Modelling Practices and Routines - Where are the households?

Tina Balke: t.balke@surrey.ac.uk and Thomas Roberts: t.m.roberts@surrey.ac.uk

1. Introduction

This paper explores the possibility of modelling routines. To do so, it takes social practice theory approach. The premise for this being similar social science concepts can be modelled in a similar fashion. We start this paper by briefly comparing both social practice theory and routines (Section 2) to determine (dis)similarities. In Section 3, we take this analysis as a basis for discussing the modelling of the two concepts. Starting from previous modelling considerations for social practices, by relating to the before identified (dis)similarities, we argue that routines and social practices are closely enough related to model both in a similar fashion, namely as agents in an agent-based model. The paper closes with a brief conclusion.

2. Theoretical Concepts

This section lays the foundation for our modelling discussion by first considering both social practices and routines from a social science perspective. Both concepts are briefly outlined and their relation to one another is discussed.

2.1. Social Practices

Social practices are the activities which people undertake during their daily lives (such as commuting, washing, cooking), taken together these practices are what constitutes social life. Traditionally, resource consumption has been measured in terms of attitudes, behaviour and active rational choice, however, proponents of practice theory argue that the reality is far more complicated (Browne et al. 2014; Shove 2010). Theories of practice place practices at the centre of the model of social change rather than the individual (Spaargaren 2003). Central to this approach is the principle that practices are made up of elements, materials (objects and infrastructure), skills (practical knowledge and know-how) and meanings (social norms, ideas and interpretations). Change then occurs as the relationships between these defining elements evolve, links are made and broken and change when new elements are introduced or when existing elements are combined in new ways (Shove 2012). To become practices, these elements need to be regularly reproduced by skilled and knowledgeable actors or carriers. While these 'carriers' are essential to practices becoming established, it is the practices themselves which are considered, the basic domain of study for the social sciences (Giddens 1984).

2.2. Routines as Part of Social Practices

The relationship between social practices and routines is an important one. Routines both contribute to the meaning elements which represent a core part of practices and are critical to the reproduction of practices. The meanings which are attributed to different practices are constructed through the active stitching together of routines and through their daily reproduction (Shove 2003). Routines are also critical to evolution of practices especially as changes often lie beyond the boundaries of the practices in question. For instance shifts in the hours which people work can have

a knock on effect on a wide range of practices such as food preparation, heating and watching television.

Shove (2003) draws on the work of Wilk (1999) and Bourdieu (1977) to provide a more comprehensive analysis of the role routines play in the evolution of practices. Wilk argues that habitual aspects of daily life only change when they are brought into the open. Once in the open they can be reconfigured and then sink back into the unconscious daily practice habitus. For instance the desire for mobile communications became explicit during the late 1980s and 1990s as new 'novel' devices started to emerge. However, as their popularity grew by the early 2000s they had been absorbed back in to the habitus becoming a largely invisible part of everyday routines.

3. Modelling Considerations

Having briefly outlined both social practices as well as routines from a social science perspective, the paper now turns to the question how to model them. Again we start from social practices and their modelling and based on these consideration as well as the discussion of the interrelation of social practices and routines in the previous section, then move to the question of modelling routines.

3.1. Conceptualizing Practices as Agents

As discussed in Balke et al. (2014), agent-based modelling is a suitable approach for modelling practices. However, a key challenge is determining the starting point and deciding how best to approach the topic. In contrast to the typical agent-based modelling approaches where households or persons are placed in the focus of attention, the authors argue that practices should be modelled as agents and hence represent the main unit of analysis.

The justification for this is based on both Giddens discussion of the agency of practices on the social science side (Giddens 1984) as well as Macy and Willner's discussion of what constitutes an agent from a computational perspective (Macy & Willer 2002). Giddens argues that practices possess both structures and agents form the basis of social arrangements and should therefore be the centre piece of analysis. Giddens argues that the focus should no longer be on individual or household decision making, but on 'the doing' of various social practices and the inconspicuous consumption that forms an integral part of many practices (Shove & Warde 2002). As a result, the individuals become the 'carriers' of social practices rather than the centre of attention (Reckwitz 2002). Consequently, a key question for researchers interested in using models to explore social phenomenon is how can practices be modelled? One modelling approach which offers the possibility to analyse a system by focusing on the component agents is agent-based modelling. Agent-based modelling takes an agent focus, allowing a system to be analysed from the perspective of its composing entities and the interactions between them, rather than taking a high level global view which makes the understanding of the local dynamics far more difficult. Based on these general ideas, Macy and Willner (2002) discussed which minimum requirements need to be fulfilled to model something as an agent in an agent-based model (i.e. what constitutes an agent in the computational modelling sense). They derived at a list with 4 criteria:

1) Autonomous Behaviour: Systemic patterns emerge not as a result of central planning, authorities or institutions, but as a result of the interactions between the individual actants in the system.

2) Interdependence: The different agents in a system influence each other.

3) Agents follow simple rules.

4) Adaptive and backward-looking behaviour: Agents adapt by imitation, replication, and so on, but not by calculating the most efficient action.

Based on these criteria Balke et al. (2014) argues that different social practices can be modelled as agents according to Macy and Willner criteria, whereas households are considered mere carriers of these agents. Thus, social practices can show individual autonomous influences on the system in the sense that their system influences are not centrally planned and coordinated, but result from the individual characteristics of the social practices and the environment they are situated in. Similarly, social practices can influence other practices (e.g. the showering practice might for example influence the laundry practice in terms of more towels being used and therefore requiring washing). Balke et al only use a simple behavioural rule for practices, in which a practice tries to increase the number of its performances by households. Practices can change, for example as a result of changes in the elements the households use when performing the instances of practices (e.g. adopting power showers). New practices can be 'born' (e.g. the showering) if new elements appear and are being used (e.g. the shower as product) or if old practices are being recombined in a new way.

3.2. Households and Routines

Having explored how practices can be modelled as agents, a second important question is can routines also be modelled as agents. As outlined in Section 2, routines form an integral part of practices, both in terms of being part of the meaning element as well as by forming a basis for their habitual nature which is crucial for the reproduction of practices. As a consequence, an initial naïve consideration could be that due to this similarity, social practices and routines both should be modelled similarly, i.e. as agents. There are however, some potential challenges associated with this approach: First, we need to consider whether routines also fit the criteria outlined by Macy and Willner, i.e. whether routines fit the criteria of agency in a computational view, and second, how the routine agents and the social practice agents relate to one another if they were to be placed in the same model.

Looking at the criteria set out by Macy and Willner routines can show individual and autonomous influences on the system in the sense that non-centrally coordinated (but purely based on the characteristics of the routines), by influencing the reproduction of practices through the influence of the carriers of practices (e.g. humans or households). Similarly, a routine can influence other routines (e.g. a getting up routine can influence a breakfast-making routine). Thinking about the behavioural rules of routines, there are a number of similarities with practices, i.e. routines encouraging (or trying to strengthen) the number of their performances, also routines can change (due to changes in the environmental setting, e.g. when new materials become available) and they can die or be born.

Therefore, it seems that if we adopt Macy and Willner criteria, modelling routines as agents has potential. In the same way we consider the households as simple carriers of practices we can do the same with routines.   But if one can model both, practices and routines as agents, how do these agents related to one another and how should one go about incorporating the different kinds of agents in an agent-based model? Starting with very simple consideration, it seems useful to have a hierarchy of agents, with social practices agents being on a higher level than routine agents. The reasoning behind this hierarchy distinction is that routines are a sub-part of practices. Routine agents, by interacting with practice elements are able to generate new practices or strengthening/weakening existing ones. Practices in turn can foster or discourage routines, hence helping to increase or decrease their number.

4. Conclusions

Based on the literature of practice theory and the concept of agency by Macy and Willner, in this paper we argue that both routines and practices can be modelled in a similar fashion as agents in an agent-based model. This approach is different from traditional agent-based models where typically households or individuals are seen as agents, where in our approach these are simply carriers of practices and are therefore not explicitly modelled. With respect to the relationship of the different agent types to one another we propose the idea of a hierarchy of agents with practice agents being at a higher hierarchy level then routine agents. One interesting question resulting from this hierarchy idea and the agency discussion is whether similar to the argumentation with respect to routines and practices, in a similar fashion one can model other subcomponents of practices as agents and use such an agent-based model to study the interaction between these modelled agent components to learn more about practices themselves. This however is work for the future.

5. Literature

Balke, T. et al., 2014. Modelling energy-consuming social practices as agents. *Social Simulation Conference, 2014*. Available at: http://fawlty.uab.cat/SSC2014/ESSA/socialsimulation2014 035.pdf.

Bourdieu, P., 1977. *Outline of a Theory of Practice" translated by R. Nice*, Cambridge.

Browne, A.L. et al., 2014. Patterns of practice: a reflection on the development of quantitative/mixed methodologies capturing everyday life related to water consumption in the UK. *International Journal of Social Research Methodology*, 17(1), pp.27–43. Available at: http://dx.doi.org/10.1080/13645579.2014.854012.

Giddens, A., 1984. *The Constitution of Society: Outline of the Theory of Structuration*, The Polity Press.

Macy, M.W. & Willer, R., 2002. From factors to actors: Computational sociology and agent-based modeling. *Annual review of sociology*, pp.143–166.

Reckwitz, A., 2002. Toward a Theory of Social Practices - A Development in Culturalist Theorizing. *European Journal of Social Theory*, 5(2), pp.243–263. Available at: http://est.sagepub.com/content/5/2/243.abstract.

Shove, E., 2010. Beyond the ABC: climate change policy and theories of social change. *Environment and planning. A*, 42(6), p.1273.

Shove, E., 2003. *Comfort, Cleanliness and Convenience: The Social Organization of Normality*, New York, NY, USA: Berg Publishers. Available at: http://site.ebrary.com/lib/surreyuniv/docDetail.action?docID=10060563.

Shove, E., 2012. Putting practice into policy: reconfiguring questions of consumption and climate change. *Contemporary Social Science*, 0(0), pp.1–15. Available at: http://www.tandfonline.com/doi/abs/10.1080/21582041.2012.692484.

Shove, E. & Warde, A., 2002. Inconspicuous consumption: the sociology of consumption, lifestyles, and the environment. In *Sociological theory and the environment: classical foundations, contemporary insights*. Rowman and Littlefield: Lanham, MD, USA, p. 51.

Spaargaren, G., 2003. Sustainable Consumption: A Theoretical and Environmental Policy Perspective. *Society & Natural Resources*, 16(8), pp.687–701. Available at: http://www.tandfonline.com/doi/abs/10.1080/08941920309192.

Wilk, R., 1999. Towards a useful theory of consumption. *European Council for an Energy Efficient Economy Summer Study Proceedings*.