Up, down, round and round: connecting regimes and practices in innovation for sustainability

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Abstract. The multilevel perspective and social practice theory have emerged as competing approaches for understanding the complexity of sociotechnical change. The relationship between these two different camps has, on occasions, been antagonistic, but we argue that they are not mutually exclusive. Indeed, through empirical analysis of two different case studies of sustainability innovation, we show that analyses that adopt only one of these theoretical lenses risk blindness to critical innovation dynamics. In particular, we identify various points of intersection between regimes and practices that can serve to prevent (or potentially facilitate) sustainability transitions. We conclude by suggesting some possible directions for further research that place these crossovers and intersections at the centre of analyses.

Keywords: sustainability transitions, sustainable innovation, local organic food, pro-environmental behaviour, multilevel perspective, social practice theory

1 Introduction
It is increasingly recognised that meeting the sustainability challenge will require innovation at a systemic level to fundamentally change the way things are done and how societal needs are created and met. In short, that incremental improvements in eco-efficiency will no longer do (eg, Grin et al, 2010). Within the nascent field of sustainability innovation studies, increasing attention is being given to two theoretical approaches which, whilst sharing a concern with systemic sociotechnical change, differ fundamentally in how they understand the processes through which such sustainability innovation does (or does not) come about.

The first of these is a multilevel perspective (MLP) which sees system innovation and transitions as emerging through realignments between the vertical levels of niche, regime, and landscape. This was originally proposed by Rip and Kemp (1998) and subsequently applied and developed most prominently by Geels (2011). The second is social practice theory (SPT) which sees innovation and stability in social practices, such as cooking, showering, or driving, as resulting from the horizontal circulation and integration of different elements of practice. This approach builds on the work of a long line of social theorists, including Bourdieu and Giddens and, more recently, Reckwitz, Schatzki, and Warde, but has most notably been applied to sustainability innovation by Shove, Walker, and Pantzar (eg, Pantzar and Shove, 2010; Shove and Walker, 2007, 2010). To date, and despite their shared concerns both with sustainability and with systemic understandings of innovation, these two approaches have been developed in mutual exclusion within two distinct, and occasionally oppositional, theoretical camps (eg, Rotmans and Kemp, 2008; Shove and Walker, 2007, 2008). There have been a few limited indications that exploration of the relationships and links between the two approaches might prove fruitful

(eg, Geels, 2011; Gram-Hanssen, 2011; Smith et al, 2010), but this challenge has not, to the best of our knowledge, been explored in any real depth.[1]

Therefore, we aim to address this intellectual and empirical challenge by identifying and exploring some potential links and connections between these two theoretical approaches as a means of deepening understanding of how sustainability innovations might develop. We apply a conceptual framework originally proposed by Shove (2003) that draws attention simultaneously towards the vertical relationships between levels of the MLP, the horizontal circulations of elements of practice, *and* the ways in which practices and regimes cross over and intersect with one another in innovation processes. We apply and develop Shove's framework to reanalyse two empirical case studies—Eostre Organics local food cooperative and the EcoTeams approach to pro-environmental behaviour change—that we ourselves have previously analysed using only one of these theories (the MLP and SPT, respectively). We argue that attending to the points of intersection between regimes and practices offers vital insights into processes that can serve to hinder (or potentially help) sustainability transitions.

The paper proceeds as follows: in section 2 we introduce the theoretical contexts both of the MLP and of SPT, showing how they have been applied to questions of system innovation, and introducing Shove's framework. We apply this to our empirical cases in section 3, and discuss the implications of this analysis in section 4, identifying the critical points of intersection between regimes and practices. We conclude by suggesting that, because of their ability to either help or hinder innovation processes, these points of intersection should become key foci in future research on sustainability transitions, and outline some directions and methodological suggestions for future research.

2 Transitions in regimes and practices
2.1 The multilevel perspective (MLP)
Geels describes the MLP as a theory that conceptualises the overall dynamic patterns observed in sociotechnical transitions:

> "The MLP views transitions as non-linear processes that result from the interplay of developments at three analytical levels: niches (the locus for radical innovations), socio-technical regimes (the locus of established practices and associated rules that stabilize existing systems) and an exogenous socio-technical landscape … . Each 'level' refers to heterogeneous configurations of elements; higher 'levels' are more stable than lower 'levels' in terms of number of actors and degrees of alignment between the elements" (2011, page 26).

The MLP describes how the three levels interact dynamically in the unfolding of sociotechnical transitions. A 'transition' is said to have occurred when there is a major change in the way in which particular societal functions (eg, energy, water, or food) are fulfilled or, in other words, when there has been a shift of 'regime'. In normal circumstances, 'regimes' change incrementally to become more efficient. Occasionally, however, realignments between the levels of the MLP result in more fundamental regime change. For example, although Geels and Schot (2007) highlight a number of different transition pathways through which such a shift might occur, transitions are conventionally seen as resulting from external 'landscape' pressures (eg, climate change or cultural shifts) exerting pressure upon incumbent regimes (eg, the fossil-fuel based energy system) to open up 'windows of opportunity' that might be filled by novel, radical, innovations developed in 'niche' spaces (eg, renewable energy technologies).

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[1] While this paper was under review, McMeekin and Southerton (2012) have drawn on a Bourdieu–Warde-inspired version of SPT, to make similar calls for a more detailed exploration of the crossovers between SPT and the MLP.

The MLP was developed through in-depth historical case studies—for example, of the transitions from horse-drawn carts to cars (Geels, 2005) or from cesspools to sewer systems (Geels, 2006)—but related theoretical ideas have been developed, especially in the Netherlands, for use as policy-making and management tools: for example, transition management (Kemp and Loorbach, 2006), and strategic niche management (Kemp et al, 1998). In particular, there is a great deal of interest in how such approaches might be used to try to steer existing unsustainable regimes in more sustainable directions. Here, the MLP points towards the importance for would-be transition managers of nurturing new innovations within 'niche' spaces, such as by providing various forms of 'protection' from mainstream markets and pressures; of seeking to influence landscape processes, for example, by trying to shift public attitudes or by interpreting landscape trends in ways that challenge dominant regimes; and potentially of trying to dismantle and reconfigure existing regimes, for example, through lobbying activities or proposing new standards and visions for the future (eg, Smith, 2012).

The MLP thus provides a relatively simple but highly flexible heuristic framework for exploring and seeking to influence transitions in particular societal functions and systems. Nonetheless, whilst it offers an extremely broad perspective that helpfully directs research and policy attention towards developments within and interactions between its different levels, it has not been free from the criticism that it overlooks crucial aspects of transitions processes.

A common critique is that the MLP exhibits a technological bias and that, because of this, it inadequately conceptualises actors and agency, being instead too functionalist, rationalist, and structural in approach (eg, Genus and Coles, 2008). We agree with Geels (2011) that this criticism is misplaced—the MLP is in fact "shot through with agency, because the trajectories and multi-level alignments are always enacted by social groups" (page 29)—nevertheless, we would also draw attention to the tendency not only to focus on innovations in technical artefacts, rather than on forms of 'social innovation', but also to identify and define actors somewhat narrowly, in relation to and in terms of only the particular sociotechnical regime under study. For example, as Seyfang and Smith (2007) highlight, MLP-based studies tend to stress the agency of dominant market and state-based actors and agencies in shaping transition processes, to the neglect of actors within civil society settings (a point which we seek partly to rectify in this paper by drawing on empirical case studies of civil society groups—see section 3). Further, by focusing on specific regimes, such as energy, food, water, or transport, the MLP has underplayed multiregime interactions and actors that cut across multiple regimes—a point that Geels himself recognises as an "understudied but promising topic" (Geels, 2011, page 32; although see Raven and Verbong, 2009).

Shove and Walker (2010) identify two further critical omissions that the tendency to focus on transitions in specific regimes causes MLP-based studies to overlook. First, that within studies using the MLP, "the *socio* element of *socio*technical change typically refers to the fact that innovations are shaped by social processes rather than to the ways in which technical systems are implicated in defining and reproducing daily life" (page 471, emphasis in original). Instead, by turning their attention towards everyday practices, they show how particular societal needs and functions are either maintained or evolve and change through the routine performance of social practices, such as showering or commuting, that involve the 'horizontal' (in contrast to the 'vertical' levels of the MLP) circulation and integration of elements which travel across and between specific regimes (see section 2.2). Second, Shove (2012) observes that, although the MLP is extremely valuable in helping to understand *novelty* and how new innovations within niches break through to form dynamically stable regimes, it has rather less to say about the dynamics of *normality*. Despite references to the strength or

weakness of structuration within the different levels (eg, Geels and Schot, 2007), the MLP's overarching focus on innovation and transition in specific regimes forces it to emphasise the new and the novel and, in so doing, to overlook the wider systems of systems that hold things in place and maintain normality (Shove, 2003).

In summary, whilst the MLP clearly offers a useful framework for understanding sustainability transitions in particular systems and regimes, we suggest that the account it offers needs extending further to account for activities that cut across existing regimes and systems, that engage more directly with people's everyday life practices, and which concentrate on normality as much as they do on novelty. Here, and as we discuss in the next section, recent work on social practice theory (SPT) is potentially helpful.

2.2 Social practice theory (SPT)

Whilst the MLP is concerned with transitions in sociotechnical regimes and systems, within SPT the focus of attention shifts to a different unit of analysis—transitions in *practices* (Shove, 2012). There remains "no unified practice approach" (Schatzki, 2001, page 2) and indeed many variants of practice theory have previously been expressed (for example, by Bourdieu, 1977; Giddens, 1984; Reckwitz, 2002; Schatzki, 2002); however, in this paper we adopt an approach developed by Shove and Pantzar (Pantzar and Shove, 2010; Shove and Pantzar, 2005a) as this has been recently applied to the topic of innovation in practice which is our core focus here.

Schatzki (2002) distinguishes between 'practices-as-entities' (idealised and abstract forms that are historically and collectively constructed) and 'practices-as-performances' (the grounded enactment of practices conducted as and amid everyday contingencies). The predominant focus within SPT, however, is on the 'doing' of the practices that make up normal everyday life, such as cooking, cycling, or showering, on the elements of which they are comprised, and on the ways in which these practices are socially organised. In an oft-cited definition, Reckwitz (2002) suggests that a practice is:

"a routinized type of behaviour which consists of several elements, interconnected to one other: 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. A practice—a way of cooking, of consuming, of working, of investigating, of taking care of oneself or of others, etc—forms so to speak a 'block' whose existence necessarily depends on the existence and *specific interconnectedness* of these elements, and which *cannot be reduced to any one of these single elements*" (pages 249–250, emphases added)

Reckwitz's emphasis on the elements of which practices are made has since been widely adopted. While different theorists offer different lists of ingredients [for example, see Gram-Hanssen (2010, page 154) for a comparison of Schatzki, Warde, Reckwitz, and Shove and Pantzar] we follow Shove and Pantzar's (2005a) version that sees practices as made up of 'images' (meanings, symbols), 'skills' (know-how, forms of competence), and 'materials' (artefacts, technologies) that are actively and recursively integrated through everyday performance. Shove and Pantzar's version stresses that practices are stabilised (or changed) through their repeated and more or less faithful performances by practitioners. For example, in the case of showering, every time someone has a shower he or she combines the images (cleanliness, freshness), skills (how to use soap and wash oneself), and materials (water, soap, shower cubicle) that make up the practice of showering and, through enacting this practice-as-performance, he or she either reinforces or modifies the links between the elements of showering as a practice-as-entity (cf Shove and Walker, 2010). Practices are thus formed, changed, and potentially 'fossilised' (Shove and Pantzar, 2005b) as the links between their elements are made, maintained, or broken. Accordingly, and as figure 1 depicts, it is possible
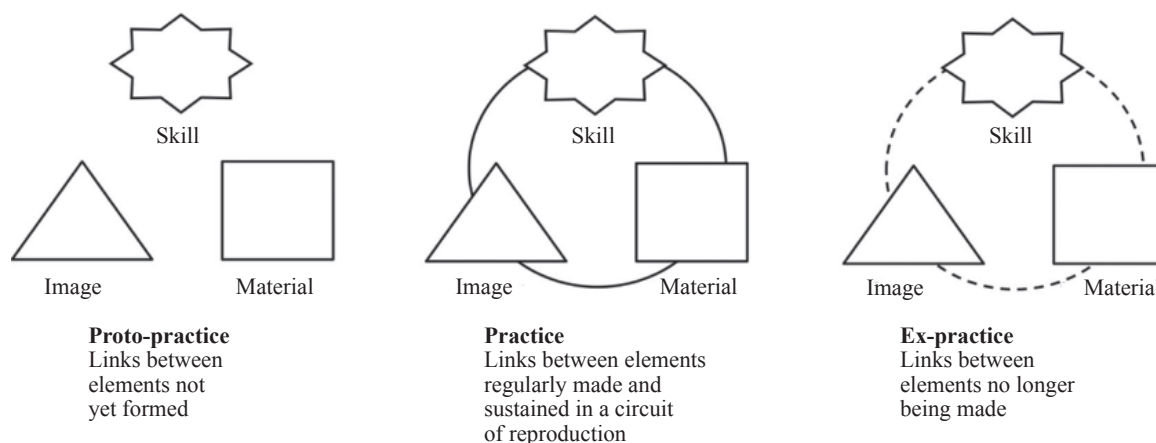
Figure 1. Proto-practices, practices, and ex-practices (source: Pantzar and Shove, 2010, page 450).

to draw an analytical distinction between different stages in the life of a practice: from 'proto-practices', in which the elements exist but are not yet integrated; through 'practices', in which the elements are regularly combined in performances; to 'ex-practices', in which the elements have become disconnected from one another.

By implication, although the stability and reproduction of practices result from the repeated integration of elements, innovation in practices derives from the making and breaking of links between elements (Pantzar and Shove, 2010). As Shove (2010) acknowledges, however, most of the work on SPT to date has focused on the reproduction of practices, rather than on the ways in which novel sustainable elements might be introduced or in which new and more sustainable configurations of elements might be generated [although see Gram-Hanssen (2011) for a recent discussion of the sources of change in practices]. Pantzar and Shove (2010, page 458), for example, highlight three distinct 'circuits of reproduction' through which practices are maintained and stabilised. The first circuit refers to how, despite their apparent autonomy, the elements of a single practice also appear to cohere and hold one another together. For example, particular materials (eg, laundry liquid) may become closely associated with particular meanings (eg, cleanliness) or skills (eg, using a washing machine). The second circuit concerns the relations between whole practices as they come to form interconnected practice complexes or 'systems of practice', such as the combination of complementary practices that occur in a single workplace or the relationship between driving practices and out-of-town shopping practices. The third circuit relates to temporal dynamics and path dependence, exploring how current practices evolved out of past ones and contain the seeds of future practice. For instance, in the case of a single individual's lifestyle, the practices she currently 'carries' (Reckwitz, 2002) will shape the kinds of practice she encounters in her daily life, just as they will shape her perceptions of, and ability to take up, new practices. These three circuits of reproduction thus emphasise the stability of practices and systems of practice, and the profound challenges likely to be involved in attempting to change them.

SPT thus departs from and extends MLP-based analyses in at least two crucial ways. First, SPT focuses its attention on normality rather than novelty. Instead of examining single innovation trajectories, SPT emphasises the many dynamics and circuits of reproduction involved as the multiple elements of practice are integrated in specific performances (Shove, 2012). This is a crucial addition to MLP-based analyses, but it is important to emphasise also that, as of yet, SPT is not especially well equipped to discuss the sources or emergence of novelty (Shove, 2012). Gram-Hanssen (2011) has recently developed SPT in this area, illustrating how change in practices can result from adjustments in the various elements

of which they are comprised (especially technologies) or from interrelationships between multiple interconnected practices, as change in one practice can affect others. Nonetheless, more work is required and, as such, the single-system focus and vertical levels of the MLP remain, for the time being at least, helpful in understanding where novelty and radical change may come from.

Second, by focusing on everyday doings, SPT calls into question the way in which the MLP draws boundaries around distinct systems and regimes. To use cooking as an illustrative example, whereas the MLP has variously been used to explore transitions in the energy, food, water, and/or transport regimes, each of which upholds multiple day-to-day practices, the single practice of cooking refuses to recognise these regime and system boundaries as, in the making of a single meal, practitioners draw upon, and thus reinforce or potentially challenge, all of these different regimes. Perhaps the most crucial distinction between SPT and the MLP, therefore, and the one that we will take further in the rest of this paper, relates to the horizontal nature of relations between practices in contrast to the hierarchical and vertical relations between the levels of the MLP. The MLP allows one to examine the emergence of novelty through the interactions between the vertically ordered levels of niche, regime, and landscape, while SPT focuses attention instead on the horizontal dynamics of practices that cut across multiple regimes as they follow their circuits of reproduction.

2.3 Connecting the MLP with SPT

In the preceding sections we have explored the distinctiveness of the analyses offered by the MLP and SPT; in this section we turn our attention to their similarities and to the ways in which they might fruitfully be brought together and connected. In seeking to draw together and connect these two distinct theories, it is important to be clear about the limits to our theoretical ambitions. Our aim in this section is not to integrate, fuse, or hybridise these two approaches into an overarching universal theory, for to do so would undermine the distinctive contribution that each makes alone. Instead, like Geels (2010), our aim is to explore the 'crossovers' between these two theories, to examine "interplay, not synthesis" (Geels, 2010, page 503) in order to see what SPT can add to the MLP and vice versa. We do this by, first, examining the similarities between the two approaches and, second, by reexamining an analytical framework originally proposed by Shove (2003) that, we argue, is capable of gathering together the benefits of each approach and thus provides a means to more fully understand sustainability transitions.

Perhaps the central similarity between the MLP and SPT, with regard to sustainability transitions at least, is that both recognise contemporary environmental and sustainability challenges as demanding fundamental systems change that cannot be achieved through incremental tinkering with existing systems. As Shove puts it:

> "relevant societal innovation is that in which contemporary rules of the game are eroded; in which the status quo is called into question; and in which more sustainable regimes of technologies, routines, forms of know how, conventions, markets, and expectations take hold across all domains of daily life" (2010, page 1278).

Both the MLP and SPT are 'middle-range' approaches that refuse to give primacy to either structure or agency in sociotechnical change processes, but instead focus on the dynamics of 'structuration' that drive both system stability and change (eg, Geels and Schot, 2007; Røpke, 2009). Further still, both theories recognise that these processes will involve multiple actors, will follow nonlinear trajectories, will display coevolutionary and emergent dynamics that proceed despite various forms of path dependency and lock-in, and therefore that, to the extent that governance is possible, it must necessarily take an adaptive and reflexive form (eg, Shove and Walker, 2007).

Given the large amount of overlap and shared interest between the two theories, it is therefore of no surprise either that theorists have sought vigorously to defend their distinctiveness and incompatibility (eg, Shove and Walker, 2010), or that more recent efforts have been made to integrate and hybridise these frameworks. Geels (2011), for example, has attempted to link the two theories by suggesting that the distinction between the levels of the MLP refers only to degrees of structuration and stability and that, as such, the vertical notion of a 'nested hierarchy' should perhaps be abandoned. Similarly, Smith et al (2010) have taken steps towards integration by arguing that SPT does in fact recognise different degrees of stability within practices and thus, in effect, already contains a 'vertical' dimension. Geels (2011) has taken this point still further to tentatively suggest that it might be possible to speak of regimes as 'stabilised' or routinised practices, and of niches as more emergent, fluid, practices.

These respective efforts to render the vertical horizontal and the horizontal vertical are valuable steps towards combining the insights of both approaches; nonetheless, they run the risk of underplaying the distinctive contributions made by each theory because they obscure the key difference between them: namely, they address different units of analysis, with the MLP concerned with transitions in regimes and SPT concerned with transitions in practice (Shove, 2012). Consequently, these integrative efforts potentially conflate distinct analytical approaches. Instead, we suggest, it is preferable, at least as a first step, to examine *both* how niches, regimes, and landscapes in particular systems interact with and impact upon multiple everyday practices, *and* how particular practices and systems of practice intersect with the dynamics of niches, regimes, and landscapes. In so doing, we follow a recent contribution by Gram-Hanssen who demonstrates that "change and stability in practices … spread[s] *both* horizontally and vertically" (2011, page 75, emphasis added). To help conceptualise this process, we are led to reexamine an analytical framework originally proposed by Shove (2003) (see figure 2).

This diagram suggests that fully understanding transitions demands simultaneous investigation along three distinct but connected lines of enquiry: (i) transitions in regimes as they occur through interactions between niches, regimes, and landscapes—the vertical circle; (ii) transitions in practices as they occur through change and continuity in different circuits of reproduction—the horizontal circle; and (iii) how regimes and practices interconnect with and bump into one another in the course of transitions processes—the points of intersection.

The preceding sections have reviewed work that investigates either the vertical or the horizontal circle and have pointed to some initial, tentative suggestions that further integration might be possible. To date, however, to the best of our knowledge, there have been no studies using an MLP-based approach that have systematically analysed how transitions in regimes influence bundles of everyday practices that are not regime specific. This is unsurprising for, as Shove (2012, page 53) notes, the MLP is "not designed to understand the dynamics of social practice." Clearly, we should not expect such analyses to get to grips with the everyday contingencies and negotiations involved in social practices.

MLP-based analyses could certainly go further to analyse practices that cut across regimes, and the same could also be said for studies that employ SPT. More progress has been made in this direction, however. In her research on indoor heating and cooling systems, for example, Shove (2003; 2012) has clearly traced the ways in which the contemporary housing regime has developed based on assumptions about the sorts of clothing people wear and the sorts of practices they are likely to engage in. Over time, these assumptions have become enshrined in building codes and regulations in the form of minimum and maximum temperatures which homes must be able to deliver all year round, further cementing the link between existing practices and the housing regime and, in the process, standardising 18–21 °C as the 'normal' indoor temperature all around the world. This work thus reveals the
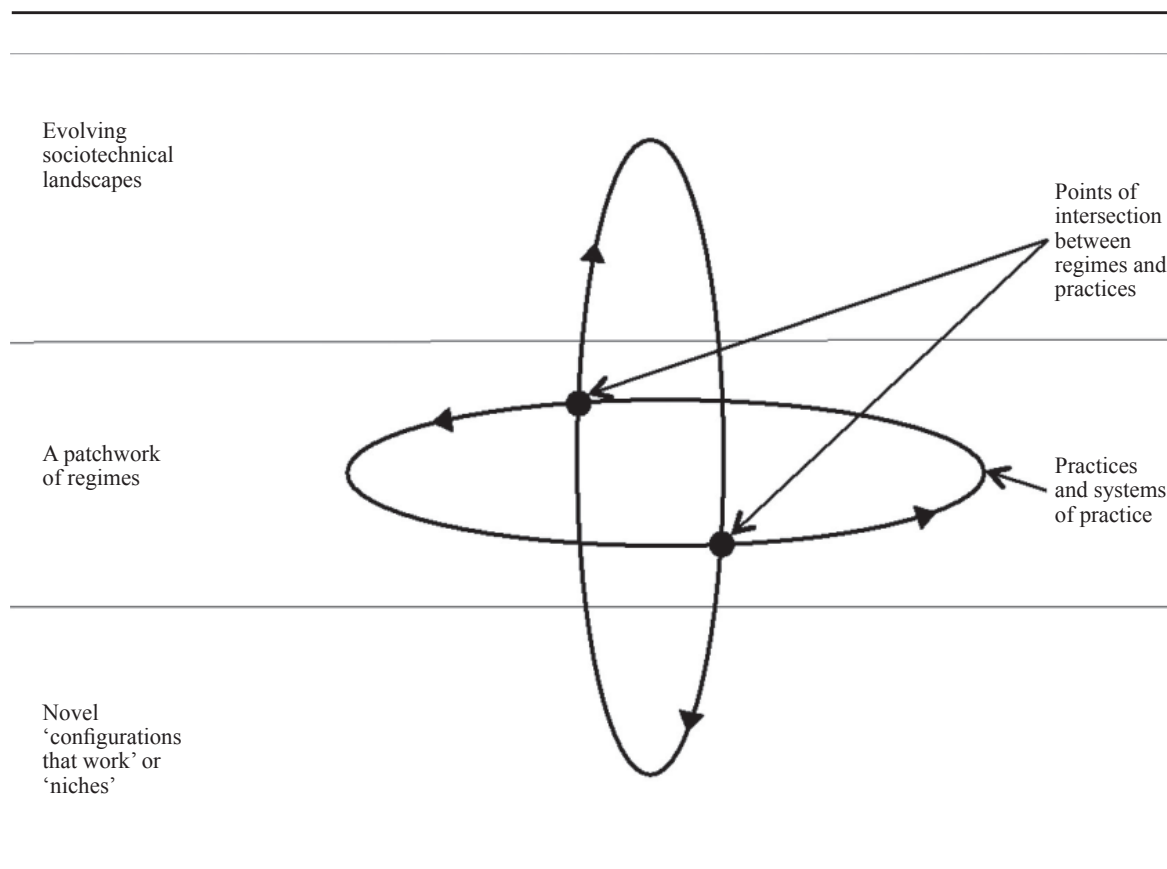
Evolving
sociotechnical
landscapes

Points of
intersection
between
regimes and
practices

A patchwork
of regimes

Practices
and systems
of practice

Novel
'configurations
that work' or
'niches'

Figure 2. Combining the MLP (multilevel perspective) and SPT (social practice theory) (adapted from Shove, 2003, page 193).

constant interplay between regimes and practices, showing how both are constantly made and remade in each others image.

Nonetheless, these promising trends in both SPT-based research and that based on the MLP do not (yet) amount to a systematic programme of research that explores how transitions in regimes and practices unfold in connection with one another. In particular, whilst research on either the vertical or horizontal plane is fairly well developed, very few studies have considered the points of intersection between these two planes or, in other words, how new regime innovations get taken up (or not) throughout the regime-crossing systems of practice that make up everyday life, or how change or stability in practices either contributes to or prevents transitions in specific regimes [although see Gram-Hanssen (2011) for a recent study seeking to address this issue]. In the next section we seek to begin this programme of research, and demonstrate the potential value it adds to research on sustainability innovation by using figure 2 to reexamine two empirical case studies from our previous research.

3 Case studies of innovation in regimes and practices
In this section we present a reanalysis of two empirical case studies of sustainability innovation: Eostre Organics (section 3.1) and the EcoTeams approach (section 3.2). Previously we have explored Eostre (pronounced 'easter') Organics using only an MLP-based approach (eg, Seyfang, 2009), and have explored the EcoTeams approach using only SPT (Hargreaves, 2008; 2011). Here, and for the first time, we systematically explore each case study along both the vertical *and* horizontal dimensions, and pay particular attention to the points of intersection between these two planes.

Both of these case studies highlight examples of innovation led by civil society and, while this is not the core focus of this paper, in so doing this section helps a little to redress an imbalance in the innovation studies literature that has seen a tendency to focus on

market-based or state-based innovations to the neglect of civil society action (eg, Seyfang and Smith, 2007). We would stress, however, that Shove's conceptual framework is potentially applicable to innovation occurring within any sector of society and, as such, would call for further case studies systematically applying and extending this framework in different sectors and to different forms of innovation.

3.1 Eostre Organics

Established in 2003 in Norwich, UK, Eostre Organics was a cooperative that drew together sixteen small-scale organic food producers, many of whom had previously suffered bad experiences dealing with the supermarket supply chain (eg, vulnerability to low and fluctuating prices). By coordinating themselves within a formal cooperative structure, these local growers aimed to by-pass the mainstream supermarket-driven food system by selling directly to local schools, businesses, and hospitals, and, through market stalls and mixed fruit and vegetable boxes delivered on a weekly basis, direct to individual consumers throughout the region. Eostre's stated aims were to generate a "fair, ecological and co-operative food system" that would deliver high-quality organic, local, and seasonal (where possible) or Fairtrade foods to consumers of all incomes by encouraging cooperative working between its members, rendering food-supply chains transparent, minimising packaging, waste, and transport, and raising awareness of the environmental and social aspects of food production (Eostre Organics, 2004). By 2004 Eostre was supplying produce to thirteen box schemes, fifteen market stalls, nine cafés, pubs, or restaurants, and twelve shops. It had also made inroads into public sector catering through local schools, hospitals, and prisons. This early success resulted in Eostre gaining media attention through celebrity chef Jamie Oliver's 'School Dinners' TV programme in which he sought to improve the quality of school dinners across the UK, and winning the Soil Association's Local Food Initiative of the Year award in 2003 (Eostre Organics, 2004).

In our previous empirical work with Eostre we have sought to evaluate the sustainable consumption impacts of the initiative, to measure its success and scope, and to identify the barriers preventing it from achieving its full potential. This was done through a mixed-method case study of the initiative, involving site visits and observation both of retail and of growing/ distribution locations, in-depth semistructured interviews with key actors in the organisation and related NGOs, and customer surveys to ascertain consumer motivations and feedback, from both market stall and vegetable box customers (see Seyfang, 2006; 2007a; 2007b; 2009).

Following Seyfang (2009), it is possible to use the MLP to analyse Eostre as part of a sustainable food niche aiming to bring about a sustainability transition in the mainstream, supermarket-driven food regime. As part of a sustainable food niche, Eostre can be seen as a small-scale sociotechnical experiment (cf Verheul and Vergragt, 1995) that aims to generate lessons about how food might be grown and distributed in novel ways, with sustainability values rather than the profit motive as its driving principles. As well as growing food organically and locally, Eostre also sought to generate alternative retail systems, selling directly both to institutional and to individual consumers as a means of increasing supply-chain transparency and reducing food miles. Eostre also sought to challenge what it perceived as the unsustainable aspects of the mainstream food regimes in various ways through, for example, lobbying activities to promote organic conversion and sustainable procurement, and also by working to set higher sustainability standards for more 'mainstream' produce— for example, by participating as a 'beacon of experience' in a trial aiming to supply school canteens with local food. Finally, Eostre also sought to influence landscape-level societal changes by distributing leaflets and newsletters about organic, Fairtrade, and local food to customers, and by organising educational visits to organic farms in an attempt to normalise and spread sustainability values more widely.

The MLP thereby serves as a useful analytical tool to analyse Eostre as part of an innovative and radical sustainable food niche, developing experimentally, and protected by sustainability values, in opposition to the perceived unsustainabilities of the mainstream food regime. Nonetheless, following its early success Eostre encountered a number of financial and managerial challenges, and eventually the retail business was closed in 2008 (although member growers continue trading). As an example of a novel food niche, however, there are some instructive lessons to be drawn about the potential for diffusion of such radical innovations. Ultimately, Eostre failed to generate enough income to maintain the business, and so attention turns to the reasons why the initiative initially grew quickly, then plateaued in terms of customer base and revenue—the niche was unable to diffuse through growth. This is where a practice-based analysis proves most useful, as illustrated through the following three examples in which we examine different aspects (images, skills, and 'stuff') of the new practices that Eostre aims to embed, through their intersections with different sets of practices such as 'growing food', 'shopping', and 'cooking'.

First, the social practice of growing food is one which involves agricultural producers across the UK, regulatory regimes, and options for retail outlets. In creating a niche system of food provisioning, Eostre sought to recruit local farmers to a reconfigured food-growing practice—organic production. This was initially successful to the extent that a small group of farmers were looking to expand this type of production: however, beyond this initial membership, Eostre struggled to shift growing practices and expand its number of growers. Although we lack data on the specific farms that refused to join Eostre, the literature on organic conversion does give some suggestions as to why this might be the case. For example, Padel and Lampkin (1994) suggest that one's perceptions (images) of organic farming constitute a critical issue, as is access to information about how to farm organically (ie, to address the lack of skills). Similarly, the lengthy organic conversion period can be costly and there can be concerns about the shortage of labour (Padel and Lampkin, 1994)—both important elements of organic agricultural 'stuff'. Whatever the precise reason, Eostre remained relatively small and imported food to supplement local produce; however, the range of food available was still less than that on offer in supermarkets, with implications for consumer shopping and cooking practices.

Second, the practice of shopping—which Eostre aimed to reconfigure—extends far beyond the purchase of certain items of food from particular retail outlets. In her customer survey, Seyfang (2007b) found that many supporters were frustrated by the difficulty of accessing the market stall (the 'stuff' of the niche system of food provision) during its working day opening hours, unlike supermarket channels of food provisioning which were more convenient (or, rather, the wider bundles of practices that constitute consumers' lifestyles imposed constraints over time use which precluded visiting the city-centre market stall). Customers furthermore needed to adopt new 'images' about fresh food, and be willing to accept a less aesthetically perfect standard of food presentation that would not be acceptable in conventional supermarkets. In addition, Eostre provided seasonal food, in contrast to the wide range available through conventional channels; moreover box scheme customers could not choose the contents of their weekly delivery. This represents a fundamentally different set of images and meanings around food, in terms of freedom of choice and consumer sovereignty, the available options, and so on, and for some customers this shift in expectations and meanings—firmly at odds with consumerist shopping practices for other items and in other contexts—was difficult to sustain.

Third, this lack of choice had important implications for the practice of cooking. For example, one customer stated "I never know what the box will contain, it's a challenge to my cooking skills!" (Seyfang, 2009, page 104). For this customer, the challenge was seen as a positive learning opportunity, but others may struggle to adapt their cooking practices

to the produce available in the boxes, which has led some vegetable box schemes to try to support customers through recipe cards or cookery lessons (Ellis, 2010). Institutional cooking practices were implicated too: for example, Eostre won a contract to provide the visitor café at the new Norwich Hospital, but it was unable to supply the patients (which would have been a major source of income) because the hospital was designed without its own kitchens, and so was forced to source cook–chill ready meals from central distributors.

In attempting to understand and analyse these challenges, we find the MLP somewhat limited in scope. In these cases, Eostre ran into difficulties because of social practices such as building design and architecture, working practices, and cooking practices which, although adjacent to and closely interconnected with the food system, extend far beyond it. Here, the MLP's detailed focus on the emergence of novelty within single regimes is limiting. What is required in addition is an understanding of how the sustainable food system that Eostre was experimenting with was or was not able to become integrated into preexisting practices and systems of practice, many of which have nothing ostensibly to do with food. Here, SPT's focus on the elements of which practices are comprised and how they circulate is helpful as it allows one to explore how Eostre Organics was generating new elements of practice, and how these did or did not get taken up in everyday performances. Figure 3 illustrates how these two systems intersect, and identifies some of the critical points of intersection where innovation in the food system is constrained by friction with systems of practices.
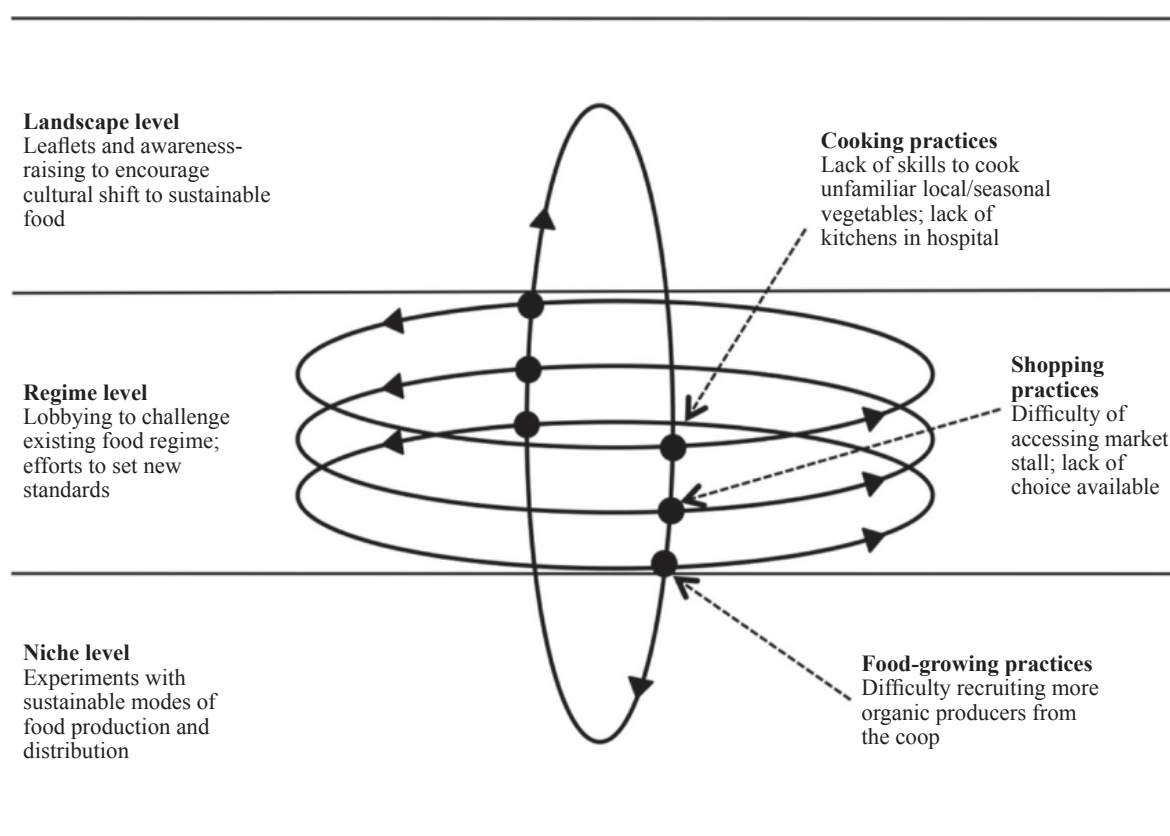

Landscape level
Leaflets and awareness-raising to encourage cultural shift to sustainable food

Cooking practices
Lack of skills to cook unfamiliar local/seasonal vegetables; lack of kitchens in hospital

Regime level
Lobbying to challenge existing food regime; efforts to set new standards

Shopping practices
Difficulty of accessing market stall; lack of choice available

Niche level
Experiments with sustainable modes of food production and distribution

Food-growing practices
Difficulty recruiting more organic producers from the coop

Figure 3. Intersecting regimes and practices in Eostre Organics.

Essentially, Eostre was inconvenient, and so, beyond a core of committed environmentalists who would willingly make those sacrifices, or had already adopted pro-environmental food-growing, cooking, and shopping practices, it simply did not fit with existing systems of practice at the level of individual lifestyles, and so did not catch on and spread more widely. Furthermore, while addressing the food regime, a practice-based analysis reveals how Eostre left other interrelated regimes untouched (for instance, the system of transport, or energy use

in the home) and these in turn restricted the scope for Eostre's disruptive practices to take hold.

The Eostre Organics case study reveals that a focus solely on innovations in regimes and systems risks missing the ways in which they intersect with practices and systems of practices that are ultimately crucial for the success or otherwise of the innovation. In short, a horizontal analysis of how specific practices cut across multiple regimes in the course of normal everyday life is required alongside the vertical analysis offered by the MLP. Our second case—EcoTeams—demonstrates that the opposite is also true: analyses that focus solely on innovations in practice risk missing the ways in which they intersect with wider regimes and systems.

3.2 EcoTeams

Run by the environmental charity Global Action Plan (GAP), EcoTeams are small groups of people drawn from within the same community—whether the same neighbourhood, social network, workplace, or school—who hold regular discussion meetings over the course of 4 to 6 months to analyse and seek to reduce the environmental impacts of their everyday lives. Each meeting has a different theme covering, variously, waste, shopping, energy, water, and travel, and on each occasion group members are asked to monitor their current practices by, for example, weighing their waste or monitoring their energy consumption, and then to discuss, learn about, and ultimately to try out more environmentally friendly alternatives.[2]

The empirical examples that follow are drawn from over six years of close engagement between the authors and GAP. Amongst other things, this has involved: an in-depth ethnographic case study (including nine months of participant observation and thirty-eight interviews with key participants) of the EcoTeams approach as it operated in the head offices of a construction company pseudonymously[3] called Burnetts; quantitative analysis of data from across all of GAP's EcoTeams-based programmes; and interviews with participants in GAP's domestic EcoTeams programme (eg, GAP, 2006; Hargreaves, 2008; Hargreaves et al, 2008).

EcoTeams have previously been analysed as a form of community-based social marketing via analyses using various social psychological ideas around behavioural intention, perceived behavioural control, social norms, and/or habit, to show how they do (or do not) influence individuals' behavioural decision making (eg, Barr, 2008).[4] In our previous research, however, we have shown that it is perfectly possible, and indeed beneficial, to analyse EcoTeams using SPT. In Hargreaves (2011), for example, it was shown how interpreting behaviour-change initiatives as attempts to intervene in social practices, rather than as interventions in individuals' behavioural decision making, provides a more holistic analysis that offers up more potential footholds for change (eg, around the images, skills, and stuff of practices, in addition to individuals' attitudes and values).

When analysed using SPT, the initial stage of the EcoTeams process—involving monitoring and auditing the environmental impacts of existing everyday activities—is interpreted as an effort to challenge the links between the elements of existing practices. In the Burnetts case, for example, the initial audit results—based on meter readings and physically weighing the waste produced in the workplace—led initially to expressions of shock and surprise at the size of the accumulated environmental impacts, which were then converted into a critique

[2] Although GAP runs several programmes under different names (eg, Environment Champions, Action at School), in this paper we use the term 'EcoTeams' to refer to the general group-based approach that underpins all of them.

[3] To preserve anonymity, Burnetts and all participants' names are pseudonyms.

[4] We thank an anonymous reviewer for this point.

of existing practices, identifying which elements had negative environmental impacts and needed replacing (see Hargreaves, 2011).

After this monitoring and auditing process has challenged and opened up practices in this way, however, the team meetings and resources then serve to try to reconstruct practices in more sustainable ways. The EcoTeams handbook contains countless ideas for new images, skills, and materials that might be incorporated into practices to reduce their environmental impacts. The chapter on energy, for example, as well as containing information about climate change (images/meanings), provides details of more efficient and sustainable domestic appliances, such as boilers, kettles, and forms of microgeneration (materials), and also makes suggestions for new skills that EcoTeamers might try to help them save energy, such as closing curtains, only washing full loads, or part-filling the kettle. By discussing and offering support on how to incorporate these new pro-environmental elements of practice into everyday life, the group meetings thus serve as fora in which new pro-environmental practices-as-entities are, at least discursively, constructed.

The next stage of the EcoTeams process involves trying to turn these discursive practices-as-entities into practices-as-performances. It is at this point that the limits of a horizontal, practice-based analysis are reached; and it is also here that many EcoTeam participants find the process most challenging. This is because this is the first point in the process at which the EcoTeam participants' new pro-environmental practices-as-entities come into contact with the wider systems and regimes that underpin and uphold the existing, 'unsustainable' ways of doing things. To provide three illustrative examples: first, in the Burnetts case study, despite the team members spending a considerable amount of time designing and planning for new waste-disposal practices that involved more recycling and less waste going to landfill, their proposed practices were thwarted by the facilities management team who cited legal frameworks around health and safety and data protection—key components of the existing waste-disposal regime—as reasons why existing practices could not be changed (much). Second, despite having been encouraged by the EcoTeam at Burnetts to try to change her commuting practices—by trying cycling to work—Leanne explains how her initial attempts were impeded by roads that she considered to be dangerous for cyclists and an inadequate public transport system:

"I have tried to cycle and it just scares me because there isn't any pavement or nothing at all … I find that I get sucked into lorry paths, or the cars go so quick … I've tried to get the bus and twice, or more than twice actually I've been let down by the bus, or the bus didn't turn up so I came to work late. So, because of that I thought 'right, that's it I'm going to take the car" (interview with Leanne, employee at Burnetts).

Third, participants in the domestic EcoTeams programme often reported a sense of frustration that wider systems and infrastructures were not more supportive of their efforts to go 'green', as ecoproducts may not be stocked in supermarkets, local recycling facilities may be inadequate for certain materials, and loans or grants for forms of insulation or microgeneration simply are not available. In each of these examples, efforts to reorient practices in more sustainable directions were severely hampered by wider systems and regimes (or elements thereof) that have developed over time to support a system of practices that is now perceived to be unsustainable and in need of change.

These examples show that EcoTeamers' efforts to change practices can easily be frustrated by the obduracy of existing systems and regimes, but the converse may also be true—that change in systems can facilitate changes in practices (cf Gram-Hanssen, 2011)—even if this is not, as yet, considered directly within the EcoTeams process itself. For example, after the formal EcoTeams process had ended at Burnetts a number of the team members were left frustrated that their efforts had seen only limited environmental savings—a 29% reduction in waste sent to landfill and a 5.4% reduction in electricity use (Hargreaves, 2008).

As a result, a small subteam was formed to take forward proposals to change the wider systems that had frustrated the team's efforts to change practices, such as through: solar panels on the roof, a rainwater harvesting system, or a car-pool or liftshare system. Similarly, anecdotal evidence from the domestic EcoTeams programme suggests that, after the process has ended, many EcoTeams continue to meet and indeed often turn their attention to more direct systems change: for example, by engaging in local politics or establishing their own biodynamic allotments (GAP, 2006). In both of these examples, frustration at how existing systems and regimes uphold unsustainable practices and thwart efforts to introduce more sustainable practices experienced during the formal EcoTeams programmes, is seen to lead to postprogramme efforts to introduce and experiment with new, niche innovations (whether these be new technologies or new social, political, and institutional arrangements).

This case study shows how attempts to intervene in practices and systems of practices through programmes such as EcoTeams soon run into trouble when they encounter the apparent obduracy of the wider systems and regimes that support and uphold the existing status quo. The limits of an SPT-based analysis, in isolation, are thus clear. In addition to understanding the dynamics and changing patterns of normal everyday lives, there is a need also to understand how novel sustainable systems and regimes might be created, and it is here that the MLP appears able to help. Figure 4 provides a simplified illustration of how, in the EcoTeams case, existing practices and regimes intersected and identifies some of the critical points of intersection where innovation in practice was hindered.
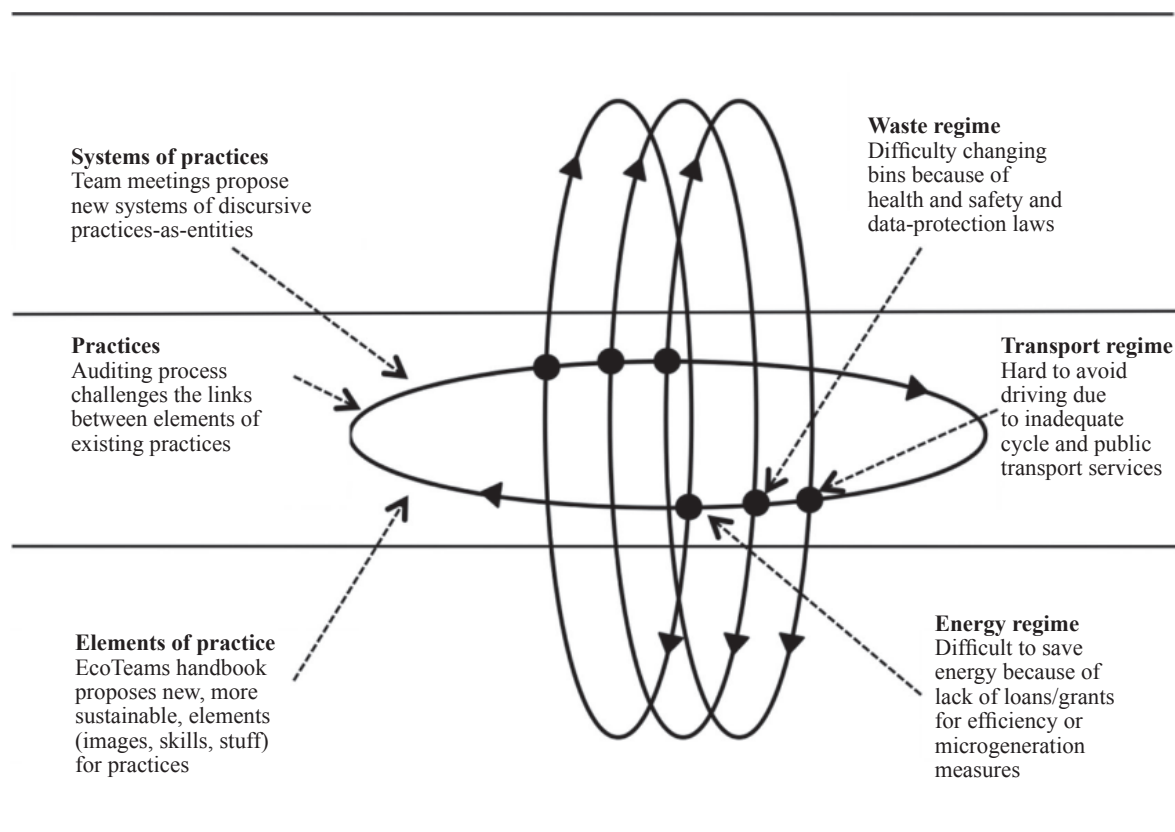

Figure 4. Intersecting practices and regimes in the EcoTeams Approach.

4 Discussion: examining points of intersection

Using Shove's framework (figure 2) has helped us to significantly advance our previous analyses of Eostre Organics and EcoTeams as innovations in regimes and practices, respectively. We had previously analysed Eostre Organics using only the MLP, but applying this combined conceptual framework has expanded our analysis to recognise that many of

the problems encountered by Eostre, in terms of its continuity and expansion, related more to how it connected up with and attempted to reconfigure a range of different everyday practices and systems of practices than to any particular problems with Eostre as a niche innovation in itself. Similarly, although our previous research had analysed EcoTeams as an attempt to intervene in particular practices and systems of practices, applying this conceptual framework has advanced our analysis to recognise that many of the difficulties EcoTeams encounter when trying to shift practices stem from the various systems and regimes that hold the existing status quo in place and, as a result, are not solely to do with the specific configurations of pro-environmental practices-as-entities that EcoTeams pursue and promote. The crucial point to emerge from these extended analyses and, as we see it, the core value added by applying this framework, is that deeper understanding of sustainability innovations and transitions—whether in regimes or practices—demands analyses that concurrently explore the vertical and horizontal planes in figure 2, as well as their points of intersection.

In the process of using Shove's framework to extend our prior analyses of Eostre and EcoTeams, our new analysis has revealed a number of different points of intersection between regimes and practices. For example, amongst others, the Eostre case uncovered cooking skills, hospital buildings, how shopping is fitted-in to everyday lifestyles, and the lengthy certification procedures for organic agriculture. In each example, these points of intersection hindered the wider development of Eostre as an innovation in the food system. Similarly, the EcoTeams case highlighted health and safety and data-protection laws, cycling infrastructure and public transport provision, as well as a lack of government support for energy efficiency and microgeneration as critical constraints on the wider diffusion of more sustainable and pro-environmental social practices. It is clear that practices and regimes intersect with and hold one another in place everywhere and all the time. However, from the perspective of sustainability innovations the crucial point of this analysis is to have identified what might be called the *critical* points of intersection: that is, those that constrain innovations—whether in regimes or practices—from emerging and taking hold within and across different times and places.

Importantly, this kind of analysis goes further than either MLP-based or SPT-based analyses conducted in isolation from one another as it reveals not one, but two, parallel (or, rather, perpendicular) tracks of path dependency. Regimes and practices are seen as overlapping and closely interlinked entities that hold one another in place and mutually coevolve. On the one hand, this kind of analysis makes attempts to bring about sustainability transitions—whether pursued through innovations in regimes or in practices—appear doubly difficult to achieve as regimes and practices are seen to crash into one another in a vicious cycle. On the other hand, and as the postprogramme developments in the EcoTeams case hinted, it offers a tentative suggestion that these constraining, critical points of intersection may be transformed into points of possibility at which new and more sustainable regimes and practices may symbiotically coevolve in a virtuous circle.

Further, it is already clear from just our two cases that critical points of intersection take different forms, encompassing physical artefacts and infrastructures, institutional and legal frameworks, as well as bodily–mental capacities. In this respect, applying this conceptual framework has helped to reveal some of the more subtle and implicit ways in which regimes and practices appear not only locked in (Unruh, 2000), but also locked together. Our previous analyses had highlighted some of the more explicit, direct, and perhaps obvious ways in which innovations in regimes or practices might be brought about or obstructed. For example, the ways in which Eostre tried to set new organic standards for the food regime and the financial and managerial difficulties it ran into, or the ways in which EcoTeams generated abstract and *discursive* practices-as-entities rather than concrete and materialised practices-as-performances. Using Shove's framework to generate

detailed analyses of the *connections* between regimes and practices, however, appears able to reveal a number of more subtle ways in which regimes leave traces in practices and vice versa. For example, such analyses may raise questions about how particular practices become enshrined in particular systems and infrastructures (eg, Shove, 2012); about how particular regimes contain legal rules that dictate how particular practices may or may not be performed; or even about how different regimes and practices may become embodied within individual practitioners. Here, for example, analyses may begin to explore the ways in which particular practices and regimes serve to discipline and govern their subjects (eg, Foucault, 1977), attempting to shape their thoughts, actions, and identities in ways that further enhance their stability and reproduction.

As these suggestions show, simply identifying the critical points of intersection between regimes and practices is already a significant advance on existing work that occurs within only one of either the vertical or the horizontal planes shown in figure 2. Shove's framework is relatively simple and attempts only to highlight the connections and crossovers between regimes and practices, rather than try to integrate or fuse these distinct analytical categories. Nevertheless, applying this framework makes obvious several critical points of intersection that would be obscured or even rendered invisible by analyses that followed only a single plane. Although this is a crucial first step, a number of important questions are immediately apparent that would require further systematic empirical analysis beyond that which we have begun in this paper. For example, how many different kinds of point of intersection exist and is it possible or meaningful to categorise them? Do different kinds exist across different times and places and is it possible to 'map' them? Are different points of intersection themselves related and interconnected and, if so, what is the nature of the relationships between them? What are the dynamics of change and stability in different points of intersection and what or who has responsibility for or the agency to change them? Our own work has employed mixed-methods case studies to begin to open up these questions, and future empirical research that applies this framework might make use of a wide range of different methodological approaches, including, for example, in-depth interviews, participant observation, questionnaire surveys, historical case studies, or various kinds of participatory workshops to generate scenarios, or test mapping and backcasting approaches (eg, Sondeijker et al, 2006). The crucial point in each case, however, is that empirically applying this framework demands the simultaneous and systematic exploration of innovation in regimes (the vertical plane), innovation in practices (the horizontal plane), and the spaces and times at which they come together (the points of intersection).

5 Conclusions

In this paper we have begun to expand analyses of sustainability innovations that occur on only one plane—whether vertical or horizontal—of the conceptual framework originally proposed by Shove (2003; and see figure 2). That is, we have suggested that analyses employing an SPT-based understanding of innovation in regimes can usefully benefit from the insights of MLP and vice versa. To demonstrate this, we used Shove's framework to reanalyse two case studies that we ourselves had previously understood to exist in only one of the two perpendicular planes. Our reanalysis has suggested that innovation in regimes can be held up and constrained, or potentially enabled and assisted, by a range of different everyday practices that are certainly not regime specific, and that innovation in practices can be frustrated or potentially facilitated by a range of systems and regimes that support and uphold multiple different practices. This reanalysis has allowed us to identify a number of different points of intersection between regimes and practices that, we feel, should become key foci for future research on sustainability innovation.

Our two case studies—Eostre Organics and the EcoTeams approach—are both examples of civil-society-led innovation and therefore help to address an important gap in the innovation studies literature (Seyfang and Smith, 2007); but it is also important to emphasise that the conceptual framework we have begun to develop and extend here can be applied equally across all sectors of society. What is needed now is many more case studies and examples that systematically apply and critically examine this conceptual framework across different contexts and forms of innovation.

It is important to restate the limits to our theoretical ambitions in this paper. Our aim throughout has been to explore the connections and crossovers between the MLP and SPT, rather than to try and fuse, hybridise, or integrate these two distinct approaches into a single overarching theory. We limit our ambitions in this way as a means of emphasising the distinct units of analysis which each theory addresses on its own and which, though they may overlap and connect in various ways, remain very far from congruent. Indeed, we would suggest that hasty attempts to integrate these two different approaches would risk losing their distinctive strengths. Instead, future analyses that attempt to apply this framework should retain the distinction between regimes and practices and actively explore the nature of the relationships between these two units of analysis as they intersect and cut across one another in the course of innovation processes.

Our central aim in this paper has been to begin to identify and explore the links and connections between regimes and practices in sustainability innovation processes. In so doing, we have sought to move beyond the apparent tribalism and occasional sniping between advocates of either the MLP-related or SPT-related approaches (eg, Rotmans and Kemp, 2008; Shove and Walker, 2007; 2008) by suggesting that, when combined with one another, both approaches appear able to offer a more thorough understanding of sustainability innovation processes. To conclude, we are not attempting to dictate where analyses of sustainability innovations should begin—whether from a focus on regimes or on practices in transition. Empirically, depending on the researcher's primary interest, such studies could commence from any point on either of the two intersecting circles shown in the diagram— from innovation in regimes or innovation in practice. The crucial point is that in the process of fully exploring either circle, the analysis will eventually encounter, and must therefore explore, the other.

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