

Situating organisational learning and public participation: stories, spaces and connections

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This paper gives one of the first in-depth ethnographic accounts of organisational learning in a public participation organisation, the UK Government-funded Sciencewise programme. It develops the concept of ‘organisational spaces’, highlighting the often diverse spaces found within organisational networks, and positing a co-productionist relationship between these different spaces and the kinds of learning processes that occur. The approach taken affirms the significant and active role of space in organisational learning processes, in a science policy context, as well as demonstrating the importance of connections between different organisational spaces in enabling more transformative learning processes. Two organisational spaces are described based on in-depth ethnographic and qualitative research in and around the Sciencewise programme 2013–2014. It is argued that informal, temporary and experimental organisational spaces have the potential to co-produce more transformative instances of learning, making an understanding of their connectedness to more formal and routinised organisational spaces vital for future research.

Key words organisational learning; organisational spaces; story-telling; public participation; organisations of participation

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Introduction

Organisational change is of vital interest to scholars engaging with pressing societal challenges. Recent work in the field of geography has been important in challenging assumptions about the nature of and possibilities for organisational change. Space and materiality have been key themes running through these interventions, emphasising the situatedness of organisational learning processes (Amin and Roberts 2008), exploring the potential for different kinds of organisational spaces to support different kinds of learning and change (Pelling *et al.* 2008), and affirming the active role played by space and materiality in organisational learning processes (Beyes and Steyaert 2012; Conradson 2003; McFarlane 2011b).

Geographers and scholars in cognate disciplines have shown particular interest in organisations at what has been characterised as the ‘science–policy interface’ (Demeritt 2010; Doubleday and Wynne 2011; Hinchliffe 2001; Kearnes and Wienroth 2011; Owens 2015), as objects of study and theorising, sites for intervention to improve policy processes and outcomes, and bodies coordinating everyday academic work (Pallett and Chilvers 2015). While the science–policy interface has

never been as clear-cut as the moniker suggests (Jasanoff and Wynne 1998), attention has increasingly shifted towards a consideration of the role of civil society actors in influencing and intervening in these organisations, for example through protests and social movements (Stewart and Aitken 2015), or invited deliberative public participation processes (Bickerstaff *et al.* 2010). With evolving demands for and modes of democratic engagement and constantly dynamic relations between science, technology and society, science policy organisations must be responsive and adaptable. Some have suggested even that they must have the capacity to learn and be reflexive (e.g. Bickerstaff *et al.* 2010; Gottweis *et al.* 2007). However, in the face of ongoing calls for organisational learning, reflection and reflexivity, it has been argued that policy and scientific organisations continually fail to learn from past experience, to reflect on their practices and assumptions, or to be open to uncertainty, surprise and indeterminacy (Wynne 2006).

This paper focuses on the case study of the UK Government’s public participation expert resource centre, the Sciencewise programme: an arm’s length Government body running since 2004. In its aim to promote and support the practice of ‘public dialogue’

in and around UK science policy, Sciencewise is one of a growing number of ‘organisations of participation’ (Pallett 2015) that have emerged as part of the broader institutionalisation of deliberative public engagement. Its structure as a sub-contracted body of Government, managed by a non-governmental body but with input from ministers and civil servants, and run on a series of three- to four-year contracts, is also an increasingly common organisational form at the science–policy interface. The paper draws on in-depth ethnographic research that explored organisational learning processes in and around the Sciencewise programme 2013–2014, to explore how and what the programme learned from and about public participation processes.

The first section of this paper develops a co-productionist framework for understanding organisational learning, emphasising the relational and situated nature of organisational learning processes occurring in and between different organisational spaces. The remainder of the paper puts this framework into action, describing first the methodological approach taken. In keeping with the relational and situated understanding of learning, the following section offers thick descriptive accounts of two organisational spaces and significant processes or features of organisational learning observed during the period of research. This is followed by an analysis of the relationships between organisational learning processes and organisational spaces that these stories reveal, and an exploration of the importance of the connections between organisational spaces. The conclusion considers the broader implications and potential contributions of this conceptual framework, for how geographers study and engage with organisational learning and change. The central argument of the paper is that organisational learning at the science–policy interface is a highly situated process that varies across different organisational spaces in the same network or assemblage. Characteristics of organisational spaces are co-constituted with organisational practices, actors and understandings, through processes of organisational learning. In addition, it is the connections between different organisational spaces that are often most important in understanding the dynamics of organisational learning.

A situated co-productionist framework for learning

This section draws on recent geographical scholarship concerning learning and the geographies of knowledge to inform a co-productionist framework for organisational learning. This approach focuses on situated practices as the locus of learning, through which skills, routines, assumptions, material objects, working understandings and problem definitions are co-produced with organisational structures and organisational

spaces. This is offered as an alternative to approaches that take for granted existing analytical categories of learning – such as single and double-loop learning (Argyris and Schön 1996), instrumental learning (Petts 2007) and transformative learning (Mezirow 1997). The co-productionist idiom (Jasanoff 2004b) provides a flexible framework for understanding the co-existence of instances of change or transformation, and instances of stability or immobility in the organisational network. It also underlines a relational understanding of organisational learning where transformations in one organisational space are co-emergent with processes in other spaces and with broader organisational structures. As will be detailed below, the approach taken here has also been inspired by Colin McFarlane’s work on ‘(urban) learning assemblages’, particularly his argument that ‘[t]he different “parts” of a learning assemblage do not interact atomistically but as co-constituting relations that define one another’ (2011a, 27). The co-productionist approach employed in this paper does similar work to McFarlane’s learning assemblage concept, but more strongly emphasises the stabilities that are produced through organisational learning processes, not only the transformations.

Organisational learning is frequently equated with ‘knowledge management’; the production, ordering and storing of knowledge (Amin and Roberts 2008; Cook and Brown 1999). The work of classification and the continual renegotiation of categories for understanding the world and organisational problems are central to organisational practices and change, and to the management and movement of knowledge through organisational structures (e.g. Bowker and Star 1999; Desrosières 1991; Douglas 1986; Epstein 2007; Hacking 1995; Jasanoff 2011). Similarly, the creation of standards is an attempt to make sense of messy organisational realities through the creation of often apparently trivial rules, benchmarks and ways of doing things, which might nonetheless have important ramifications for the conduct of everyday tasks (Star and Lampland 2009). Classificatory systems and standards change and are renegotiated sometimes as a result of external developments that transcend or challenge existing classifications, or might also be the result of internal renegotiations in response to perceived organisational failures or new visions of organisational aims. Other work has been interested in how organisational knowledges are codified and travel. Latour (1990) has described ‘practices of inscription’, such as the creation of visualisations or numerical results from laboratory experiments. The resultant inscriptions are attempts to synthesise and make universal the situated knowledge that has been produced and, if successful, Latour (1990) argues, they become ‘immutable mobiles’, able to unproblematically travel to and have meaning in different contexts, within or outside a given

organisational network. While these approaches provide greater specificity about different learning processes, it has been criticised for taking for granted or conceiving too narrowly of knowledge, its production, movement and mutation (Cook and Brown 1999; Hellström and Raman 2001).

The study of organisations in science policy has been further influenced by a move in Geography, Science and Technology Studies (STS) and related disciplines, towards a focus on procedures and dispositions over outcomes, and a conviction that the phenomena studied should be conceived of as being in a constant process of becoming rather than as fixed entities (Gieryn 1995). This development has supported and enabled the more specific turn towards processes and practices, strongly displayed in work in STS and Geography. The notion of 'co-production' has played a particularly significant role in this body of work (Jasanoff 2004b), elaborating how identities, institutions, discourses and representations can be mutually constructed. The new attention to processes and contingency (Irwin 2008; Owens 2010; Stirling 2006) suggests a way of viewing organisations as objects constantly in the process of becoming – dynamic, multiple, performative and open-ended – resulting from networks of different practices of organising and knowing (Beyes and Steyaert 2012; Jasanoff 2004a). For example, McFarlane's model of the city as a 'machine for learning' (2011b) describes learning as a process of translation, co-ordination or ordering, and shifting not only knowledge but ways of seeing and being (McFarlane 2011a). By recognising the practised and performative nature of organisational routines, structures and objectives, social scientists have been able to capture not only the potential for dynamic and sudden organisational change, but also the apparent solidity and stability of such forms as part of the everyday (Gherardi 2009; Jasanoff 2005).

The storage and accessing of knowledge within organisations is often referred to as organisational or institutional memory and can take many different forms. On the most basic level, organisational memory can be stored and accessed through inscriptions in the form of documents containing, for example, project outputs and lessons learned. The memories of individuals within an organisation are also a component of this broader memory (e.g. Argote and Miron-Spektor 2011; Gherardi 2009), and can be accessed through more informal discussions, anecdote and the travelling of certain narratives. Organisational routines and practices are a further locus of organisational memory (e.g. Levitt and March 1988; Schatzki 2006), incrementally incorporating new knowledge, skills, assumptions and problem definitions, and being constantly re-accessed through their repetition. An arguably more generative form of organisational memory is the organisational

narratives and stories discussed above (e.g. Garud *et al.* 2011; Linde 2009), which simultaneously store and transmit past knowledge and assumptions. Organisational memory in all of these different forms is never a fixed object, but rather is mediated through the ways it is stored and accessed, and will also be constantly reworked for different purposes in the present (Linde 2009). The literature on the geographies of knowledge highlights the role of particular spaces and places in shaping the production, circulation and reception of knowledge (e.g. Livingstone 2003; Powell 2007) animating Donna Haraway's (1991) concept of 'situated knowledges'. This suggests that organisational knowledge – including skills, practices, memories, routines and assumptions – both shapes and is shaped by organisational spaces in its production, circulation and reception, rather than travelling smoothly in 'immutable mobiles' as Latour (1990) suggests.

Story-telling and narratives within organisations offer an alternative way of understanding the storage, transmission and translation of organisational knowledges. Organisational story-telling has been described as a way of capturing the fluid and often fleeting way in which knowledge travels through organisations (Brown *et al.* 2005). Story-telling or the development of collective organisational narratives may also be generative of knowledge (e.g. Cook and Brown 1999; Garud *et al.* 2011), and form a way in which such organisational knowledge can be stored, accessed and transmitted (Linde 2009). In relation to an understanding of organisational spaces as dynamic and potentially fleeting, recent geographical work has explored how stories can capture and express more ephemeral elements of personal experience (Cameron 2012). Stories or narratives themselves may function like Latour's mobiles, persuasive and flat representations of the knowledge generated by a particular organisational event or process that can travel into other contexts. However, as they are mostly transmitted verbally and rest on highly contextualised or even embodied understandings and assumptions, stories will be mutable to an even greater extent. An approach focused on narrative can also help to capture the multi-vocality of learning, showing the presence of multiple, often competing narratives and ways of explaining or connecting certain chains of events, both organising and making sense of organisational knowledges (Weick 1995).

Learning processes are shaped both by memories and by imaginaries or visions of the future. Such imaginaries provide a sense of direction for learning processes, but not one that is fixed and absolute because imaginaries are also open-ended and mutable, changing as a result of external events and learning processes. McFarlane (2011b) also argues for spaces that can foster alternative imaginaries, in his case of urban learning, making an argument for the value of

Callon *et al.*'s (2009) hybrid forums. Jasanoff and Kim define socio-technical imaginaries as 'collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects' (2009, 120). Taylor's (2002) definition of social imaginaries is broader and could potentially apply to multiple scales, describing them as the ways in which people imagine their social existence, incorporating relationships to others, normative expectations and other elements. Thus imaginaries at the level of the organisational network or the organisational space could be described as being co-produced with other elements, such as identities (e.g. Horst 2007), working understandings of and approaches to the task in hand (e.g. Ellis and Waterton 2005), and interpretations of organisational memory (e.g. Linde 2009; Schatzki 2006).

Recent work concerning organisations in Geography, STS and beyond has drawn on organic metaphors of organisational structures seeking to promote a vision of organisations in science policy and elsewhere as much more dynamic entities with more porous boundaries. There has been a shift in focus in Geography and related disciplines from fixed and predefined entities to looser and more flexible networks, which contain both human and non-human elements (e.g. Callon *et al.* 2009; Hinchliffe *et al.* 2005). In studies of organisations, this has motivated a shift away from a focus on purely internal organisational trends and changes to an awareness of broader trends and influences, external to any given organisation (e.g. Irwin and Michael 2003; Hinchliffe *et al.* 2013). Furthermore, this conceptual work helps to explain empirical observations of how issues and actors often transcend what are assumed to be stable organisational boundaries and definitions (Doubleday and Wynne 2011; Owens 2010).

This networked approach also encourages a consideration of an organisation's material components and their relationship to social actors and practices, but has not always adequately dealt with the space or spaces of organisations or provided ways to conceptualise their character and effects. An important contribution was made by Pelling *et al.*'s (2008) concept of 'shadow spaces' that they found across the formal and informal structures of climate policy projects. These were relational spaces that formed part of broader organisational networks and allowed for forms of experimentation, imitation, communication, learning and reflection, which had not been possible within more formal structures. Pelling *et al.* (2008) argued that these shadow spaces provided adaptive capacity for organisations involved in UK climate governance that they would not have otherwise had, with important implications for broader learning.

These authors did not, however, fully elaborate what the role of space was in the shadow spaces or systems

that they identified. Useful guidance in pinning this concept down can be drawn from McFarlane's (2011a) learning assemblages where he similarly describes particular 'environments' that might be able to support progressive learning, highlighting the potential for learning processes and environments include multiple actors in their learning processes, but also political and ideological elements. Philo was one of the first to use the term 'institutional spaces' (1997), playing on the usage of the term institution to refer both to asylums or other mental health facilities and organisations. Together with Parr (Philo and Parr 2000), this concept was elucidated further to argue that institutions/organisations are geographical accomplishments, made up of material artefacts and forms of social ordering, but also micro-geographies that were more fluid and flexible. Understandings of institutional spaces of care have been further developed in the welfare literature, including studies of institutions providing care and support for asylum seekers (Darling 2011), people with mental health problems (Parr 2000; Wilton and Evans 2016), people dealing with addiction problems (DeVerteuil and Wilton 2009; Wilton and DeVerteuil 2006) and homeless people (Evans 2012). What unites these studies is an insistence on the multiplicity and ambiguity of institutional spaces of care, characterised by a subtle interplay between practices of care and control in different encounters (Evans 2012), and the sometimes contrasting aims and understandings of the actors engaged in these spaces (DeVerteuil and Wilton 2009). Another useful concept for thinking about organisational spaces that comes from the policy learning literature is the idea of a community of practice (Lave and Wenger 1991) that describes the often tacit and practice-based nature of learning in particular contexts, and helps to explain how certain ideas and assumptions can come to be shared among a particular community (e.g. Amin and Roberts 2008).

It is now axiomatic in Geography and related fields to acknowledge that space is not a passive static background on which societal events are played out (Soja 1989). The importance of recognising the dynamism, fluidity and multiplicity of space and spaces has been underlined (Massey 1994), as well as the impossibility of theorising space as entirely separate to time (May and Thrift 2001). With regards to understanding organisational spaces, Conradson (2003) has urged geographers to study the doing or practising of organisational spaces (or space-times), to capture their embodiment and fleeting atmospheres, rather than simply describing events and characteristics. More recently mobilities scholars have developed on the insight that spaces are constructed through their relations with other spaces and objects (e.g. Massey 1994) to understand the mobility or immobility of spaces and their features as being produced through

these relations (Cresswell 2010). Discussions about the extent and limitations of time-space compression have also been developed through this literature, considering how new technologies for transport and communication have contributed to increased mobilities and collapsed distances in particular contexts and for particular actors, with implications for processes of learning.

On the basis of the literature reviewed in this section, organisational spaces can be defined as physical, metaphorical and virtual spaces that form part of an organisational network or assemblage. Furthermore, they can be understood as being co-produced with organisational identities, practices, memories, assumptions and imaginaries through processes of learning. This concept is particularly useful for studying public participation at the science–policy interface because the institutional contexts and therefore the highly situated nature of public participation practices have not been taken seriously in academic studies of public participation except for in a handful of cases (e.g. Bickerstaff *et al.* 2010; Pallett and Chilvers 2013).

Sciencewise spaces of learning

Research design and methods

The situated co-productionist approach taken in this study emphasises the importance of understanding the settings and material elements of multiple organisational learning processes, as well as the processes themselves. The specific context of each narrative or process of learning is not just a substantial influence on the character and outcomes of learning processes, but rather a fundamental constitutive element of learning processes. Furthermore, learning processes, such as the development of new ideas and skills, the overturning of old assumptions, changing orderings of organisational knowledge or the development of new organisational routines, in turn influence and change their contexts or spaces, meaning that it is a co-productive relationship. Methodologically, this necessitated the careful identification and situated study of different organisational spaces in and around the Sciencewise programme, to capture the diversity of organisational learning processes and to identify potential connections or broader patterns.

Multi-sited ethnography (Marcus 2007) is a methodological approach increasingly drawn on by STS scholars as they move out of the laboratory to study the more diverse locations of science and science policy (e.g. Ellis and Waterton 2005; Gehrke 2014; Scott and Du Plessis 2008; Thompson 2004). Multi-sited ethnography methods have typically been justified pragmatically as a way to gain understanding of processes that are themselves multi-sited (e.g. Hinchliffe *et al.* 2013; Thompson 2004), and also to give the researcher rich

and varied data in circumstances where a more conventional ethnography might not be possible or permitted. In the case of Sciencewise, the organisational network had no single physical location, with the staff spread between a number of different sites and organisations, including a sizeable proportion who were self-employed, and there was no Sciencewise staff member who worked full time for Sciencewise. Thus a more conventional approach to organisational ethnography was not possible in this study.

To study these organisational spaces, participant observation was adopted when possible and permitted by Sciencewise actors, and was then followed up and enriched through semi-structured interviews with actors associated with each space, attempting to get good coverage of different kinds of roles within and around Sciencewise. This observation took place through attendance at scheduled meetings and events, as well as membership of one of the programme's online communities, as the multi-sited nature of the programme meant that extended observation in one workplace would not have yielded a full understanding of organisational activities. The researcher usually attended these events as a guest of the programme, but took a more active role in some meetings, for example acting as a scribe in a Sciencewise-supported Government horizon-scanning process and contributing to group discussions in a programme strategy day. A formal agreement was drawn up between the researcher and the programme before the research commenced in order to formally grant the researcher access to internal processes and to ensure that the research did not breach commercial confidentiality considerations. Full ethical approval for this work was granted by the researcher's University on the condition that interview and observational data were fully anonymised and stored in a secure manner. For this reason the data used in this study have not been made available in an open repository.

In total 27 people were interviewed, with different relationships to the programme. This included coverage of the main organisational roles within the programme and the three main organisations involved in its day-to-day running, including formal management actors, policy-makers overseeing the programme, individuals in steering and advisory roles, contractors who worked with the programme, independent dialogue and engagement specialists who oversaw projects on behalf of the programme, and individuals from related organisations who had co-organised events and projects with the programme. Through interviews and participant observation, the researcher met virtually everyone involved in the programme during the period of research. This sustained engagement with the programme lasted from the beginning to the end of 2013, with some additional data being collected in 2014.

Document collection and analysis, including official documents, internal documents, preparatory materials for events and online materials such as blog posts, were also used to supplement understanding of the spaces under study and to follow how certain ideas travelled and were refined. Documents were found through the websites of the organisations involved, including Sciencewise's own website, through their relationship to particular events studied, and through the use of less formal online methods, including following the main Sciencewise actors on Twitter and LinkedIn and through following the Twitter hashtags for relevant events. These online materials themselves also served as objects for analysis. All of the data collected were analysed inductively using the qualitative data analysis software ATLAS.ti. This inductive qualitative analysis was structured through the four initially identified organisational spaces and by several sensitising concepts (Blumer 1986), including learning, reflection and reflexivity. It is the combined insights from these three primary forms of data collection that forms the descriptions below. Due to issues of confidentiality and so as not to over-burden the narrative, documents, participant observation notes and interviews are not always fully referenced in the narratives below; however, important points are backed up with appropriate evidence.

As is generally acknowledged in constructivist work, the researcher can never be completely detached from the phenomena being studied, but rather will have effects through the kinds of questions asked, the relationships formed, methods used and even the fact of research itself (e.g. England 1994). The situated and relational perspective developed in this paper draws attention to the potential effects of my role as the researcher within and around Sciencewise, and the potentially arbitrary way in which I have created boundaries around or ascribed coherence to particular organisational processes in order to present a readable and credible account. I also had more material impacts on the narratives, through my physical presence at many of these events as an ethnographer and, in some cases, an active participant. Initially, four potential organisational spaces were selected for study, to guide the selection of opportunities for participant observation and interview participants, and further organisational spaces emerged during the period of research, both as a result of events during 2013 and the researcher's increasing familiarity with the programme's organisational networks and activities.

The organisational spaces described are not wholly defined materially – none were entirely contained in one geographical location – but combined material and abstract elements (cf. Livingstone 2003). They were considered as more or less coherent organisational spaces through the way they were described to the

researcher by the actors involved and how they were delineated in accounts of Sciencewise's organisational structure. Often this meant that projects or established organisational routines or hierarchies were judged to be distinct organisational spaces. Below are stories of two significant and contrasting organisational spaces studied. These stories are offered as a device for presenting the richness of the data collected in an accessible manner, and also inevitably reflect the stories told about organisational spaces in and around Sciencewise, and those that were told to me as a researcher. The use of stories to present initial findings then also tries to capture the multivocality of learning processes as noted above, and introduces some ambiguity in the interpretation of these processes by making clear the role and voice of the narrator (cf. Cameron 2012). The subsequent two sections then analyse the different kinds of learning processes occurring in and with different kinds of organisational spaces, to identify broader trends and movements, and to consider the importance of connections between different organisational spaces.

Organisational spaces

Management space

The Sciencewise management structure consisted of employees of the three organisations running the programme – the private consultancy Ricardo-AEA, the 'think and do tank' Involve and the British Science Association (BSA) – as well as civil servants from the Department for Business Innovation and Skills (BIS), self-employed specialists and external actors who made up the steering and citizen groups.

The highly distributed organisation of the Sciencewise programme, between different organisations, geographical locations and activities, was consistently referred to by Sciencewise actors as a challenge to management, and to the flow and ordering of organisational knowledge. For example:

we're getting better at it ... we found it a struggle at the beginning to have ... with our internal team communications ... you know, we're a team that's quite widely spread out. (Sciencewise management actor and Ricardo-AEA employee, 9/10/13)

Another participant framed this differently:

I think there are some issues about communication. And it's not ... it's not about everybody talking to each other all the time, it's about ... how things are decided and on what basis. (Sciencewise management actor, self-employed, 13/11/13)

Though central Sciencewise management actors were in constant email and telephone contact with one another about operational issues and queries, many rarely saw each other outside of monthly Sciencewise meetings. Opportunities for informal interactions around these meetings were also minimal as

management meetings were usually held at the relatively small Ricardo-AEA London offices, with participants from the BSA and Involve often in a hurry to get back to their usual offices in different parts of London afterwards, and some joining meetings via Skype from the Ricardo-AEA offices in Harwell or from their own homes outside of London. This led to a feeling in many of the interviews and in informal discussions I witnessed that many Sciencewise staff members only had an awareness of the Sciencewise activities they were directly involved in, and that knowledge about other projects and even strategic priorities was quite vague.

In an attempt to compensate for these apparent short-comings in the organisational structure, online knowledge management and contact relations management systems were instituted by Ricardo-AEA that Sciencewise actors were expected to consistently update with copies of documents they were working on and their networking activities. In practice, many Sciencewise actors experienced technical difficulties in using the software, especially those using Macbooks, or simply did not update the systems as often as was expected. As a result, the documents that were shared were often shared instead through mass email, which did not always include every staff member, and details about contacts and networking were shared through word of mouth or not at all. For example:

[w]e've got a CRM [contact relations management] system ... it's taken us a while to get that up and running, it's still not ... it's still not perfect. Actually capturing internal information and capturing actually external information as well ... and ... shepherding that into a usable form that we're getting the greatest benefit from has been a challenge. (Sciencewise management actor and Ricardo-AEA employee, 9/10/13)

Other attempts were made to create connections between different Sciencewise management and activity spaces, for example using key individuals as nodes to link between different groupings, sharing minutes from all meetings internally, and providing a buffet lunch in between the citizen group and steering group meetings to encourage people to meet and get to know each other. However, such initiatives were seen as having limited success, due to over-reliance on certain individuals, or people's lack of time and interest.

In 2013 the Sciencewise management teams embarked on a 'theory of change' process, culminating in the Sciencewise team day in December of that year. The idea of running a theory of change process originated in the February 2013 steering group meeting during a discussion of the approach to the whole-programme evaluation by a member of the steering group who felt that Sciencewise needed a more nuanced framework for understanding change and its own impact (Sciencewise 2014). The steering group

member felt the programme evaluations were too instrumental, lacking a sense of clear collective objectives around which desirable outcomes and ways of measuring them could be identified. While some Sciencewise actors, including members of the steering group, mentioned in interviews and other encounters that they were sceptical about the use of such an instrumental procedure for defining programme aims and activities, the idea was enthusiastically taken up by some members of the management structure who saw it as a way of defining collective priorities for 2014, the final year of the programme contract, and even setting an agenda for future iterations of the programme.

External practitioners were commissioned to run a one-off theory of change workshop in October, involving most of the Sciencewise management team, two dialogue and engagement specialists, one member of the citizen group and two members of the steering group. This workshop was run in a participatory style, with lots of group work, post-it notes and flip chart paper, and was held in a hired space in central London, rather than the usual Sciencewise meeting rooms. The outputs of the workshop were then discussed in the subsequent meetings of the dialogue engagement specialists, the citizen group and the steering group during October, and were then amended to include these additional perspectives. The activities identified through this process were then prioritised in another facilitated process as part of the yearly Sciencewise team day in December 2013, which was again run in a participatory style and in a hired venue.

The central feature of the theory of change processes is the idea of working backwards from a clearly defined long-term aim to then collectively identify key objectives or interim goals, and then an associated set of expected outcomes and outputs, then finally working out which activities and inputs will be required to achieve the goals. So while the defined aim for the 2012–15 programme remained the same – to increase the effectiveness and use of public dialogue in Government – an overall long-term goal was newly identified through the theory of change process, namely that '[a]ll decision making involving science and technology takes public voices into account, at the right time and in the right way, and is better, more effective and fairer as a result' (internal Sciencewise document). The move away from 'public dialogue' towards 'public voices' as a central aim and justification for Sciencewise was much discussed, with most Sciencewise actors feeling that it represented a positive and exciting step with the potential to broaden and enrich the programme's remit and activities. The three interim goals identified through the process were also different from the goals assumed in previous Sciencewise evaluations, placing more emphasis on achieving cultural and structural

change within Government, and on the creation of evidence to demonstrate the effectiveness of public dialogue processes.

Discussions around the identification of desirable medium-term impacts of Sciencewise work made explicit several goals and assumptions that had until then been tacitly held by particular individuals or groups. For example, the idea of having public dialogue or engagement included in official guidance and training for civil servants was collectively agreed on, and a formalised set of activities identified that could lead to this. Similarly, the need to increase the quality and pool of available contractors was discussed, leading to agreement that more effort needed to be put into sharing key knowledge and practices with contractors.

Public engagement space

During 2013, Sciencewise supported the Bioenergy Distributed Dialogue (BDD), run in partnership with the Biotechnology and Biological Sciences Research Council (BBSRC). In contrast to the public dialogue projects that Sciencewise had tended to support during this period of the programme's existence, this was an explicitly experimental project interested in creating a dialogue that could run over a longer period of time than other public dialogue projects, allowing for constant interaction and iteration between BBSRC research on bioenergy and the content of the dialogue itself. Sciencewise's model of public dialogue projects at this time recommended that they should be facilitated by professional facilitators, involve the participation of citizens and experts, take place over one or two days, and be tied in to a live decision-making process. In contrast, the BDD was designed as a package that did not have to be carried out by formal dialogue contractors but could be taken up by bioenergy researchers, independent facilitators, social scientists and civil society groups, with mechanisms to feed back their findings to the BBSRC. The dialogue did not require experts to be present during the public engagement process, and was designed to be carried out over a half-day or evening session to make it easier to organise. Finally the BDD was not tied into a clear policy or organisational decision, but rather was designed to allow more ongoing feedback and response between the BBSRC and the public on the organisation's research funding priorities and governance.

The design of the project was based on an earlier 'Democs climate change' card game developed by the New Economics Foundation for an early Sciencewise project in 2005 (New Economics Foundation 2005). The BDD's extensive set of cards contained stories about different stakeholders, different kinds of information about the characteristics and effects of bioenergy and some of the different moral and political issues thrown up by biofuels. The game itself was

organised around four plausible scenarios of the future developed by the BBSRC, describing the effects of different kinds of actions or inaction around bioenergy, which were intended to provoke discussion and debate. Through the group discussions the participants created clusters of the issue and information cards that they thought were most relevant or interesting, and that were then recorded by the dialogue organiser. After this each participant also had a chance to record their own preferences and state which issues they felt were the most important on an individual feedback form.

This process challenged the materialities and temporalities of conventional Sciencewise-supported public dialogues by creating stimulus material that could be accessed by anyone and changed over time in response to the emergence of new research findings or developments in the bioenergy debate. The whole card deck, game instructions and feedback sheets were available to download for free from the BBSRC's website to make it as easy as possible for anyone to run the process. It was anticipated that BBSRC-funded researchers would take up the opportunity to run these workshops, potentially transforming their own understandings of public perspectives on the issue of bioenergy. It was also hoped that community, activist and school groups would take up the process, alongside several formal workshops run by professional facilitators that were supported by Sciencewise and the BBSRC.

In practice there were fewer bioenergy dialogues carried out than had been anticipated by the BBSRC engagement team, with most BBSRC-funded researchers generally unwilling to engage with citizens in this way and with professional dialogue facilitators running dialogues only when specifically invited to and paid by the BBSRC or BBSRC researchers. However, some of the BBSRC public engagement team carried out a number of the dialogues themselves with one dialogue conducted by a University of the Third Age group. The materials remain available for groups to use and there is still a facility to feed back findings to the BBSRC.

The main criticisms of the BDD, some from Sciencewise actors, assessed it purely as a dialogue project. For example, pointing out that the citizen meetings were not long enough to provide the depth of deliberation necessary in a public dialogue, or that sessions overseen by non-specialist facilitators might produce abnormal results. However, since the production of an initial report and evaluation from the first phase of the BDD, the project has been used several times by Sciencewise as an exemplar of public dialogue and engagement and a possible indication of how dialogue methods could develop in future, in order to 'scale-up' or achieve deeper institutional change through dialogue projects.

Co-produced spaces of learning

These descriptions have situated learning processes within the specificities of particular organisational spaces, characterised by particular atmospheres, ways of doing, working assumptions and more. In parts, the narratives also hint at how learning processes have begun to alter and transform their organisational spaces or even create new spaces. The learning processes described have variously been articulated as reformulations of organisational goals and objectives, the creation of new rules and principles, incremental changes in routines and procedures, the development of new working relationships, the adoption of new discourses, changing dispositions and acknowledgements of failure. This section compares the characteristics of different organisational spaces and their consequences for learning, highlighting several key dimensions that emerge from the literature discussed above and the analysis, namely: the extent to which a space is routinised; the response to perceived failures; connections to and responsiveness to other organisational spaces; modes of accessing organisational memory; and dominant imaginaries organising and motivating action.

The centralised and routinised nature of the management space meant that mainly superficial knowledge creation and management occurred, with few opportunities for broader reflection on assumptions and modes of categorising organisational knowledge. Information was passed between formalised groupings in a routinised and standardised manner, while problems such as failed projects were either repressed or made legible and understandable through existing evaluation and review mechanisms. This rigidity also fed into a lack of responsiveness to other organisational spaces, for example not responding to changes in Government departments' strategic visions, insights from thought leadership work, or new models developed as part of individual dialogue projects. Institutionally inscribed power relations were also central in defining which organisational knowledge could travel and how, both in terms of knowledge-sharing with apparently distant groups like contractors, but also the kinds of information made openly available through the Sciencewise website. In the management space there was a large variety of ways of storing and accessing organisational memory, from increasingly organised routines and procedures for core activities, to documents and individual memories, which were all constantly being drawn on and transformed within meetings and everyday activities, to incorporate new experiences and perspectives or in response to external processes.

In the management space communications technologies usually associated with time-space compression (cf. Cresswell 2010; Massey 1994) did not seem to

enhance the mobility of actors, objects or ideas. This was due in part to issues of technical compatibility, but the technologies were more seriously undermined by the social relations and practices associated with this space. There were different expectations of the purposes of technologies, such as the contact management system or shared file systems among the different groups of actors in the space, and therefore different attitudes to engaging with and maintaining them. Furthermore, informal interactions at the margins of this management space, such as discussions in the lift on the way to meetings or at lunch breaks, were consistently rich sources of shifting understandings and practices, though they were not well-captured or encouraged by remote communications technologies like Skype or webinar software.

Actors and activities in the management space were mainly connected to other formal Sciencewise spaces, though there were also significant instances of cross influence with spaces of debate and demonstration around new policy practices, including open policy and evidence-based policy. This responsiveness was driven in part due to the interests and connections of some of the individuals involved in the space of management, as well as the conscious decision to invite external speakers to steering group meetings, including NGO representatives, members of the Cabinet Office's open policy team and the DEFRA Chief Scientist Ian Boyd. The increasing concern with advocacy within the management space and worries about the future of the Sciencewise programme also further motivated this connection to Government debates and agendas. The connections to the spaces of policy debates is evident in some of the decisions taken in the management space, including the topics of many thought leadership pieces and some of the public dialogue projects, and the running of several events on topics like open policy. Despite this cross-influence between spaces, the dominant imaginary in the Sciencewise management space remained the desire for the more widespread inclusion of the public in decision-making, with new concepts such as open policy or digital engagement being interpreted through this imaginary rather than changing it.

However, events in the fleeting and experimental theory of change process opened up a temporary, less rigid subspace within or connected to the management space that enabled some franker and deeper discussion, leading to potentially significant changes in aims and emphasis, and offered a potential challenge to embedded power relations. This was a temporary space resulting directly from reflection and contestation in the Sciencewise management space. It was a highly responsive and strongly connected space, providing a bridge between Sciencewise's every day and management space, and spaces of discussion and contestation around policy-making in Government. Its novelty and

temporariness contributed towards greater experimentation and reflection within the space, allowing for adaptation of practices through trial and error. Through accumulating insights during several rounds of discussion and refinement, and then a final whole team meeting to decide priorities, the learning processes in the space drew repeatedly on individual memories that were malleable and adaptive to context, but also needed to be viewed as credible and relevant to other actors in order to be included in the theory of change that was identified. Thus the process aimed to collect a diversity of perspectives that it then hoped to bring together to produce a degree of consensus on intended outcomes, which it seemed to have achieved in the December team meeting. The dominant imaginary that was expressed and increasingly emerged in this space was one of Sciencewise gaining increasing influence in Government, also prompting shifts in other prominent Sciencewise imaginaries, such as the move from promoting public dialogue to promoting public voices, in part due to the incorporation of broader Government imaginaries in the process.

The BDD was a temporary and novel organisational space – though it was also part of the broader organisational routine of overseeing public dialogues – which had an experimental and reflective character. The space was designed to be highly adaptive, both to the results of the citizen deliberations and advances in bioenergy research, creating the (yet unrealised) potential for the dialogue to be longer running and more influential than most Sciencewise public dialogues. The unanticipated low take-up of the dialogue kit among BBSRC researchers in more conventional scientific research spaces was more difficult to adapt to, but the BBSRC public engagement team managed to mitigate this to an extent by running several processes themselves and encouraging other practitioners who they knew to carry out the process in other locations. It was also hoped that the dialogue would influence BBSRC institutional structures in a broader way by demonstrating the potential value of deliberative public engagement to senior management actors, and several of my interview respondents indicated that they felt the process had received a positive reception in these quarters. The reliance on the card deck and feedback forms as the main modes of accessing memory and communicating findings potentially limited the richness and translatability of outputs from the processes.

Connected learning

This analysis shows a rich and complex relationship between learning processes and the characteristics of organisational spaces at the science–policy interface. Broadly speaking, novel, temporary and less routinised organisational spaces tended to coincide with more transformative and reflective learning processes,

allowing for the trial of new practices, for example in the BDD, or reflective discussions around organisational aims, definitions and categories, as in the theory of change process. More routinised, permanent and formal organisational spaces, like the Sciencewise management spaces and other procedures such as most of the public dialogue projects, were associated with more superficial learning processes concerned with the production and management of new knowledge through existing organisational understandings and categories. Permanent and highly routinised organisational spaces were sometimes co-produced with more transformative learning processes, for example when stimulated through connections to external spaces and actors, as is the case with transforming perspectives towards the Government's open policy agenda in the Sciencewise management space (Pallett 2015), or when new ideas successfully travelled and were embedded in these spaces from other more experimental organisational spaces like the theory of change.

Organisational spaces where there were more means of accessing organisational memories, or more malleable and therefore contextually shifting ways of accessing and interpreting these memories, also tended to be associated with more reflective and transformative learning processes. For example, the theory of change process drew on existing organisational documentation, and the memories of individuals which were elicited through formally facilitated processes, and reconsulted several times over a period of several months in order to check the credibility and clarify the meanings of collected ideas and memories. Furthermore, the importance of collective discussion and deliberation in this process helped to encourage the accessing of further relevant memories, as well as the constant reinterpretation of this memory in light of contextual factors identified and the reformulation of present aims and objectives.

Organisational spaces where activities were adaptive and attempted to create new practices and procedures, such as the BDD, were often associated with richer learning and reflection through their attention to context and close monitoring of the effectiveness of the new models. Spaces that featured more rigidly imported existing models and practices were limited in the communication of new knowledge and ideas, as well as opportunities for broader reflection, because the models functioned differently in these new contexts and were sometimes less able to generate meaningful outputs. However, the theory of change space also drew extensively on existing models and practices but was still able to foster new ideas and reflection, perhaps due to effort put into adapting the models for their specific contexts, and clearer visions among those orchestrating it of what they hoped to achieve.

These findings offer a useful counterpoint to McFarlane's (2011a) argument for the need to foster more spaces like hybrid forums in urban learning assemblages to enhance the possibility of transformative learning and progressive imaginaries. In the case of Sciencewise, a hybrid forum-like practice of running 'public dialogues' had long been established, but the highly instrumentalised and routinised ways in which these public dialogue projects tended to be carried out and fed into the management space of the organisation precluded many opportunities for learning (cf. Pallett and Chilvers 2013). Surprisingly, it was the theory of change process during the time of research that created the greatest opportunities for transformation during the period of research, though it was ostensibly a very closed process based on a heavily criticised methodology. However, the connectedness of this Sciencewise subspace to other organisations and other parts of the organisational network seems to have been an important factor in its ability to foster changes in understandings and practices. Furthermore, the BDD space also created the potential to encourage change due to its experimental nature and explicit aims to shift organisational narratives and understandings in the BBSRC and in Government, despite its apparent failings as a public dialogue exercise. This suggests that it is not the existence of hybrid forums themselves or the methodologies adopted that create the conditions for transformative and progressive learning, but rather that it is important to pay attention to their organisational contexts and the quality of their connections to other organisational spaces to understand how to foster learning.

Beyond the level of individual organisational spaces there were a number of influential narratives that travelled through and were co-produced with Sciencewise structures and practices during the period of research (cf. Linde 2009). The narrative of Government reform, and in particular changes in policy-making practice, was influential for example in spurring engagement with open policy and the digital agenda. A narrative that emerged within Sciencewise during the period of research, specifically through the theory of change process, was the narrative of Sciencewise enabling Government actors to engage with public voices. This narrative enabled Sciencewise actors to think more expansively about their role in science policy and democratic processes, and to have collective conversations about what the programme's future aims and activities should be (cf. Gabriel and Connell 2010).

Conclusion: towards a relational spatial account of organisational learning

This paper has developed and demonstrated a relational co-productionist conceptual framework for

organisational learning at the science–policy interface that brings the multiple spaces of organisations to the centre of the analysis. The in-depth empirical exploration of different kinds of organisational spaces and their links to learning here builds on earlier studies that have focused on particular kinds of organisational spaces (e.g. Pelling *et al.* 2008) and explored the micro-geographies of welfare institutions (e.g. Philo and Parr 2000). This has allowed for a discussion of a broader set of characteristics of these spaces and their potential influences on learning, as well as adding a comparative dimension to the analysis, which contributes new insights on organisational learning processes. For example, my analysis not only confirmed the potential for more informal organisational spaces to promote more reflective forms of organisational learning, but also showed a similar role is sometimes played by novel or temporary organisational spaces. Furthermore, the analysis strongly points towards the importance of connections between different kinds of organisational spaces, in order to encourage the translation of new practices, ideas and categories into everyday activities. It was often through the connections between more temporary, novel or experimental spaces, and more formal, routinised spaces, that opportunities for transformative change at the level of organisational aims and justificatory narratives seemed to emerge; for example, the emergence of reframed organisational aims from the theory of change process, which was intimately linked with Sciencewise's formal management spaces. However, it does not appear that the BDD, another temporary and experimental organisation space, had quite the same level of impact on the Sciencewise programme, at least in part due to the manner in which it was connected to more formal organisational spaces.

This perspective also develops the notion of a learning assemblage, which McFarlane (2011a) applies to understanding processes of urban learning and change, by using it to explain organisational learning processes at the science–policy interface, capturing a diversity of spaces and practices as in McFarlane's account, as well as drawing attention to the multiple temporalities and scales of learning processes. These detailed ethnographic insights into processes of organisational learning build on earlier studies of organisations of participation that have relied more heavily on document analysis (e.g. Rothstein 2013) or on shorter periods of engagement with organisations (e.g. Bickerstaff *et al.* 2010; Pelling *et al.* 2008). This has enabled this paper to focus not only on changes in discourse, but also more tacit changes in organisational practices, assumptions and categories. The more extended period of research also enabled the detection of longer-term trends and transformations. While other accounts of organisational learning have

tended to focus either at the micro (e.g. Conradson 2003; Stark 2012), organisation (e.g. Bickerstaff *et al.* 2010) or national (or even international) scale (e.g. Miller 2004; Pelling *et al.* 2008), this paper has developed a multi-scalar picture of the organisational learning processes in and around Sciencewise, emphasising the interrelationships between processes at multiple scales (cf. Darling 2011; Owens 2010). Furthermore, this multi-scalar account is not just a feature of the organisation chosen for study, but rather is a broader function of the empirical and conceptual approach taken. This suggests that comparative work on science policy and participation organisations in different domains or national contexts, or on different kinds of organisations, using the same extended ethnographic approach, would yield further valuable insights about different learning processes in different organisational spaces.

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