified the materiality of the practice as being a fourth element. This latter material dimension is also present in the elements identified by Shove and Pantzar (2006) in addition to competencies and meanings. Still in the same direction, Warde (2005) proposes to separate the constitutive elements into three categories: the understandings, the engagements and the explicit rules, precepts and instructions.

We observe that, apart from subtle theoretical differentiations and different labelling, the main constitutive elements of practices are consistent throughout the definition given by the major authors working on practice theory. Spurred on by an operational concern, we proceeded to our own categorisation, with the aim of building 'boxes' that would then serve for "sorting" grips. Globally, all the aspects identified above were included but labelled or grouped differently.

We gathered all the cognitive aspects together. Motivations, ends, projects, tasks, emotions and beliefs (i.e. what Schatzi calls teleo-affective structures) thus go side by side with competences and knowledge. The material aspects have been detailed, and include different elements such as the money, the support for information, the resources, the appliances and the infrastructures. However, explicit rules, precepts and instructions – which are grouped in Schatzi and Warde's definition - disappeared altogether from our categorisation. Instead of constituting a specific category, they were distributed in the cognitive and material dimensions where they are operating on different elements. Prescriptions of usage can, for instance, be inscribed in appliances or have different impacts on individual's motivation or emotions, or perception of social norms for example.

To complement this perspective, it is essential to note that, in line with Halkier (2001), everyday life experiences are not only made of the performance of practices but also of social relations[6]. Impregnated with this view, we chose to enrich and extend our framework. Firstly, we wanted to include the social component (i.e. in the sense of intersubjective interactions) since our units of analysis are the practices performed by individuals who are in interaction within their household which, itself, is included in a wider social network. And, secondly, since practices are recognised as a more or less routinized form of behaviour, we added habit-related insights to our framework in order to provide additional elements for a better understanding of lock-in and path-dependency aspects and of related opportunities for behavioural change. Altogether, this synthesis effort amounts to following extended and operational framework.

The following paragraphs are devoted to a more precise description of the content for each of the four dimensions presented in Figure 1 together with a series of suggested grips that ensue from this description. The habitual-practice give us a coherent approach in which we also include insights from other theories. We acheive to an approach which posses the advantage of being integrative.

The cognitive aspects of a practice are numerous and varied. Every practice contains a specific emotionality, even if it under the form of a high control of emotions (Reckwitz, 2002). Someone can feel proud in performing a given energy-saving practice but be discouraged and unmotivated when performing another one. This would most likely give, from an external 'expert' standpoint, an impression of incoherence, whereas it could in fact result from a feeling of competence that is only activated in one case but not in the other. Those cognitive as-

5. Warde (Warde 2005) defines an integrative practice as a more complex practices found in and constitutive of particular domain of the social life (e.g. the cooking practice that includes the provision practice, the food refrigeration practice, etc)

6. To be precise, Halkier adds 'interpretation' as a third constitutive element.

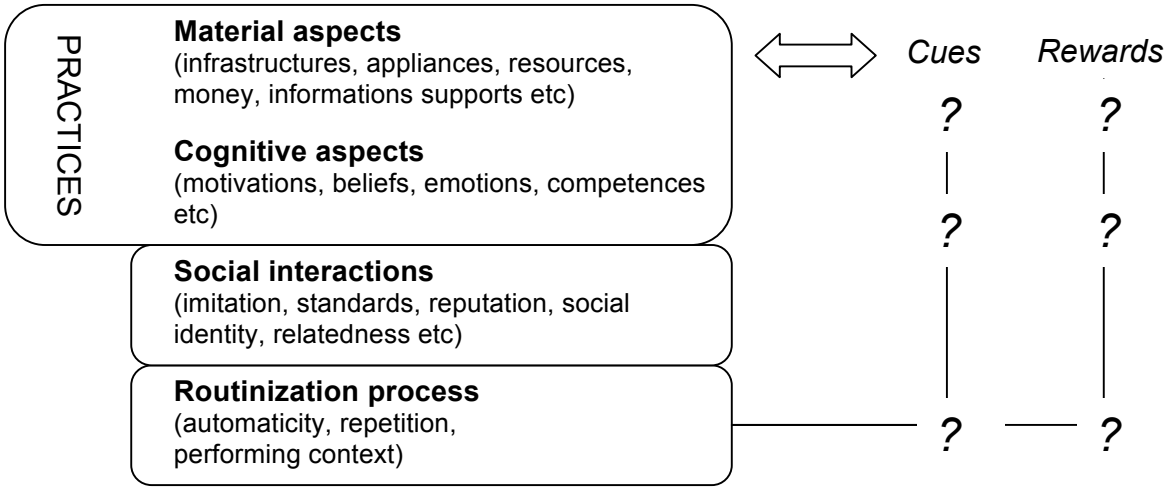

Figure 1. Our extended and operational framework.

pects are indeed related to the psychological functioning of the individual who performs the practices but can change, for the same agent, from one practice to another.

The cognitive aspects are wider than solely emotions. Goals, motivations, beliefs, meanings, skills, knowledge, etc can also be mentioned. The starting point for analysing this dimension is that for a behavioural change to occur a degree of self-regulation will be required. The ability for self-regulation will be enabled, constrained or limited by other aspects such as, the need to turn practical knowledge towards more discursive knowledge (Bartiaux 2008). Other cognitive aspects, that may have a strong influence impacting on self-regulating abilities, can also be found in the abundant literature on cognition in many streams of psychology (i.e. social and evolutional psychology or the self-determination theory, etc). This literature highlights some potential grips influencing self-regulation, such as the need (even unconsciously) for a clear behavioural standard (i.e. "I am ready to change, yes, but compared to what?"). There is also a need for making the link, between a given behaviour and its consequences, more visible in order to highlight the perceived importance of that same behaviour[7].

Social psychology theories on self-efficacy indicate that the attempts and persitance of behaviour change depend on the individual perception of one's own skills and possibility to act in a prospective situation (Bandura, 1991). Visibility and relevancy of the behaviour linked to the energy consumed is thus a necessary first condition for motivation to exist. The motivations, in turn, play an important part in the change process as explained by the following sequence: the more the perceived origin of the motivation is attributed internally by the individual, the more the identification process to the goal is advanced, the more the motivation can lead to effective change (Ryan and Deci, 2000). The internal aspect of motivation can be enabled or limited by other aspects such as the feeling of being competent for the practice at hand (i.e. what is also sometimes referred to as 'skilfulness'). If one feels unskilled at a given task, he or she can be discouraged and limited in his willingness to change. The same idea exists in the studies of addiction where the perceived ability to act is an important parameter of influence on change (Wilson and Dowlatabadi, 2007). However, this same willingness could be sustained or enhanced by triggering some positive emotions such as pride (e.g. through a recognition by peers or a comparative feedback). The cognitive category contains grips that are very different with respect to their strength and/or their way of action. Some will highlight important barriers e.g. the discouragement ensuing from the feeling of being non-competent. This is an important aspect to be born in mind by policy-makers since this feeling can arise, for instance, from inappropriate goal setting in commitment tools. Other cognitive grips are more likely to be activated positively. As an illustration, the identification to the goal (under some conditions) could be used in many tools through social labelling techniques.

Bearing in mind the ontological origin of habitual practice, it is necessary to look beyond the micro level of individual-related cognitive aspects since habitual practices are also embedded in a wider context[8]. In line with the view developed in Giddens, socio-technical systems shape and condition habitual practice, while the latter also contribute to shape and stabilize the incumbent system (Maréchal, 2009). Furthermore, it must be noted that this mutual constitution is also valid for the relation between habitual practices and objects since artefacts both shape and are shaped by the contexts in which they are used (Smith and Stirling, 2007, p. 351). These considerations reinforce the idea that it is not only the choices of individuals that can orientate their behaviours towards less energy consuming options given that the design of a device can reinforce high energy consuming behaviours. Consumers who are "willing" should rather be viewed as partly "locked-in" (Sanne, 2002). For instance, standby consumption could be seen merely as the result of laziness but in part could also be explained by design considerations since many appliances do not allow for programming to be stored when completely switched off. In addi-

7. This obviously is of great importance in the field of energy.

8. Here it is important to recall that the theories of practice are spurred on by a desire to surmount the actor/structure dualism. They are neither individualist nor holist (Warde, 2005). This is obviously also needed for energy consumption analyses where a recent empirical study has shown that the behaviours observed display both "similarity and collectivity" as well as "variety and individuality" (Gram-Hanssen, 2008, 14).

tion, it should be acknowledged that there is not only the device itself that is agentive since these "*technologies are only the tip of an interlinked regime of technologies much of which is opaque to the user*" (Wilhite 2008:124). Hence, in the longer term, energy polices should focus more on "*how regimes affect practices and how dependence on (those technologies) can be reduced*"[9].

Accordingly, it is essential to enrich the purely cognitive vision of consumption behaviour (i.e. being motivated is enough to trigger the corresponding behaviour) that often prevails by including technical and material aspects into the picture.

To start with, it should be stressed that objects are not neutral regarding their related practices as they contain prescriptions of usage and thus limit the actual possibilities of change. It was also thought necessary to include in the material category what are called intermediaries as those proposed by Callon and al. (1992)[10]. Accordingly, the constitutive elements of this material category not only include the resources mobilised, the infrastructures (e.g. the dwelling) and the appliances used, but also important intermediaries such as money or information and its media (cd, websites, paper etc). The grips related to all these aspects are numerous and can be enriched by many other domains of research. The informational grips, for instance, could be enriched by the human-machine interaction literature (see, for instance, Myers 1998) and also by media-user studies (see, for instance, Brandtzæg 2010).

The grips related to resources mostly concern the crucial problem of energy's invisibility. Indeed, domestic energy consumption is characterised by poor or non-existent witness or control of the amount consumed on most appliances, including hidden wires and poor positioning of the energy meter. Altogether, this greatly contributes to maintaining energy as a remote issue that is difficult to connect with actual practices. To make the amount of energy consumed more visible, relevant and meaningful for the households, many principles have to be followed. For instance, the immediacy when giving feedback increases the possibility for the consumer to link their actual behaviour with the energy consumed. The choices of language, metaphors, representation and units used are crucial to make the information 'more visible' to the households in the context of their everyday life practices. Generally, a more household-centred conception of energy is needed (Parnell and Larsen 2005).

The grips related to appliances mainly concern the scripted prescription of use, and the possibility of control, together with the visibility of the service that is provided by the use of energy. Indeed, as shown in Wood and Newborough (2007), not all behaviour change is possible. This greatly depends on the characteristics of the appliances. There are more possibilities to change an appliance-related behaviour with appliances that have a low level of automation since low automation will increase the time spent around the appliance and thus the level of interaction between the user and the appliance through its functions[11]. Nevertheless, 'well-known' appliances, such as those owned for a certain time, or non-complex appliances, such as a kettle, will often involve a transition from a knowledge-based mode of management to a skill-based one. This transition will then lead to a more habitual pattern of use and thus limit the possibilities of behavioural change (2007).

As mentioned above, the categorisation of the constitutive elements of practice developed here has been enriched by adding the "social interactions" dimension. Domestic energy consumption related practices lie within the scope of the everyday experiences of the household's members inside their social network. As underlined in (Bartiaux 2008:1172), "(s)ocial *support appears (…) to be a key variable and is obtained from the individuals' social networks, either real, with familiar persons, or virtual, via the mass media*". This category allows us to search for grips within different disciplines, such as sociology, anthropology or social psychology. We gather in this category, grips related to the normative influences of groups, the need for status and social recognition, the need to belong to a community, reputational concerns, identity issues, etc Those grips will highlight the functioning principles operating in some of the strategies aimed at behavioural change (such as those relying on commitment or comparative positioning). Given that the social context may act as a filter for most individuals, those grips can also stress some important drawbacks in commonly used informative tools. For instance, it is well known that an informative message will be more effective if the sender is trusted (Barr and Gilg 2006) and if the channel is socially embedded (see, for example, Simon's concept of docility in Simon, 2005, p. 95).

Finally, our approach also deals with the routinisation process that characterises practices, by incorporating some insights from the literature on the process of habit forming. The concept of habits, which is mostly studied in the realm of social psychology and Veblenian evolutionary economics[12], is referred to in order to emphasize that many of our daily activities are routinized forms of behaviour that are performed without the kind of deliberation and consciousness assumed in the rational choice model (Verplanken and Orbell, 2003). The reliance of people on habitual types of behaviour (i.e. habitual practice as called in our approach) is extremely important to grasp since, given their characteristics, they can undermine formulated intentions to change (Verplanken and Faes, 1999)[13]. Given the perspective of this paper, it is also important to note the presence of what Unruh (2000) has called a process of lock-in, whereby habitual practices get more ingrained with time in the case of context stability[14].

Studying habits helps us to understand which are the processes and the conditions promoting the settling of a given behaviour. Those inputs are interesting for us in two opposite, albeit complementary, directions. On the one hand, they can

9. Wilhite (2008) illustrates this issue with the example of the development of air conditioning which should be refrained before it "colonises practices".

10. Through facilitating the interplay between agents, artefacts and institutions, intermediaries play a role for explaining the reinforcement and stability of socio-technical systems (see also Stephenson, 2010, p. 6121).

11. The appliances with a high level of automation are those that do not require the user during the operation (e.g. the vacuum cleaner).

12. The notion of habits as used in our approach is the one described in Maréchal (2009, 2010). The view of habits as developed in these papers is a tentative synthesis of the work of Bas Verplanken and Wendy Wood in social psychology with the work of Geoffrey Hodgson or Olivier Brette in Veblenian Evolutionary Economics (i.e. a school of thoughts inspired by old institutionnalists among which Thorstein Veblen).

13. This is one reason why the presence of habits is considered as an important explanatory factor for the existence of the efficiency paradox in energy.

14. The above-mentioned concept of docility participates to this process of lock-in.

serve to identify the aspects on which to lean (i.e. the grips) in order to '*break a bad habit*' (Verplanken and Wood, 2006) and on the other hand, they can also be used to identify ways to sustain an emergent behaviour and make it become more routinized, thereby targeting a more pervasive behavioural change. It is important to note that the grips related to this habitual dimension are treated transversally to the cognitive, material and social interactions (as illustrated on the Figure 1). By definition, habits are characterised by an important degree of automaticity, entailing many different aspects, among which is a low level of intention (Bargh, 1994). To break a habit, it follows that the automatic association of a given behaviour with a signal must be broken and, among other things, intentionality should be enhanced. This aspect clearly meets with (and completes) motivational grips (i.e. that are in the cognitive category). The same is valid for the other elements characterising automaticity; a low level of control, a high level of efficiency, a high degree of identification and a low level of consciousness (see Verplanken and Orbell, 2003).

Habits are activated by the presence of environmental signals known as cues (Verplanken and Aarts, 1999, p. 104). These cues are very varied and can be viewed as transversal to the other dimensions. A cue can be the presence of specific people (e. g. when I receive my friend at home, everything must be lighted, warmer, etc), specific places, specific moments, money, appliances, body states (illness, moods, etc) or task definition. Some events, such as moving house, the birth of a child, change of energy provider, etc can also modify the cues and disturb the stability of a habitual practice. Such changes of context do not make habitual practice change either automatically or directly and are better viewed as "windows of opportunity" (Schäfer and Bamberg, 2008). To break a habitual practice, we thus have to take into account the context of performance, and to identify and use, possible windows of opportunity.

The insights coming from the literature on habits also extend to the notion of reward. Generally, when we speak of reward, we mean external reward. Habitual practices are reinforced because they give access to different kinds of rewards that are both internal and external. It is important to identify those rewards which habitual practice give access to and then reflect on ways to decrease the access, if possible, and/or activate similar or other kinds of internal reward for an alternative behaviour. This is where the notion of grips comes back into the picture by creating a reward which can lean on the tendency to further oneself and increase the feeling of being competent, or related to the social recognition, or increase the feeling of participation, etc.

Towards the grips: operationalizing the framework

How could this extended theoretical framework help for the design or assessment of energy saving tools? Concretely, what makes a different from another and what does it imply for its operationalisation?

Our theoretical framework gives us some clues for the effective use of those grips thereby confirming the reason why we prefer to use the label "grips" rather than "lever" in order to stress that a single lever will most likely never be sufficient to trigger a change. Instead, a combination of grips will often be required for changing a given practice, whereas only one barrier overlooked or one grip lacking can stop the process.

Each grip has some operationalisation specificities. First we face two kinds of grips as we can differentiate those breaking a barrier to behavioural change and those going towards the change. Secondly, grips vary according to the practice dimension that is impacted. If one wants to change a practice and stabilize it, all four dimensions of a practice identified above (cf. Figure 1) should be in alignment with the change process. Thirdly, the (de-)activation of different grips will display different impacts depending on their strength, necessity and ease of application. We further detail those considerations in the next section.

BREAKING A BARRIER OR CHANGING A PATTERN TOWARDS BEHAVIOURAL CHANGE

The grips activated or de-activated will then enter in a behavioural change process. They can participate in the identification of sources of inertia and in the breaking of the barriers for effective change. This underlines the fact that policy-makers should not only focus on the innovation process since many grips are needed to change a behaviour but only one barrier, such as a limitation arising from one component, can stop the process (Stephenson *et al.* 2010). Thus, Shove and Pantzar (2006) suggest that*"studies on practice innovations should be supplemented by studies of the processes of killing practices — of breaking links between the components that held the practices together"* (Røpke 2009:2495). The grips related to this process can be, for instance, to make energy more valuable and visible, or the identification and the suppression of rewards linked to the "bad" practice.

The grips can also enhance a change in the practice pattern, as described by Røpke (2009).

> "The emergence of a new practice requires a process of innovation where agents configure a set of bodily-mental activities by integrating elements of meaning, material and competence. If such a configuration diffuses by being taken up by others, a new practice can emerge as a provisionally stable and recognizable entity"; "Practice innovation is about making new links between existing or new elements" (Røpke 2009:2494).

STABILIZATION AND STRENGHTHENING OF THE CHANGE PROCESS: ALIGNEMENT OF THE DIMENSIONS

The stabilisation and strengthening of the change process described above can occur when the different practice elements are aligned and self-reinforcing, as for example when available information on changing behaviours is convergent/in alignment with the norms socially spread around the practitioner. This obviously necessitates a fine-tuning of our understanding of those elements mobilised when a given practice is performed if one wants to change it. Aiming at putting the habitual practices approach into operational terms (i.e. to create efficient combinations of grips on which energy efficiency tools could lean), we have 'sorted' those elements in different drawers, as explained above. However, it is important to stress that it does not prevent from acknowledging that, in reality, grips do not work in isolation. Even if cognitive aspects related to energy can individually be differentiated, they could not be treated in

isolation from the material aspects (such as the appliances' latent prescriptions of usage) or from the social influences. Until that stabilisation happens, we have to open the different drawers of practice dimensions and check which are the elements not aligned and then activate some of the corresponding grips.

DIFFERENT GRIPS, DIFFERENT IMPACTS

The last specificity of the grips when it comes to putting them into operational terms concerns the activation process in itself. The activation of some grips for behaviour change is required while others are more or less facultative. We call "*essential grips*" those for which an absence of activation would result in the change process halting. The use of "*supportive grips*" is not necessarily needed for change but can nonetheless help sustain the activation of other grips and the alignment process of the different dimensions of habitual practices. However, their isolated activation would not be able to trigger any effective change.

Here follows a small example to illustrate the difference and the utility of distinguishing between the two kinds of grips. A certain degree of self-regulation is always required for triggering a change of behaviour. As mentioned earlier, self-regulation can be enhanced by activating a combination of grips impacting on motivation, competences, etc A frequent response to this issue is the use of information-based tools, such as feedback tools, which are seen as increasing awareness and knowledge (and often implicitly motivation).

However, if one wants to achieve these objectives with feedback information, essential grips have to be activated. Among others, the information should be more personalized (Desmedt, Vekemans, and Maes 2009) and household-centred (Parnell et Larsen 2005). It should also be adapted to the receiver's capacities (in terms of constraints on time, finance, material and body and of competences, references) and sustain the perceptions, attention, mental models and memory (Wickens et al. 2004). Moreover, neither being "motivated" nor the intention ensures the passage to action. A promising way forward is to generate intrinsic motivation which can be done by activating grips, such as the feeling of being competent. Therefore, this 'skilfulness' would be an 'essential grip' that could be supported by using positive reinforcement prompts (i.e. a supportive grip) (Arroyo, Bonanni, and Selker 2005).

Bringing out those two levels of necessity, the essential and supportive grips help us to build hypotheses about the effective combination of grips to build a tool, and about the effective combination of tools for a policy. From an evaluative point of view, we could, on the basis of our integrative framework, formulate hypotheses of improvements based on the analysis of all the grips activated in a policy package. This would require looking at the grips missing, the barriers still remaining, the dimensions not impacted, the opportunities not yet taken, and formulating recommendations of combinations of grips to activate accordingly.

Concluding remarks and future research

Only experience and field studies will prove the effectiveness of combining different grips for changing energy-consuming practices. The results of such studies would allow us to fine-tune the specification of the grips and build scales with which to classify grips according to their strength of action and ease of application. At this stage of the research where only small and non-representative experiences of tools evaluation have been done, it still lacks a large-scale empirical study and those important criteria can only be postulated. However, the information we have and the analyses of instruments that we have already performed using the notion of grips, allow us to feel confident about its relevance for studies on energy consumption. For instance, the notion of skilfulness together with the nature of the relationship an individual has with their dwelling (a cocooning versus a practical one) have proven insightful for improving existing instruments. Our preliminary analyses also show that providing feedback that is efficient in changing habitual practices is an avenue that could greatly benefit from a good understanding of the notion of grips, as described in this paper. The operationalisation of the grips would most likely gain in effectiveness with complementary work on the different profiles of energy practitioners. "*Empirical evidence indicates differences between groups of people with regard to their understandings of a practice, the procedures they adopt and the values to which they aspire*" (Warde, 2005).

It would be important to base such a reflection on the profiles using the same framework as the one used for searching out grips. Using the same language and rationale would allow for integrating more dynamic elements into the segmentation approach (such as the potentially evolving and improving knowledge, motivations, competence or relationship with the dwelling, etc). Through doing this, the notion of grips could effectively become a useful dialogue interface between profiles and innovative energy-saving tools, which would greatly facilitate the design of efficient policies in the field.

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