

Population analysis of organizational innovation and learning

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ABSTRACT

This article argues for a population level of analysis, addressing a theoretical and empirical gap and enabling the analysis of transition, tempo and timing at the macro level. The article examines four theories of population-level innovation: population ecology; neo-institutional theory; innovation diffusion; and population-level learning theory. A population-level empirical study of innovation and organizational learning addresses three research questions: the first and second examine patterns of innovation underpinned by learning over space and over time. The third concerns the processes and dynamics of those patterns. The data derive from local government, using mixed methods and multiple respondents over nine years. The research shows the uneven spread of learning across the population, with two sub-populations emerging. Over time, innovation and learning strategies shifted. Learning in the population occurred through both direct interaction and vicarious learning from others in the population. Implications for population-level theory, innovation and learning are explored.

Keywords:

Innovation, learning, population, local government, Beacon Scheme

INTRODUCTION

Theories using a population level of analysis are deployed in a wide variety of biological and social science disciplines, including organization studies, demography, sociology, ecology, epidemiology and microbiology. This level of analysis enables observation and analysis of patterns and dynamics of transition, tempo and timing at the macro level not observable at the micro level. Baum and Shipilov (2006) note that in population-level organizational analysis “diversity is a property of aggregates of organizations that has no analogue at the level of the individual organization” (p. 55).

Population here is deployed with a clear and specific definition. In organization studies, it is defined as “a set of organizations engaged in similar activities and with similar patterns of resource utilisation” (Baum and Shipilov, 2006, p. 55). This builds on the seminal work of Hannan and Freeman (1977) who noted that populations are organizations which share a “common fate with respect to environmental variations” or put another way “classes of organization that are relatively homogeneous in terms of environmental vulnerability” (Hannan and Freeman, 1977, 934). Scott (2013) uses this definition in his overview of institutional theory. Hannan et al (2007) later described a population as “bounded sets of entities with a common form, often interacting with each other and struggling over common resources” (p. 86). To be clear through contrast, population is not here the statistical concept of the entity from which a sample is drawn, nor is it members of a species in a defined geographical area or time.

Population analysis of organizations is valuable for several reasons. First, in theoretical terms, it can provide insights about change and transmission processes which are not observable at more micro levels, showing patterns across organizations over space and over time. Second, there may be variation within a population not evident at the organizational level (Baum and Shipilov, 2006). Third, population studies avoid the biases introduced by a focus on successful organizations (Overman and Boyd 1994; Denrell, 2003) because the full range of organizational performance is analysed.

The value of a population-level of analysis in understanding innovation is that it examines learning head-on, and importantly enables the development and use of theory to explain the dynamics by which learning occurs across a population, going beyond the organizational level. There can be additional dynamics across a population due to vicarious learning which occurs through observation of, and reflection on, other organizations (Baum and Berta 1999; Miner and Robinson, 1994). Indeed, analysis shows that learning from failure can be

beneficial at population level, even when harmful to the individual organization (Miner et al., 1999).

A population-level approach also enhances the analysis of changes over time. There are surprisingly few studies of innovation or of organizational learning over time (Kim, 1998) or of institutional processes with timing and temporality more generally (Thelen, 2000), despite learning being a dynamic process with inevitably chronological aspects. Instead, research has often relied on retrospective accounts of organizational processes, with inevitable problems of recall and under-sampling of failures. Finally, the population level helps to enhance awareness of the effects of ecological and historical interactions, and the macro context (Levitt and March, 1988; Argote, 2012).

Studies of population-level innovation and learning have concentrated on the private sector (e.g. Hannan et al., 2007) but this current article extends analysis to public organizations. It draws on four theories about innovation and learning at the population level and applies these to public services for the first time.

The focus on population-level analysis enables three research questions to be explored here. First, what are the patterns of innovation and learning which occur over space in a population. Second, what are the patterns of change over time across the population. Third, what are the dynamics of innovation and learning which explain those patterns over space and time.

The empirical examination is in English local government. Local authorities are a population sharing a legal and regulatory context, many service functions, and are under similar environmental pressures. The Beacon Scheme, which was a public service reform initiative over a decade involving all English local authorities (then 388 organizations), can be

conceptualised as providing opportunities for learning and innovation within and across the whole population. Data collection and analysis extended over nine years.

We contribute to the literature on organizational and inter-organizational learning in three significant ways. First, by reviewing and comparing four key theories relevant to population-level analysis of innovation and organizational learning, this article brings population analysis to public administration, assessing the value of each framework to the public sector. The article uses the four theoretical frameworks to extend theory to public service organizations, drawing particularly on learning capacity, sub-populations and vicarious learning as shaping change. Such theories tend to be largely absent in the field of public administration, but this article argues that theory at this level of analysis is highly relevant and informative.

Second, the article addresses how learning takes place at the macro or whole population level. This analysis reveals dynamics not observable at other levels and enables theory development over space and time. Analysis uncovers uneven development across the population, with both spread and non-spread of innovation, sub-population differences and differences in learning capacity. Such population-level analysis takes research beyond the organizational unit, the network or learning by the most successful organizations.

Third, this population-level approach enhances the study of organizational learning over time. Longitudinal, real-time research can provide rich analyses of unfolding processes of change. The article is based on data collected over nine years, so this is not a snap-shot in time but rather an unfolding of innovation and learning, tracking the tempo and timing of key organizational changes. This reveals an uneven pattern of change over time, with those organizations with greater learning capacity pulling ahead from those with less learning capacity, though over time the whole population shifts in its approach to learning from others.

The article is structured as follows. First, innovation and learning are briefly defined and scoped. Then four main theories about population-level analysis and their contribution to innovation and learning are examined and evaluated. The research design and methods are described before the article turns to examine empirical evidence about innovation and learning to answer the research questions through analysis of the Beacon Scheme in local government. The value of this approach to population analysis is discussed, interpreted and evaluated. The research illustrates the opportunities to use population as a level of analysis in public service organizations based on understanding innovation and learning across space and time.

THEORY

This section starts by briefly scoping and defining key constructs for this article: innovation and learning, before turning to examine four theories relevant to population-level analysis.

Population-level analysis is applied here to innovation and its underpinning processes of organizational and inter-organizational learning¹. The concept of innovation has become more prominent in public administration theory and research (Osborne and Brown, 2011; de Vries et al., 2016; Clausen et al, 2019), particularly in relation to public service reform, where innovation has been championed as a key means by which improvements in public service efficiency, effectiveness and legitimacy are sought. Innovation is defined here as the implementation not just the invention of new ideas and practices, which are new to that organization though can have been developed by others (Demircioglu and Audretsch, 2017).

¹ In this paper we use the term organizational learning to cover both intra- and inter-organizational learning for ease of reading the text.

Organizational learning is conceptualised as socially constructed and contextually embedded collective practice which enables change in an entity's range of potential behaviours, through its processing of information (Huber, 1991). Organizational learning occurs where learning co-exists at several levels, and where organizational practices and structures produce, share, interpret, and embed learning (Easterby-Smith and Lyles, 2005; Argote and Miron-Spektor, 2011; Chiva et al., 2014). Sharing learning across organizational boundaries constitutes inter-organizational learning (Holmqvist, 2004).

Learning is central to innovation, because acquiring and using new knowledge enables the implementation of new ideas and practices (Argote and Miron-Spektor, 2011; Bapuji and Crossan, 2004). Organizational learning theory has made great strides in understanding how organizations learn but has not sufficiently expanded its focus across space and time.

Researchers have called for theorising and empirical studies on whole populations of organizations (Crossan et al., 2011; Miner and Mezias, 1996) and longitudinally over time (Easterby-Smith and Lyles, 2005). However, few studies have examined organizational learning at the population level (Miner and Haunschild 1995; Haunschild and Chandler, 2008). This deficit was noted in a key review: "*expanding a theory of OLto the population is a valuable extension*" (Crossan et al 2011., p. 453).

A review of four theories relevant to population-level analysis

The article now reviews and comparatively evaluates four theories relevant to population-level analysis: population ecology; neo-institutional theory; innovation diffusion theory and population-level learning theory. These theories were selected as relevant to spatio-temporal analysis of change across organizations.

Population ecology The theory of population ecology (Hannan and Freeman, 1977) examines competition between private sector organizations, aiming to explain the dynamics of diversity and organizational death rates within industrial sectors. Competition is seen as a key process for modification of organizational characteristics within a population. This theory stimulated many empirical studies across a wide range of private manufacturing and service sectors (Hannan et al, 2007) but none in public service sectors - perhaps not surprising given the focus on market competition and organizational death rates. Population analysis provides insights beyond those at organizational level because patterns over time and space can be analysed along with the associated dynamic processes of adaptation and selection. The authors noted but did not comment on the role of learning in adaptation to a changing environment, with a single reference to “learning or adaptation in human systems” (Hannan and Freeman, 1977). Later, they proposed to “defer to future research” analysis of learning processes in the theory (Hannan et al, 2007, p.233). Thus, the role of learning in population ecology is accepted but unexplored. This framework is relevant to public service innovation and learning because it deploys the concept of a population based on sharing an environment which stimulates adaptation. However, the dominant mechanism of market competition in the theory is less relevant to public service organizations (though some operate in quasi-markets) and the interest in organizational death as a result of mal-adaptation to the environment is only infrequently relevant to public services, so the theory has some but weak relevance to public service organizations.

Institutional theory – Population-level analysis occurs in institutional theory (Scott, 2013, Lammers and Garcia, 2014). Neo-institutional theory has become diverse, even diffuse (Alvesson and Spicer, 2019) but adds insights into the spread of innovation through not only rational action but also through symbols, meanings and legitimacy (Lawrence and Suddaby, 2006). It allows for cooperative as well as competitive processes in populations. Early

theory focused on pressures for stasis in institutions, and isomorphic (conformity) pressures (e.g. Di Maggio and Powell, 2002). However, later neo-institutional theory emphasises the institutional work undertaken by actors to create, adapt and change institutions (e.g. Lawrence and Suddaby, 2014; van Gestel et al., 2018) with different trajectories of institutional change over time and space (Micelotta et al, 2017). A few studies explored vicarious learning effects in a population (Scott, 2013; Posen and Chen, 2013; Srinivasen et al., 2007). Thus, institutional theory adds depth to population studies, helping to explain socio-cultural processes which create inertia or change and allowing for both isomorphism and variation but with relatively little attention to processes of learning underpinning innovation.

Innovation diffusion theory - The diffusion of innovation literature, kickstarted by Rogers (2003), analyses how innovations are spread, based on characteristics of the innovation, the social system and the communications. The social system is more akin to organizational field than population (e.g. Rogers, 2003; Shipan and Volden, 2012). In an extensive review of innovation and diffusion models, Berry and Berry (2017) note five mechanisms which contribute to explaining policy diffusion: learning, imitation, normative pressure, competition, and coercion. However, they note that *“for each diffusion mechanism.....the goal [of research] should be to construct indicators for the presence of the mechanism”* (Berry and Berry, 2017, p. 282). This indicates a gap concerning learning processes. Diffusion theory has been applied to public services innovation (e.g. Williams, 2011; Greenhalgh et al, 2004) but is sketchy about learning processes. Greenhalgh et al (2004) also critiqued diffusion theory for being more applicable to simple than complex innovations.

Population-level learning - Researchers define population-level learning as *“systematic change in the nature and mix of routines, strategies or practices in a population of organizations”* (Miner et al 1999, 188; Miner and Haunschild, 1995). Population-level

learning has “*unique advantages over an organization’s own experience*” since it offers individual organizations the opportunity to exploit the successful exploration of others in the population, by grafting or importing external knowledge (Baum and Berta, 1999, 161). Variation across a population of organizations includes at least two sub-categories: higher status, more successful innovators; and lower status adopters and adaptors (Baum and Ingram, 1998). The interest in variation and in the identification of sub-populations means that population-level learning theory can consider both convergence (through mimetic and coercive copying) and also divergence (through innovation and avoidance of failed practices). Population-level learning can take various forms: first, learning can be generated by individual organizations and spread through interaction across that population of organizations; second, a population as a whole can learn from its existing knowledge to generate new knowledge at the population level; third, knowledge can be acquired and mobilised from one population to another population (Miner and Haunschild, 1995; Baum and Ingram, 1998). Potential sources of population-level change include collective experimentation; selective imitation (Miner et al., 1999); deliberate adaptation to cultural change; responses to institutional forces (Haunschild and Chandler, 2008); learning from the failure of others in the population (Miner et al., 1999; Kim and Miner, 2007); and exogenous shocks and shifts in the shared environment (Haunschild and Chandler, 2008). A key aspect of learning across a population, then, is that it may occur not only through an organization’s own experience but also through observation and reflection on the experiences of others in the population (Baum and Ingram, 1998).

To some extent, population-level learning can be seen as a sub-type of neo-institutional theory, since it has a focus on social, cultural and political factors as well as on rational processes and Haunschild and Chandler (2008) themselves see their contribution in that light. However, they also argued that neo-institutional theory was too focused on normative

pressures, with insufficient account of variation. They suggested that population-level learning shows variation as well as conformity precisely because learning is involved. However, the theory has focused on private sector populations (e.g. hotels, automobiles, music, banking).

Summarising the literature on population studies and learning, there are some key themes, which are shown in Table 1. It is clear that there are overlaps between the four theoretical approaches, each with different emphases and different theoretical predictions. This article primarily deploys the population-level learning framework, applying it for the first time to public services. This framework speaks most closely to learning and also it addresses some of the dynamics which may underpin population changes, allowing for variation among population members. The other three frameworks offer additional insights which will be explored.

Table 1 about here

This review of pertinent literature at the population-level of analysis enables the articulation of three key research questions. First, what is the macro or population-level pattern of innovation and learning over space (i.e. across the whole population)? Second what is the population level pattern over time? Third, what is the most appropriate theoretical explanation of these dynamic macro patterns. We will examine the first two questions together, in that analysis of spatial changes are inevitably about patterns over time as well. The empirical context is the population of 388 English local authorities.

METHODS

Research Design

The research questions are explored in empirical research analysing innovation and learning through the local government Beacon Scheme. Studying population dynamics in local government is valuable because it is a large sector (Krebs and Pelissero, 2010), and a key part of public services in many countries.

The Beacon Scheme aimed to stimulate learning, innovation and performance improvement among the whole population of 388 local authorities in England between 1999 and 2008².

The Beacon Scheme was voluntary and had two aims: to provide national recognition of high performing or innovative local authorities through a prestigious competitive award; and for the award holders to commit to sharing their ‘best’ practice among other local authorities. Each year, around ten public service themes were identified for the competitive award.

Those awarded Beacon status then organised a variety of events to disseminate and share their innovative practices. Non-Beacon local authorities were encouraged to voluntarily participate to learn about innovations through such events. Thus, in any year, there were two distinct groups within local government - award holders (Beacons) and those without the award (non-Beacons).

The researchers identified four types of Beacon learning event: national and regional conferences with all Beacons in a particular theme; open days held by individual Beacons, which enabled interaction with the service, its providers and users; information on each Beacon’s website; and tailored events such as work shadowing. Learning was found to be linked to innovation (Hartley and Rashman, 2018; Hartley, 2008). This article concentrates on the patterns and dynamics of organizational learning as an element of innovation.

² The Beacon Scheme applied to England (the largest of the UK’s four nations). It also covered a small minority of other local public services but analysis shows that local government was the overwhelming majority of organizations and viewed themselves as a complete sector (Hartley and Downe, 2007).

The construct of learning is operationalised as the nature, rate and mix of knowledge-creation activities. Organizational learning capacity is defined as the active mastery of the dynamics of learning, deploying deliberate organizational goals and strategies to increase the knowledge base, expand social structures to embed knowledge across the organization, increase the rate and spread of knowledge accumulation so as to generate shifts in subsequent cycles of learning. It has two sub-elements concerned with acquiring knowledge from outside the organization and deploying and sustaining knowledge inside the organization. Organizational learning capacity is here operationalised quantitatively through an eight-item self-report measure, following a literature review and pilot work (Rashman et al., 2009; Rashman, 2009). The concept is also explored qualitatively in case studies.

Research methods

The research used a mixed methods research design, utilizing the strengths of both qualitative and quantitative data (Creswell and Clark, 2006). The study has longitudinal real-time data gathered over nine years between 2000 and 2009 about English local governments, using both qualitative and quantitative data. In addition, the methods used multiple respondents in different organizational roles, which is a robust research design (Walker and Enticott, 2004).

The qualitative research had several components. Thirty-six case studies of local authorities were undertaken, selected to reflect: variety in level of engagement (including non-engagement) in the Scheme; variety in performance as public service organizations (judged by external formal assessment); and local government types³. Each case involved a site visit and four to six semi-structured face-to-face interviews with different organizational respondents (politicians, strategic and operational managers, external agency partners and

³ Local governments vary by size and functions and fall into four types: district, county, metropolitan and London councils.

service delivery staff) and analysis of documents. Twelve case studies were repeated two years later. The interviews, each lasting around one hour, focused on the acquisition, use and possible adaptation of knowledge and practices from Beacons, along with views about the Beacon Scheme as a whole and whether and how the respondents saw learning, innovation and improvement taking place across the whole population of local governments. Interviews were audio-recorded and along with field notes were transcribed, coded, and analysed using thematic analysis (Radnor, 2001) using within-case, cross-case and longitudinal analysis.

In addition, there were 59 respondents in focus groups and individual telephone interviews with senior representatives of 39 local governments in 2000 (across all variations as above); and 27 telephone interviews with officials in central, regional and local government, national agencies, non-government organisations and professional bodies. Thus, there are views both within and outside the population being studied. The researchers also participated in regular discussions about the Beacon Scheme with national policymakers and examined academic and policy documentation about the Scheme over a decade.

Quantitative data were collected from a range of sources. Data on Beacon award engagement (no application, applications, shortlisting and winners by year) was analysed for all local authorities. Three time series surveys were conducted in the early (2001), middle (2004) and late (2006) phase of the Scheme about local authorities' degree of engagement in the Scheme, perceptions of the Scheme, and the self-reported extent, mechanisms and impacts of learning from the Scheme. The survey used multiple respondents from six different roles within each organization to ensure coverage of both political and managerial leadership and management, and at both strategic and operational levels. There were 314, 448 and 360 responses respectively, representing 47%, 49% and 45% response rates. Each survey was representative, based on two comparisons. First, the samples were typical by local authority

type. Second, the samples were typical in terms of Beacon award applications (percentages of awarded, short-listed, applied, did not apply that year).

It should be noted that the data presented here are becoming historical more than contemporary, as happens regularly in population studies (Baum and Shilipov, 2006), because of the need to collect and analyse data over long time frames.

FINDINGS

The findings aim to examine the three research questions in turn: the spread of learning over space, the spread of learning over time and then the dynamics of population-level innovation and learning. Due to the range and complexity of the research design, we cite other publications where data is provided in greater detail. We draw on data illustratively rather than comprehensively to examine and evaluate for the first time the population level of analysis in innovation and learning in public organizations.

The spread of learning over space (across the population) In year one of the Scheme, interviews showed considerable diversity of perceptions of, attitudes towards and behaviour concerning the Beacon Scheme. Most local government politicians, managers and staff said they valued the opportunity to share good practice with peers in the sector and welcomed the recognition for local government through an award scheme. (Rashman and Hartley, 2002; Rashman et al., 2005). A small number of local authorities had mixed views about the programme, disagreeing with the policy and/or believing that the cost-benefit ratio in relation to learning outcomes was not worth it They did not participate and did not engage in inter-organizational learning (Rashman and Hartley, 2002). However, in the first survey 53% of respondents had attended at least one Beacon learning event, reflecting its novelty.

Interest in the programme spread across the population of local governments, with more organizations involved both as award applicants and as learners year on year, (with a slight dip in year 2 when the value of the programme was still uncertain to many) (Hartley and Downe, 2007). By the end of the Scheme, all bar one local government had participated as either a Beacon or a learner (Hartley and Rashman, 2018). Table 2 uses survey data to show that the number of visitors increased in all Beacon learning-event categories (statistically significant at $p < .001$ level, χ^2 test).

Table 2 about here

The spread of learning over space in sub-populations While there was spread of learning across the population overall, as noted above, this was not isomorphic change but rather variation between sub-populations. In its aim, the Beacon Scheme was designed to share learning so that all would benefit from the practices of award holders and all would be raised to the standards of the best. However, this did not happen. Instead, an unintended consequence was the emergence and consolidation of two sub-populations with different learning characteristics and differential organizational capacity to share learning and create innovation. Central and local government officials noted that local governments were polarising with some active and developing fast while others were not engaged at all or much. In the 2004 and 2006 surveys, sub-population differences in organizational learning capacity between Beacons and non-Beacons were statistically significant. The two groups' approach to the acquisition and use of new knowledge, practices and structures is shown in Table 3. Beacons were more effective in both intra- and inter-organizational learning processes.

In 2006, with the same measure, a similar pattern of statistically significant differences between Beacons and non-Beacons were present, replicating two years later the unevenness in population-level learning. Both groups had improved their organizational learning capacity but in 2006, the non-Beacons continued to assess their capacity for learning as significantly less than Beacons. A more robust knowledge base, and greater exploration and exploitation aided the organizational capacity of Beacons themselves, compared with the weaker learning capacity of non-Beacons.

Table 3 about here

Furthermore, in the 2004 survey, 84% of Beacon applicants that year reported that the application process was itself useful in prompting learning, whether or not they were successful in their bid. Interviews showed that this required reflecting on the state of local government as a whole and the individual organization's location within the population. Thus vicarious learning was exhibited as well as the population generating and using knowledge about itself as a whole population. Across the nine years, sub-population differences continued and in fact increased over time. Greater not less variation over time became evident.

Learning over time across the population

Addressing the second research question, population-level learning changed over time. First, the amount of reported learning increased. Most local authorities reported that their organizational learning capacity increased. Participation rates in deliberate knowledge sharing increased significantly between 2004 and 2006, an increase in engagement in Beacon

learning activities from 30% to 58% by survey respondents. During the same period, survey respondents had increased their knowledge about learning new ways of doing things (2004 mean 3.26; SD .892; 2006 mean 3.57; SD .807; t value -4.827, $p \leq .001$). For non-Beacons, the learning process was better understood over time. 82% of learner organizations in 2004, compared with 67% in 2001, reported that they prepared before a visit/event for participation in learning activities, indicating that more had developed a learning strategy (part of learning capacity).

The extent and type of the learning also changed over the nine years. Temporal analysis (Langley et al, 2013) indicated the conceptual division of innovation and learning into three phases, which were indicated by different approaches to innovation and learning. In the first phase, the Scheme focused on “best” practice and dissemination, with a strong emphasis on imitation of high performing local governments and with a uniform, broadcasting method. The learning events did not initially recognise or cater for the different types of learning sought by visitors. Few Beacons or visitors had a framework for how organizational learning might occur and few considered how learning could contribute to wider organizational goals. Also, the learning events were widely seen as a short-term resource to address improvement in particular services, rather than as a longer-term resource for the whole population.

In the second phase, there was more interest from local authorities about whether and how learning supported innovation and a dawning realisation that innovation often involved adaption to the local context and conditions, which required more sophisticated learning strategies and greater learning capacity. Beacons discovered that learning was enhanced where attention was paid to learning pull not just dissemination push and that different visitors had different goals in learning. For example, chief executives and elected politicians mainly wanted to learn about how organizational change had been mobilised, led and managed while operational managers responsible for services were more focused on solutions

to practical problems within particular services. Both Beacons and learners started to emphasise sharing tacit knowledge, to understanding the underlying processes of learning in and across organizations, and to use learning to mobilise and embed service and organizational change. The learning process was better understood, with more visitors using a learning strategy to prepare better. There were more events undertaken by Beacons tailored to particular learning needs or type of learner. The programme increasingly came to be seen as about building the learning and innovation capacity of local government as a whole.

In the third phase there was a growing recognition of the variation between local governments in their organizational capacity for learning, and therefore greater efforts to support building capacity in learner organizations, including through peer support and a greater emphasis on the more tailored approaches to learning (more interactive discussion between organizations, and more clusters of organizations working together to improve their learning capacity). Local authorities become more confident about two aspects of learning. First, that learning was about underlying plans and models and not just about activities, procedures and benchmarks (for example, how to mobilise change, or how to garner political support for improvement). Second, that learning was adapted not simply replicated in order to take account of the local circumstances (for example, the demographic, political and social context, as well as the financial and organizational context). Adaption more than adoption of practices became more salient over time. There was growing interest across the population in innovation (the promising practices element) rather than replication. Learning over time relied more and more upon the quality of the learning relationships within and across local authorities. Some non-Beacon local governments reported using knowledge acquired from Beacons very strategically to support organizational change, and not just to imitate “best practice”. Furthermore, local politicians became increasingly involved in learning events

and in helping to share learning. So the programme shifted to include a governance as well as a management focus.

Beacon learning events increasingly focused on the concept and practices of innovation, with an interest in new thinking and “promising practice”, not just “best” practice. 51% of respondents in the 2004 national survey felt they had learnt about innovative practices from Beacons. By 2006, 69% reported that the Beacon Scheme increased confidence in being innovative (69%) and that the Scheme encouraged the introduction of innovative ideas and practices (68%). These data (similar but not identical questions due to research constraints at the time), suggest a growing interest in innovation rather than replication. The case studies also reflected a stronger interest in locally-adapted innovation.

Overall, the data show meta-learning about the spread, pace and extent of learning. Change and innovation at the population level took place amongst local governments. They accumulated knowledge about why and how to engage in sharing good and innovative practices across the local government sector, and there was a shift to interest in enhancing learning capacity not just ‘fixing’ particular services.

The dynamics of innovation and learning

The article now turns to examine the dynamics which may contribute to explaining those patterns, with the four earlier theoretical frameworks about population dynamics in mind.

Learning from their own experiences One population pattern already noted is the increased organizational learning capacity, including with sub-population differences. Some local governments learnt how to improve their learning capacity. Survey participants reported strengths and gaps in their organizational learning capacity. Data are shown in Table 3. Local governments actively encouraged the search for new ideas to improve services; including

from external sources; but their prior knowledge base was relatively weaker initially with regard to organizational practices and structures to share, interpret and embed learning, including external networks and internal support to complex learning compared with later in the time period. These patterns suggest that the internal practices supporting learning were important as an element of organizational capacity. However, inter-organizational learning was also important so this is now examined further.

Learning from direct contact with others in the population The respondents of the first survey cited a variety of motivations to interact with Beacon local governments, to: find out about practice in other councils (92%); hear about innovation and new ideas (89%); learn how Beacons achieved change and improvement (88%); compare performance against Beacons (75%). Other motivations related to reputation management, to: show interest (26%); and signal willingness to modernise (22%). These motivations suggest an awareness of the standing of the local government organization within the overall population.

The longitudinal case studies and interviews with central government officials showed that Beacons enjoyed an elevated prestige which itself drove further learning among them. This elevated prestige and sense of responsibility in the sector, may contribute to explaining sub-population differences, in that Beacons were involved in greater interaction with other local governments across the whole population. They interacted with more local authorities.

Some learning took place directly between organizations – between Beacons and non-Beacons. In later phases, learning was often targeted to particular learning events in order to acquire knowledge from specific Beacon organizations, with the non-Beacons comparing themselves with organizations with similar geographical characteristics and/or political control and strategic priorities. For example, district local governments (the smallest type of UK local government) reported greater trust, collaboration and customization of knowledge when learning from members of their own “family group” (Downe et al., 2004). One case

study organization aiming to improve its school education service deliberately chose a Beacon in another part of the country which had similar geography and demographics.

A minority of organizations did pursue learning from dissimilarity: for example, a small local government concerned to improve its local planning regulatory service gained insights from a much larger local government in a different social and economic context, with better resources financially and different political control. The comparison of these macro-factors helped the learner organization to reflect on and analyse its own rationale and approach to change. Its own innovation drew on the larger local government but was adapted locally with support from politicians, the chief executive and service managers. This illustrates not just direct comparison but also involves inferential learning from difference, and shows the capacity to examine underlying processes of innovation.

Vicarious learning from others Some learning was vicarious rather than experiential. The programme enabled not just interaction with other organizations but also reflecting on and learning from what other local authorities were doing. Events were not only about immediate learning but about sharing information about and across the sector, which included talking about and evaluating what was working and what was not working across local government. They learnt from both success and failure over time.

Vicarious learning also happened through the informal judgements which local governments made about whether or not a particular local government “deserved” its Beacon award. This drew attention towards some high-status local governments, the basis on which Beacons had gained their award and why some had been passed over in the application process. In the early and middle periods, the Scheme was sometimes seen as controversial in its choice or elimination of particular local governments, which generated wider discussion about the criteria across the population. In addition, applicants for the award were particularly likely to undertake vicarious learning while they reviewed their own chances of winning as they

prepared their application. However, the wider vicarious learning was also exhibited as local governments rated and ranked themselves against others in the sector.

Learning from failure elsewhere was found to be beneficial to learners. In the case studies, managers said they gained as much from learning about failures and false starts by other local governments as they did from learning from so-called “best” practice. Sometimes, success even created scepticism and caution among learners, reducing the motivation to ‘take home’ and adapt the learning. Beacon local governments learned over time to explain and share their failures as well as their successes, finding that this created more motivated learners because the perceived gap between Beacon and learner was lessened and learners found this more encouraging. This is further vicarious learning.

DISCUSSION

There are distinctive insights which arise from considering learning at the population level of analysis, enabling spatio-temporal theorising which goes beyond innovation and learning at the organizational or inter-organizational level.

Patterns of innovation and learning over a population

Learning across the population was very uneven, with evidence of *variation and divergence*. Far from exhibiting institutional isomorphism (Di Maggio and Powell, 1983), organizations varied in participation, innovation and learning. Learning strategies and rates of learning varied across the population and also exhibited divergence between subpopulations. Beacon local governments, publicly marked out as having ‘best’ or promising practices worth emulating, reported learning more and at a faster rate than those which were supposed to be ‘catching up’. Those organizations with the structures and cultures to support and engage

with learning processes learnt more than those which did not have such organizational learning capacity.

The population level of analysis is insightful in suggesting there can be variations when common policies are applied. These findings reflect adaptation from population theory and are more supportive of a neo-institutional ‘translation’ process than isomorphism.

Population-level learning theory actually predicts the likelihood of variation as well as conformity. This empirical research finds the population-level learning approach pertinent here. Study of learning over time also suggests a shift, across the population, away from isomorphism to greater variation.

Turning to examine *how* learning was shared across the population, the research found two forms of learning processes. There was first, *mutual learning* between organizations, through direct experience of sharing learning about public services and about the mobilisation of organizational change. This has been documented in organizational learning studies (Argote, 2012; Chiva et al., 2014). Higher status organizations and those which were similar or proximate were those where interaction initially occurred, though wider interaction developed over time. However, learning also took place through learning from the *observation of others in the population*, through vicarious learning (Kim and Miner, 2007). Beacons, as high-status organizations, were signals that there were ideas and practices which might be emulated in other parts of the population. At first glance, this might be categorised as simply institutional isomorphism (Di Maggio and Powell, 1983) but the research evidence shows adaption much more than adoption (Rashman et al., 2005; Hartley and Benington, 2006; . Adaption requires processes of organizational learning (Crossan et al., 2004; Argote, 2012). This again reinforces dynamics of variety not solely conformity. Furthermore, organizational capacity was a factor in divergence, with some local governments having or acquiring and increasing their ability to ensure external learning was supported by internal

practices and processes to enhance innovation and learning. An organizational level of analysis is insufficient for public organizations because they adapt and change through influencing each other across the sector. Both population ecology and population-level learning are pertinent here.

This research shows that population-level learning can occur through collaboration as well as through competition, in contrast to population ecology theory, and thus is a contribution beyond all four frameworks. This changes and broadens the theorising about the influence of competition and/or collaboration in learning within a population. It can be relevant to some collaborating private sector organizations (e.g. in collective endeavours, in supply chains, Barbucha, 2014) and hybrid organizations as well as public organizations, though further research is needed on this.

Learning shifts over time

The evidence provides a contemporaneous, time-based view of learning *shifts* across the population over time, avoiding hindsight problems (Easterby-Smith and Lyles, 2005; Argote and Miron-Spektor, 2011). The analysis over time also shows that those local governments which were already more accomplished or more motivated to engage in learning (having greater organizational learning capacity) pulled ahead of the rest of the population. The analysis over time shows differential speeds and capacities for learning among the sub-populations. Variation increased rather than decreased over time. This is an important issue for national policy-makers who sometimes assume that ‘rollout’ will increase uniformity. There is a need for more research which maps variation over time and examines its underlying dynamics. Clausen et al (2020) note the importance of organizational capability in being able to create and use innovation in public sector organizations.

The population level of analysis also showed a shift from learning about ‘best practice’ (with its implications of uniformity, standards and one best way) and a focus on the high-status organization to a focus on learning about how to adapt and innovation, with the focus on the learner. This is a shift from imitative innovation to creative innovation. The population-level frameworks in part predict this (adaption in population ecology, institutional work in neo-institutional theory, and population-level learning. Diffusion of innovation theory is agnostic on this). However, there are very few empirical studies to show this, and even fewer in public services. Organizational learning capacity is proposed here as a key mechanism to enable this shift. Policy diffusion and policy enactment theories would benefit from more attention to learning.

This article draws on the concept of organizational learning capacity to explain how cycles of learning can lead to greater mastery of learning strategies, and the embedding of knowledge cumulatively. As some local governments became more skilled in adaption not just adoption, their sources of learning became more diverse, including learning from dissimilar organizations. This had been noted in private sector organizations and has been hinted at as a mechanism for population learning but this study provides data from the public sector.

However, there is a caveat. This population analysis is based on data collection which started in the year 2000 and spans nine years. While the data were collected in real time, which is a strength, the study is also now dated in its data, as can happen in population level studies, due to the complexity of the data and the need for data sets over time (Baum and Shipilov, 2006). Some caution is needed in applying ideas to contemporary populations and to public sector reform, where the actual patterns may be somewhat different though we would wish to argue that the dynamics of innovation and learning may still be highly relevant.

This study has focused on learning in populations, but also illustrates that the population level of analysis enables a ‘helicopter’ view of the patterns and dynamics of innovation and

learning over space and over time. Policy adoption, organizational change, organizational learning and a number of other organizational processes might be researched using this approach. It is particularly valuable for public organizations, where service sectors share environmental vulnerability (Hannan and Freeman, 1977) through their legal, regulatory and policy context. Population sensitises researchers to look for influences beyond the organizational and organizational cluster level. It avoids the bias of focusing on success stories in innovation.

Population studies are not easy. They require scope and scale of research to undertake and the policy context may itself be fluid making consistency of research design difficult. Nevertheless, studies which are alert to influences beyond direct contact between organizations, and which are sensitive to which organizations are used as peers and as population, will help develop this field.

CONCLUSIONS

This study used a population level of analysis of English local government over nine years, to explore how innovation and learning can be discerned as macro patterns, and then to examine the dynamics which underlie those patterns. The study shows that the macro perspective of population analysis reveals patterns and dynamics which are not so accessible at the organizational or inter-organizational level. Sharing learning was not uniform and while spread of participation in the Beacon programme occurred, learning was uneven. Far from showing 'institutional isomorphism' the population showed variety across the population and this variety increased over time. The population-level analysis identified sub-populations which can take different trajectories over time. This suggests that organizations will vary in their response to policy initiatives, a point of considerable interest to both policy-makers and

practitioners. Innovation and learning took place not just through experiential interaction, but through vicarious learning (learning from observation) and through learning from the failures of others, findings which should influence the design of innovation and public service reform programmes.

In addition, over time, the population shifted in its learning strategies and learning capacity. Part of the reason for variation is that some organizations had greater organizational learning capacity than others. However, as capacity and confidence increased, there was a shift from learning to adopt to learning to adapt – a greater interest in creative innovation across the population.

Population-level learning is a promising avenue for research in the field of public management. As in other disciplines which deploy population analysis it provides insights about change and transmission not available at meso and micro levels of analysis. The population level of analysis can be applied to other organizational processes too where across organizations share the same environmental vulnerability. Population studies could contribute a great deal to public administration theory, policy and practice.

There are few studies of population dynamics which have been conducted with populations of public service organizations. So this work is pioneering in some respects. It also contributes to an assessment of the value and possible modification of population-level theories more generally, taking into account public as well as private sector organizations.

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the recent literature. *Health Services Management Research*, 24:213–218.

Table 1: Comparison of four frameworks relevant to population studies

	Population ecology	Neo-institutionalism	Diffusion of innovation	Population-level learning
Indicative writers	Hannan and Freeman(1977); Hannan et al (2007)	Lammers and Garcia (2014); Micelotta et al (2017)	Rogers (2008) Greenhalgh et al (2013)	Miner et al (1999); Miner and Haunschild (1995)
Uses concept of population	Yes	Yes, but less frequently than field	No. Uses concept of social system	Yes
Theory relevant to public services	Weak in that the focus is on market competition, adaptation and organizational death. However, some quasi-markets exist and some providers fail due to mal-adaptation.	Yes, covers regulation of organizations and addresses legitimacy questions	Yes, many examples are in public and third sectors	Relevant but examples all from industrial and private sector
Examines innovation	Yes, through adaptation	Focus more on change than on innovation per se but relevant	Yes	Yes
Examines learning	Recognises necessary but not examined	Institutional work includes interest in actors and translation processes but not learning per se.	Mentioned but not elaborated and need for research recognised.	Focus of the framework

Table 2: Respondents making use of learning from attending Beacon events 2004 and 2006

	Percentage of respondents 2004 (n= 448)	Percentage of respondents 2006 (n = 360)	χ^2
Taken part in at least one learning event**	41	68	55.01
Beacon Open Day**	30	58	56.62
Beacon workshop, seminar or study tour**	22	40	25.72
Web-based material on Beacon**	20	39	28.83
National learning exchange conference**	10	16	7.14
Working with a Beacon authority**	4	16	34.11
Other type of Beacon event or activity**	6	15	16.78

** p<.001 Chi-square test

Table 3: Organizational capacity in Beacon and non-Beacon local governments

	2004						2006					
	Beacon		Non-Beacon		t	sig	Beacon		Non-Beacon		t	Ssg
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Managers and staff know how to identify gaps for learning and improvement	3.32	.744	2.89	.826	4.020	.000***	3.56	.760	3.11	.804	3.430	.001**
Elected members, managers and staff regularly take part in learning networks with other agencies	2.89	1.048	2.53	.962	2.708	.007**	3.30	.909	2.61	1.020	4.206	.000***
Managers and staff regularly seek out ideas for service improvement	3.47	.765	3.02	.785	4.395	.000***	3.80	.833	3.33	.852	3.347	.001**
We encourage bringing in new ideas from outside the organisation	3.50	.791	3.18	.828	2.968	.003**	4.06	.793	3.46	.910	4.422	.000***
Managers and HR officers understand how to support complex learning needs	2.98	.789	2.69	.953	2.552	.011*	3.20	.808	2.78	.948	2.785	.006**
Managers and staff use performance data in everyday work	3.48	1.022	2.99	1.003	3.683	.000***	3.84	.866	3.62	.951	1.447	.150
Links with national agencies are a source of ideas and improvement	3.14	1.001	2.74	.857	3.296	.001**	3.20	.926	2.90	.945	1.949	.053
Staff can easily access the information they need to do their job effectively	3.45	.817	3.08	.909	3.156	.002**	3.86	.700	3.51	.750	2.832	.005**