

Isomorphic Difference

Familiarity and Distinctiveness in National Research and Innovation Policies

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Isomorphic Difference: familiarity and distinctiveness in national research and innovation policies

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Highlights

Presents standardization and contextualization as a key policy issue

Offers a new conceptual approach to isomorphic-difference relations

Connects social scientific literatures with regard to science and innovation policy

Provides an illustration from one national policy context (Denmark)

Competing interests

The authors have no competing interests to declare.

Keywords

Isomorphism; research and innovation policy; institutional theory; organizational studies; science & technology studies; policy translation.

Abstract

Global research and innovation policies appear remarkably similar on a number of dimensions, including preferred principles of clustering and partnership, an emphasis on research-led growth and a focus on 'hot topics' such as nanotechnology and big data. However, policies for this field also reflect deeper-rooted traditions, institutional processes and ways of working: what looks the same can be very different when viewed in context.

In this paper, we first consider the evidence for convergence across research and innovation policies before outlining perspectives based on contextual difference. Drawing particularly upon institutional theory, organizational studies and Science & Technology Studies (STS), we introduce the concept of 'isomorphic difference' as a means of symmetrically exploring relations of familiarity and distinctiveness. An illustration from Danish research and innovation policy is developed in order to bring together these analytical but also policy-related issues. In addition, an initial analytical framework is presented. Finally, the relevance of 'isomorphic difference' to larger contemporary debates over the direction of research and innovation is summarized.

1) Introduction

One striking phenomenon across research and innovation policies world-wide is the recurrence of certain models, frameworks and ideas (Flink and Kaldewey, 2018; Flink and Peter, 2018; Godin, 2017; Lemola, 2002; Pfothenauer et al, 2019). Internationally, a link between research investment, successful innovation, and governmental action is being made and enacted – accompanied by calls for the development of regional ecosystems, the building of new partnerships and clusters, the strengthening of university-industry collaborations, and the establishment of state-sponsored funding mechanisms to stimulate innovation-led growth.

At times, this is presented in the form of positive possibilities for change: building a successful future based on ‘world-class’ excellence, business creation and entrepreneurship; seizing research-driven opportunities; educating the next generation of highly-motivated research talents; solving grand challenges. At others, the risk of ‘being left behind’ in the global race for innovation and research-led development is identified as a significant threat. As one influential think tank expressed the changing ‘atlas of ideas’ over a decade ago:

‘We used to expect new ideas to come from the universities and research laboratories of major companies in the US and Europe. Technology flowed from this innovative core to the technologically dependent periphery. No more. The core and periphery are being scrambled up. Places that were on the margins of innovation ten years ago ... are now essential stopping-off points in the continuous flow of people, ideas and technologies around the world.’ (Leadbetter and Wilsdon, 2007, p.9)

On the one hand, the ‘scrambling up’ of core and periphery suggests a dynamic, and even unpredictable, pattern of change as ‘people, ideas and technologies’ travel across nations and organizations. On the other, this can be seen as a remarkable standardization as countries with distinctive traditions, institutions and historical contexts adopt a common agenda and toolbox. As the former European Commissioner has expressed this, in terms which would sound as familiar in Beijing as they do in Brussels: ‘This means creating the right ecosystems, increasing investment, and bringing more companies and regions into the knowledge economy.’ (European Commission, 2016, p.86).

In observing this general pattern, however, it is important not to lose sight of significant, and potentially persistent, differences, tensions and cross-currents. These differences not only relate to the scale of national R&D investment and the relative level of socio-technical development. Cross-national (and cross-contextual) differences can also reflect deeper-rooted traditions, local processes of interpreting and enacting policy ideas, ways of working and institutional logics (Horst and Irwin, 2010; Jasanoff, 2005; Waldorff et al, 2013). Thus, a commitment to ‘partnership’ can be identified in many settings. Nevertheless, to give one simple example, the practical meaning of partnership-making is likely to be very different over coffee, cakes and multi-coloured Post-its in Copenhagen than in equivalent encounters in Beijing, Brussels or Palo Alto, even if coffee is served in all of these places (and even if ‘local’ ways of working are also subject to changing preferences, cross-contextual borrowing and fashions). Likewise, Chinese scientific research publications (and R&D expenditure) may have increased dramatically over the last two decades. Still, this does not mean that either the university system or individual universities operate in the same way across all places in China. Whilst the discussion of recurrence, standardization and homogenization suggests broad convergence around a common rhetoric of socio-scientific development and associated institutional practices, the existence of

significant and persistent differences raises a question mark against the idea that all the world will come to resemble (at least in this regard) Silicon Valley or Shenzhen.

The relationship between convergence and difference (or familiarity and distinctiveness) raises many questions about the diffusion, translation and co-production of ideas and practices. The notion of convergence as applied to national research and innovation policies represents an important part of the picture (Lemola, 2002). However, it cannot alone do full justice to the complexities, multiplicities, contradictions and contingencies of actual policy development and enactment. Nevertheless, the opposite case is equally important: that an emphasis only on 'complexities, multiplicities, contradictions and contingencies' cannot identify cross-national trends and the international exchange of models, concepts and modes of thought. We present the balance between these standardizing and contextualizing influences as crucial to the theory and practice of contemporary research and innovation policy.

Conceptual development around these questions is therefore required. However, this is also an issue of considerable policy significance. As Doezema et al have discussed with regard to Responsible Research and Innovation (RRI), it is important to consider how such a concept can travel across borders without serving 'as a blunt or problematic instrument' (Doezema et al, 2019, p.3). The concern here is that an approach designed to be both flexible and contextually-sensitive can end up as a crudely-standardized import into diverse policy contexts. As Doezema and colleagues express the underlying policy question for RRI: 'what values and practices should remain constant as it moves into different contexts, and what elements should emerge from localized engagement around these ideas?' (Doezema et al, 2019, p.2). To offer another prominent example, there have been strong criticisms of specific applications of the National Innovation Systems (NIS) framework for failing to take account of 'situated socio-political contexts and local realities' (Delvenne and Thoreau, 2012: see also Sharif, 2010; Williams and Velasco, 2016). Once again, the question of how 'standard' ways of thinking and working are enacted in particular settings - and how specific settings have influence over standard practices and processes - assumes great relevance for research and innovation policy.

The approach taken in this paper challenges the idea that the global diffusion of concepts and institutional forms is a one-directional or unstoppable process – or else that successful research and innovation policy is simply a matter of selecting the best ideas world-wide (what Lemola has termed 'competitive imitation': Lemola, 2002, p.1482). This argument of course applies equally to the spread of good practices (as is claimed for RRI) and to the global adoption of what Delvenne and Thoreau characterize as 'reductionist' and 'reified' policy systems.

Later in this paper, we will draw upon a particular example from Danish policy-making. In partial anticipation, it is not difficult to identify 'global' trends at work within that nation's research and innovation policies: for example, the call for improved research quality across the scientific system is hardly unique to Denmark. However, the form which that call has taken, the specificities of its expression and the manner in which such a 'global' idea is turned into 'local' practice all reflect the particular Danish context. Rather than presenting a simple clash between homogenizing pressures and local factors, the approach in what follows is to draw attention to what we call isomorphic difference: i.e. the manner in which ideas and practices not only travel but also emerge, develop, and are in different ways domesticated.

The issues under consideration can be approached from a number of empirical and theoretical angles. Here, we start with some 'classic' discussions within Institutional Theory and Science and Technology Studies (STS). DiMaggio and Powell's 1983 outline of 'institutional isomorphism', on the one hand, and

Fujimura’s 1988 and Pinch and Bijker’s 1984 accounts of the social construction of facts and artefacts, on the other, are very far apart in perspective and ambition. Nevertheless, when combined, the concepts of ‘isomorphic pressures’ and ‘closure mechanisms’ draw attention to the manner in which organizational forms, practices, ideas and artefacts become standardized. The central point here is that ways of working and knowing can both move across borders and take relatively fixed forms (serving in Latour’s terms as ‘immutable mobiles’: Latour, 1987). Following that discussion of convergence, stabilization and sameness, we will consider some of the ways that STS and organizational studies in particular have addressed issues of difference, contextuality and change.

2) How do different ways of thinking and working end up the same?

In their hugely-influential paper published in the American Sociological Review, Paul DiMaggio and Walter Powell begin with Max Weber and the forces which Weber saw as driving the rationalist order of capitalism towards the ‘iron cage’ of bureaucratization. For DiMaggio and Powell, ‘[o]rganizations are still becoming more homogeneous, and bureaucracy remains the common organizational form’ (DiMaggio and Powell, 1983, p.147). However, structural change in organizations is ‘less and less driven by competition or by the need for efficiency’ (ibid). Instead, DiMaggio and Powell point to ‘processes that make organizations more similar without necessarily making them more efficient’ (ibid). At its core, the concept of isomorphism seeks to capture this idea of homogenization: ‘isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions.’ (ibid, p. 149)

DiMaggio and Powell provide many examples of institutional isomorphism in practice. One case that they do not consider, but where their analytical frame can be very usefully employed, is national research and innovation policies. The notion of isomorphism has been extensively discussed, critiqued and developed since DiMaggio and Powell’s original publication (for examples from the public sector see Frumkin and Galaskiewicz, 2004; Radaelli, 2000). We argue that this metaphor (Czarniawska, 2014, p.114) and the related typology are specifically valuable as a way of capturing some key aspects of homogenization – or ‘sameness’ – in research and innovation policies.

DiMaggio and Powell identify three mechanisms through which isomorphic change occurs – even if these mechanisms do, as DiMaggio and Powell acknowledge, ‘intermingle in empirical setting’ (DiMaggio and Powell, 1983, p.150): Table One represents these in terms of ‘isomorphic pressures’ within the international research and innovation policy system.

Table One: Isomorphic pressures within national research and innovation policies

Coercive	Mimetic	Normative
Regulatory standards, patenting and intellectual property rights International peer review and journal requirements Codes of research ethics	‘Getting to Silicon Valley’ Big science Travelling concepts and ideas (including National Innovation Systems)	Professional networks Think tanks, consultancies and innovation centres The visionary role of start-ups, entrepreneurial activities, and science-led futures

Applying the concept of coercive isomorphism in the context of national research and innovation policies, a number of elements come to prominence: including global regulatory standards (for example, Demortain, 2012). Another obvious case concerns the continued pressure on China, especially since it joined the World Trade Organisation, to comply with international intellectual property standards. A possibly more subtle form of coercive pressure can be identified in the operation of international peer review and publication requirements. International discussions concerning research ethics also represent a pressure on local systems to adopt common standards of integrity and transparency.

In their discussion of mimetic processes, DiMaggio and Powell suggest that '[o]rganizations tend to model themselves after similar organizations in their field that they perceive to be more legitimate or successful' (DiMaggio and Powell, 1983, p.152). Mimetic factors appear especially important for the themes discussed in this paper, with Silicon Valley functioning as an endlessly-repeated 'innovation ecosystem' model for regional and national policies world-wide (Benner, 2018, p.110). Whether for reasons of national prestige or the possible innovation spin-offs, it is hard also not to see a strong element of mimeticism in the 'big science' strategies adopted by many countries.

Flink and Kaldewey (2018), and Flink and Peter (2018) have drawn attention to 'travelling concepts' and the power of models and metaphors across national settings. Thus, these authors identify 'frontier research', 'grand challenges', 'responsible research and innovation' and 'excellence' as ideas which offer a certain simplicity and coherence but also widespread appeal. In that way also, such notions can provide a sense of stability amongst actors – and tap into larger cultural movements and tropes. In a similar analytical vein, Godin has explored the historical emergence and diffusion of certain models of innovation: including the linear model of innovation but also the widespread uptake of 'system' models and, notably, National Innovation Systems (NIS) (Godin, 2017). Other policy-focused travelling concepts include the triple helix (Etzkowitz and Leydesdorff, 2000), mode 2 (Gibbons et al, 1994), post-normal science (Funtowicz and Ravetz, 1993) and open innovation (Chesbrough, 2003).

Normative isomorphism is closely linked by DiMaggio and Powell to professionalization. Both research itself and research and innovation policies generally are marked by the strong presence of professional networks and international associations: including the activities of the OECD, numerous policy forums and conferences, many think tanks and consultancies, influential academic journals and editorial boards, and large numbers of information-gathering visits and exchanges. One can additionally note under this heading the normativity that lies at the heart of many policy statements. To offer one notable European example: 'We owe it to the European Citizens. We owe it to the future generations. Let's dare to make Europe open to innovation, open to science and open to the world.' (European Commission, 2016, p.88).

In our discussion so far of 'how things end up the same' we have moved beyond organizational forms and practices so as to incorporate the world of policy-making and travelling concepts. As already noted, DiMaggio and Powell's much-cited paper has encouraged many further developments within institutional and organizational studies – often in ways that anticipate the discussion that follows of 'difference-making' (for example, Beckert, 2010; Czarniawska, 2004; Strandgaard Pedersen and Dobbin, 2006). We see the typology of isomorphic pressures as a powerful way of capturing one key aspect of contemporary research and innovation policies: namely, the fact that certain common institutional forms, ideas and practices propagate across different political and institutional settings.

Looking across the social sciences, there are other conceptual resources that can be employed. In particular, one focus within Science & Technology Studies (STS) has been on the way in which scientific ideas become standardized and 'black boxed'. Fujimura's 1988 study of cancer research – or what she more provocatively terms the 'molecular biological bandwagon' – provides a notable example here. Scientists require stable assumptions and working conditions (or standardized packages of theory and technologies) if they are to conduct 'doable' research. This allows for incremental development in scientific knowledge production. It also permits the appearance of objectivity as separate research teams are able to achieve comparable results. Seen in this way, what can be presented as convergence and standardization is also a means of providing cognitive stability and necessary simplification (see also Fujimura, 1987; 1992).

Pinch and Bijker in another classic STS study have noted both the 'interpretive flexibility' and the 'closure mechanisms' which can be found within the development of new technologies (1984). There were initially many variants on the now-familiar bicycle – including the famous 'Penny-farthing' but also the 'Boneshaker' and 'Lawson's Bicyclette'. Whilst linear models of the innovation process might present the development of one relatively standardised form as an inevitable process of the best design winning out, Pinch and Bijker draw attention to multi-variance, to interpretive flexibility and to the part 'which different closure mechanisms may play in the stabilization of the artefacts' (ibid: p.419). Applying these ideas to research and innovation policy, we can see that (to paraphrase Pinch and Bijker) there is not just one way of formulating a policy. Instead, 'different chains of problems and solutions' lead to 'different developments' (ibid: p.419). However, mechanisms of 'closure and stabilization' are essential. In the case discussed by Pinch and Bijker, this involved both 'rhetorical closure' and 'closure by redefinition of the problem':

'Closure in technology involves the stabilization of an artefact and the 'disappearance' of problems. To close a technological 'controversy' the problems need not be solved in the common sense of that word. The key point is whether relevant social groups see the problem as being solved.' (ibid: pp. 426-427)

The notions of isomorphism and closure draw upon very different scholarly traditions and perspectives. Notably, DiMaggio and Powell's account directs our attention to large-scale patterns arising from institutional processes whilst the STS approach is much more focused on specific socio-technical interactions. Taken together, however, we are alerted to the ways in which 'standardized packages' (in Fujimura's terms) of concepts and practices become widely shared and adopted. Bringing an STS and an institutionalist perspective together also emphasizes the dynamic relationship between organizational forms, processes and policy ideas.

There are many possible approaches to research and innovation policy and there is substantial scope for multi-variance across highly complex, shifting and uncertain contexts. But what can be termed 'isomorphic pressure' or 'stabilization' provides a way of collectively making policy 'doable'. Indeed, even the idea that there is a discrete entity known as 'research and innovation policy' depends upon the acceptance of certain common assumptions and stabilized understandings: where does innovation policy end and industrial policy – or basic research - begin? Why should national policymakers link research to innovation rather than, for example, to education? Perhaps ironically, a focus on 'sameness' also serves to heighten our awareness of potential differences.

3) Perspectives on difference

A focus on differences in this context suggests attention to the particular manner in which policies are formulated and developed and to the specificities of their enactment. Once again, a range of conceptual resources could be employed for this purpose. However, and to extend the discussion begun in the previous section, one significant strength of STS research since the 1970s is its close attention to the diverse social and material practices through which 'technoscience' is conceptualized and performed (Felt et al, 2017; Sismondo, 2010; Yearley, 2005). Thus, the notion of co-production, or co-construction, addresses how the social and the technical are defined alongside – and mutually shape – one another within particular settings and practices. As Jasanoff has expressed this: 'we gain explanatory power by thinking of natural and social orders as being produced together' (2004, p.2).

Viewed from a co-productionist perspective, policies for research and innovation create governance frameworks but also reflect larger understandings, assumptions and ideas. These might relate to the perceived connection between research investment and economic growth, the need to engage in global competition and globally-oriented innovation or the very idea that research and innovation can be centrally planned. The point of the co-productionist perspective is to be sensitive to the specific circumstances within which these assumptions and ideas are worked out.

As a second approach to difference-making, the concept of ethno-epistemic assemblage draws upon Actor-Network Theory (ANT) in order to explore how different actors, people, technologies, forms of knowledge, social relations and objects mix together (Irwin and Michael, 2003). The argument is that relations between science and society are not simply given or pre-formed. Instead, even what might appear to be precisely-defined policy statements, innovation fields and practical developments are contextually shaped – and contextually understood – in multiple ways. This means both that a considerable amount of institutional and cultural work is needed to turn standard policies into enacted local practices, and that the same policies can be understood, operationalized and performed in very diverse fashion.

A third important concept here is translation. In illustration of the conceptual flow between STS and organizational studies, Czarniawska and Joerges have argued that 'translation' has a meaning beyond its narrow linguistic interpretation (Czarniawska and Joerges, 1996, p.24). In one illustration of this larger meaning, Czarniawska has observed that an idea does not travel on its own: 'It moves because of human curiosity and interest in new things, and it moves by the way of the energy produced by each translation.' (Czarniawska, 2014, p.111)

Building on Latour's (1986) critique of the idea of 'diffusion', a 'translation' perspective suggests that power is not concentrated in one object, that multiple parties are active participants rather than passive recipients, and that specific technologies and policy frameworks are not fixed but re-defined according to particular context. Instead of a diffusion (or transmission) model of homogeneous change, the emphasis is on the transformation and translation of initial ideas, objects and processes into meaningful ways of acting and sense-making. To quote Sahlin-Andersson in discussion of Latour: 'It is a process in which the story of what has happened is constantly rewritten as it spreads. The imitating organization and the imitated prototype are continuously reinterpreted and reformulated. A success story cannot be explained by its origin, as the success is produced in the process of translation.' (Sahlin-Andersson, 1996, p.82) As Czarniawska has put this in her theory of organizing: 'The translator is needed because there is a movement of people and objects; had they stayed at the same place, there would be no need for translation' (2014, p.150). Whilst stories of success are important within research and innovation policy so too are stories of real or potential failure: of being left behind, of missing the next 'hot topic', of failing to run fast enough (Report of the Independent Expert Group on R&D and innovation, 2006).

In the previous section we argued that there are distinct conceptual advantages to bringing together the notion of ‘isomorphic pressure’ with STS concepts such as closure and stabilization. Similarly, we suggest that these overlapping perspectives on difference-making can augment and strengthen one another. In order to illustrate this point, we will now focus on one case of attempted isomorphism across countries and cultures. This case as developed by Pfotenhauer and Jasanoff (2017) considers an initiative aimed at implementing the ‘MIT model’ in a British, Portuguese and Singaporean setting. The ‘MIT model’ is widely admired as a demonstration of how a university can play a major role in encouraging entrepreneurship and growth across a region. However, and as Pfotenhauer and Jasanoff’s analysis strongly suggests, the attempt to recreate this approach elsewhere actually highlighted contextual differences in ‘the imagination, implementation and uptake of the model’ (ibid, p.787). These differences in turn throw a sharp light on the ‘unique social, political and cultural determinants that underwrite innovation policy’ (ibid, p.787).

According to Pfotenhauer and Jasanoff’s account, the launch of the Cambridge-MIT Institute (CMI) in the UK led, not to innovation effects that would permeate both the local region and the British university landscape, but instead to the Institute being regarded by Cambridge University academics as a kind of ‘add on’: a helpful support for existing activities but not a fundamental change. Meanwhile, parallel initiatives in Portugal and Singapore had very different outcomes.

If we consider this case in terms of the language of co-production, then a number of ‘difference-making’ points become clear. These, alongside the implications of the other two concepts considered in this section, are summarized in Table Two.

Table Two: Perspectives on difference

Co-production	Ethno-epistemic assemblage	Translation
Significant variations across settings	Range of actors and networks required to enact change	Attention to the movement of ideas and practices across settings
Distinct innovation cultures	Different roles being played by similar actors across settings	Processes of the disembedding and reembedding of ideas
Multiple definitions of success and failure	Capacity of specific assemblages to adopt, reject or subvert isomorphic change	Contexts of change and re-interpretation
‘Innovation’ as a contextual outcome rather than a fixed construct	Power as the product of networks rather than as an input	The rewriting of ‘success stories’ across different settings

Viewed according to the idiom of co-production, one can say that the ‘same’ innovation model was constructed differently across the three settings: depending on the perception of the challenges being addressed, the context of enactment and the understanding of the model itself. ‘Success’ (and failure) in each case came to be defined very differently – but characteristically emerged during the initiative rather than being explicitly expressed beforehand. For Pfotenhauer and Jasanoff, the implication also is that innovation should not be seen as a unitary concept but ‘as a plurality of imaginations of innovation’

(Pfotenhauer and Jasanoff, 2017, p.801): 'Innovation models are not sets of practices that travel unchanged across social, cultural, and jurisdictional boundaries. Rather, they are responses to local imaginaries that reflect countries' prior conceptions of, and justifications for, the need for innovation....' (ibid). This point also reminds us that the use of 'nations' as markers of specific innovation styles or models can be imprecise – the 'style' in question may be tied to a particular regional, temporal or institutional arrangement - and even culturally stereotyping, saying very little, if anything, about the way broader trends are established or picked up in particular settings.

If we now consider this case from the perspective of ethno-epistemic assemblages, one can begin to identify the web of specific actors and networks which are required to re-construct the 'MIT model' in particular settings: infrastructures and architectures of different kinds; people (from policy makers to academics and from administrators to exchange students, business professionals and politicians across nations, regions and organizations); educational programmes and frameworks; contracts and agreements; political, research and industrial institutions; bodies of knowledge; legal structures and interpretations; and, not least, sources of finance. This also means that different elements of each assemblage can play a different role in different contexts: for example, academic staff can boost the change-making potential of the MIT model in one context but impede it in another.

On the one hand, this case undeniably suggests the capacity of a specific innovation model, centred in one US university, to influence activities at an international level. On the other, one can identify the power across assemblages to adopt, reject or subvert attempts at creating isomorphic change. Either way, power from the perspective adopted in this section is not an intrinsic characteristic of individual actors or actants. Instead, it is better understood as the outcome of contextual negotiations and of the localities within which particular innovations are imagined, co-produced and assembled.

Finally, attention to translation in this setting leads us to consider the processes by which ideas and practices travel (Czarniawska and Joerges, 1996). Rather than simply diffusing from one setting to another, the 'MIT model' must be codified, disembedded from its original setting, packaged (or objectified) in some way, communicated, legitimated and explained, re-embedded in a new setting, and re-institutionalised (Czarniawska and Joerges, 1996). This involves a 'success story' being told and re-told – and often told in different ways and at different times to different audiences.

As we will discuss in the next section, the concept of 'isomorphic difference' emphasizes the manner in which even isomorphic pressures and standardized modes of closure must be co-produced in particular settings, supported by specific assemblages but also translated into specific forms. The point again is not to prioritize either converging or diverging influences over one another. Instead, we suggest that a symmetrical¹ focus on both the 'isomorphic' and the 'difference' dimensions of research and innovational policies raises important questions, not least concerning what gets 'packaged' in to policy and what gets left out.

4) Isomorphic difference

¹ 'Symmetry' here is an explicit link to the long-standing principle within STS that different forms of explanation (whether 'true' or 'false') should be analyzed in the same fashion (Bloor, 1991; Law, 2017; Sismondo, 2010). Here our basic point is that one should approach both converging and diverging pressures in a methodologically-parallel fashion.

In the above discussion, we have emphasized some of the familiar (or ‘sameness’) elements which have appeared across international research and innovation policies. From the impact of Intellectual Property Rights agreements to travelling ideas, concepts and models, we identified strong trends towards standardization, homogenization and ‘stabilization’ in the operation of policy systems. We next explored the general case for specificity, contextual sensitivity and analytical attention to difference. From this perspective, neither a single model of innovation nor a single form of innovation policy can simply impose itself across different settings but must be imagined, translated and enacted within specific contexts and assemblages.

The question which arises now is how these perspectives can be brought into more productive, and more symmetrical, engagement. This is not a trivial task. However, and as others have argued (Lyll and Tait, 2019; Martin, 2016; Soete, 2019), there are significant benefits to be gained from such scholarly engagement across academic fields and intellectual traditions. The good news here is that, as has been suggested in both the previous sections, productive interactions are already occurring across STS and organizational studies in particular.

One starting point for this discussion is provided by Benner’s account of science, technology and innovation policies in China (2018). Evidence can be found in that setting both of policy coherence and centralized planning, and of a ‘much more distributed and decentralized system with multiple power points and centres’ (Benner, 2018, p.42). In discussing Chinese research and innovation policy, therefore, it is at least partly a matter of analytical choice whether one emphasizes the broad historical direction of central government policy or the inevitably more complex and cross-cutting picture of ‘multiple power points and centres’. The implication of Benner’s analysis is that there are considerable benefits to be gained from maintaining attention to both these dimensions.

Other areas of scholarship further enrich our analytical approach. Thus, in a parallel discussion concerning the possible isomorphism of global standard-setting, Demortain has argued that international food standards ‘emerge from transnational interactions between local sites, and between local sites and global scenes. Standard-setting cannot be reduced to a top-down process that bypasses national authorities and local actors.’ (Demortain, 2012, p.14; see also Rothstein et al, 1999). Relatedly, Borrás and Edquist have drawn upon an innovation system perspective in order to address the issue of ‘policy mixes’ (Borrás and Edquist, 2013; see also Borrás and Edquist, 2019; Kivimaa and Kern, 2016).

Considering these issues in broader sociological terms, there is a clear linkage between the themes of this paper and contemporary debates around ‘globalisation’ and, more particularly, the notion of ‘glocalisation’ (Drori et al, 2014; Robertson, 1994). Going further, Wilk (1994) has drawn upon an ethnographic discussion of beauty pageants in Belize in order to argue that there is a basic paradox of globalization: in each case a global phenomenon (a beauty competition – and perhaps a research and innovation policy) must be made into a local practice. At the same time, each local practice is caught up with larger relations of uniformity. From this perspective, a simple assertion of the dualism of the global and the local misses the inter-connecting forces at work – what Wilk refers to as ‘global systems of common difference’. Once again, the implication is that we should not think of ‘isomorphic difference’ as necessarily representing a point of impact between different processes, institutions and ideas but as providing a multi-faceted interplay between local and global forces.

In an important contribution, Beckert (2010) has argued that, whatever DiMaggio and Powell’s original intention, the new sociological institutionalism has given undue analytical weight to isomorphism. The point is that, rather than setting up studies to look for either homogenization or its opposite, one ‘must

rather ask much more openly which of these two tendencies is observed' (Beckert, 2010, p. 163; see also Alvarez et al, 2005; Bromley et al, 2012). We strongly support this case for empirically-symmetrical analysis. Moreover, from a constructivist perspective the point is that concepts of 'sameness' and 'difference' do not just exist in the world but need active interpretation and co-creation. As Czarniawska and Sevón have elegantly put it: 'Organizations of the same type introduce identical innovations but, when queried by researchers, claim to have invented them themselves. Or the other way round..' (1996, p.2). In a similar spirit, Vedel and Irwin have argued that difference-making (or '(un)aligning') in the setting of research collaboration is not simply a matter of identifying pre-existing 'gaps' but also of contextually constructing relations of difference and similarity (Vedel and Irwin, 2017). The suggestion is that isomorphic differences are a matter of active sense-making and sense-giving (Smerek, 2011). The line between isomorphism and difference is not pre-configured but open to flexible and shifting interpretations.

Bringing these points together, one key overarching issue concerns the interplay between isomorphic and difference-making processes within particular research and innovation policy settings. Such an approach strongly implies that isomorphism and difference should be considered in relational terms, and as in dynamic and mutual engagement.

In order to illustrate and develop this conceptual discussion we will now explore the operation of isomorphic difference in one specific context. We will be guided in what follows by three empirical questions:

- What is the relationship between national or regional policies and practices, and globalized policy frameworks?
- What social and organizational processes underpin and facilitate this relationship?
- How do actors make sense of and explain this relationship?

5) Isomorphic difference: a Danish illustration and framework

Denmark is by no means a research and innovation superpower. However, it does score highly in terms of many research excellence and innovation indicators (Danish Council for Research and Innovation Policy, 2017). In addition, it provides a good example of a country where research and innovation policy has been under rather intense discussion for some time – and where this area of policy is seen to be significant for the development of the nation². Thus, the most recent major policy statement on research and innovation policy, officially translated into English as 'Denmark – ready to seize future opportunities' (Danish Government, 2017/2018), comes in the wake of previous documents with titles such as 'Denmark – a nation of solutions' (Danish Government, 2012) and 'The future of Europe depends on knowledge' (Danish Ministry of Science, Innovation and Higher Education, 2012). Some flavour of these publications can be taken from the title page of this last document: 'together we must nurture talent and innovative capacities to transform knowledge into competitive and innovative products, industries and services' (Danish Ministry of Science, Innovation and Higher Education, 2012, p.1).

Are these policy approaches to be understood as the product of a particular Danish societal model (Esping-Andersen, 1990; Campbell and Pedersen, 2014)? Or are they better interpreted as a local variant

² For a review of the Danish research and innovation system see: European Commission, 2019.

of global trends across OECD countries? Going further, and as Lemola has provocatively enquired: does it make sense any more to talk about ‘national science and technology policies’ (2002)? One could argue that, as a smaller nation, lacking in natural resources (apart from wind energy) and eager to compete globally in research and innovation, Denmark would have a tendency to isomorphism. However, the opposite hypothesis could also be presented: with its national university founded in 1479, its main scientific academy now past its 275th birthday and its relatively large investment in education (and high labour costs), the Danish nation might have a tendency to ‘difference’ and exceptionalism.

Looking across Danish research and innovation policy over the period 2000-2020, there have been some rather constant features. Among these one can identify an abiding emphasis on research excellence, which is often presented as the basis for other elements such as the drive to national competitiveness and a concern with the utilization of research (in education, in business, in solving grand challenges, in achieving economic growth). However, it is also apparent that over time specific elements have been brought to the fore or else de-emphasized: some initiatives come and go, often linked to the political leadership of the relevant government ministry. Thus, Lindvig and Hillersdal (2019) have discussed the manner in which interdisciplinarity became identified as a strong priority within research and innovation policy. However, in their account of one Danish university, this supposed point of emphasis remained at some distance from everyday research practices and the monodisciplinary orientation of the institution in question.

Although there have been various Danish policy statements and initiatives over the past few decades, the 2017 publication, Denmark – ready to seize future opportunities (‘Danmark – klar til fremtiden’), represents a particularly comprehensive approach. Two broad objectives for Danish research and innovation are stated here. First of all, Danish research must be of the highest international quality. Secondly, research must provide the best possible benefit for society. A number of specific areas of initiative are outlined under each objective. These are summarized in Table Three.

Table Three: Danish research and innovation policy

Denmark – ready to seize future opportunities (December 2017): Key Points	
<i>Objective One: Danish research must be of the highest international quality</i>	<i>Objective Two: research must provide the best possible benefit for society</i>

The top of Danish research must be of a Nobel Prize-level	Research and innovation must promote the development and use of new technologies
The quality of research must be boosted across the whole scientific spectrum	Knowledge and innovation must create more value in businesses
Talented researchers must have attractive career opportunities	More research must translate to practice in the public sector
Denmark must be at the forefront of international research infrastructure	The evaluation of qualification criteria for researchers should promote research, education and knowledge dissemination
Danish participation in international research and innovation collaboration must be boosted	Building bridges between research and the public
	A stronger Danish research and innovation system with close collaboration and better cohesion

As even a cursory glance at Table Three will confirm, Danish policy for this area suggests both globally-familiar and distinctive elements. The proposition that ‘Talented researchers must have attractive career opportunities’ is highly recognizable across settings. The same can be said for ‘Research and innovation must promote the development and use of new technologies’ and the argument for boosting research quality ‘across the whole scientific spectrum’.

However, the statement that ‘The evaluation of qualification criteria for researchers should promote research, education and knowledge dissemination’, accompanied by the creation of an expert group, might appear less familiar – and actually causes some translation challenges (in this account we have used the official English translation where available). The underlying issue of how to acknowledge the contribution of academic staff beyond their research publications is extremely recognizable in international terms. However, the particular means of addressing this issue – in a government policy document, requiring the creation of an expert group to represent the whole sector, aiming to change practice across the national research system – is deeply embedded in the Danish tradition of central coordination and finding shared solutions (Horst and Irwin, 2010: 2015).

To pursue this discussion of isomorphic-difference relations further we can consider the first point under Objective One. The promotion of a number of ‘Nobel prize centres’ with the aim of creating ‘research results that can compete with the absolute best international research’ is familiar across many national contexts. The commitment to Nobel Prize-winning research may therefore be recognizably isomorphic. However, the form in which this is expressed and the relationship to a specific cultural and institutional imaginary exhibits strong elements of contextual distinctiveness: ‘We will work so that more researchers in the future can bring Nobel prizes home to Denmark’ (Danish Government, 2018, p.6)

Special note in this discussion must be taken of one of the key points within Objective Two, officially translated as ‘Building bridges between research and the public’. Given that Denmark has received international attention for its development of an inclusionary approach to public engagement – not least through the operation of ‘Danish-style consensus conferences’ (Horst, 2014) – one might anticipate that this section would demonstrate particular distinctiveness. However, the presentation begins in

rather familiar terms with fake news, ‘alternative facts’ and the need to distinguish between facts and opinion. Researchers should engage in public debate – but they should also distinguish between their expert role and personal views. Practical initiatives here include continuation of an annual research festival and a planned population survey to shed light on Danes’ knowledge about and trust in research. It is hard not to view such measures as operating in traditionally ‘deficit model’ terms (Horst, 2014; Horst and Irwin, 2010). The implication is that whilst one sometimes finds difference amidst apparent isomorphism, the opposite pattern can also occur.

A final note can be offered about who – and what – is expected to govern these ‘future opportunities’ and bring them to pass. Although this is very much a governmentally-led strategy, particular thanks are given by the Minister to the so-called Disruption Council with which the government discussed its developing strategy. This Council had a special responsibility to build a ‘partnership for Denmark’s future’ based on technological opportunities and the creation of a new labour market. Membership was drawn from a wide range of senior stakeholders including the Danish Prime Minister and various other government ministers. Meanwhile, the government document refers to a number of active participants and stakeholders, including (but not restricted to): young people, Danish businesses, private foundations, employees, ‘top researchers’, committees and forums, demonstration programmes, universities, infrastructures, international institutions, funding models, technologies, entrepreneurs and the general population. This represents a complex assemblage across Danish society and beyond, explicitly recognizing that, while Government can take a lead, future research and innovation in this context depends upon large-scale cooperation – including the continued operation of well-institutionalized norms and routines connecting government, employers and trades unions.

Drawing upon the brief account of this Danish case but also the conceptual discussion in the previous sections, an initial framework for the analysis of isomorphic difference can be presented: Table Four.

Table Four: A framework for isomorphic difference in national research and innovation policy

<i>Sub-questions</i>	<i>Key concepts and tools</i>
What is the relationship between national or regional policies and practices, and globalized policy frameworks?	<ul style="list-style-type: none"> • Relative influence of isomorphic pressures • Policy as reflecting global developments but also contextual characteristics • Co-production of research and innovation policy and a sense of identity • Global systems of common difference • Requirement for methodological symmetry
What social and organizational processes underpin and facilitate this relationship?	<ul style="list-style-type: none"> • Distinctive processes of policy formation and response • Mechanisms of closure and standardization • Relevance of governance structures and associated claims to legitimacy and authority • Role of specific actors and assemblages in shaping and enacting policy

	<ul style="list-style-type: none"> • Multiple power points and centres
How do actors make sense of and explain this relationship?	<ul style="list-style-type: none"> • Point of perspective from the nation leads to a particular construction of the isomorphism-difference relationship • Interplay of isomorphism and contextual distinctiveness: bringing ideas ‘home’ • Importance of translation processes • Flexible and shifting interpretations of the need for policy and change • Stories of success and failure

Picking out some key aspects of Table Four with regard to the Danish case, and turning to the question concerning the relationship between this Danish vision of socio-technical innovation and more globalized frameworks, it is very hard not to see this policy statement as reflecting isomorphic pressures – but also their particular significance and meaning within the Danish policy context. This co-produced national framework is permeated with a strong sense of the international setting for research and innovation policy. One can present this as both isomorphic and distinctive, and the need for methodological symmetry requires that attention should be paid equally. However, the over-riding point is that this is a relationship between the two elements rather than a clear separation or binary divide. One way of capturing this is through the previously-introduced notion of ‘global systems of common difference’.

Moving to the second question concerning the influence of particular social and organizational processes, examples have already been given to support the argument that isomorphic tendencies are enacted within specific contexts. The statement that ‘Research and innovation must promote the development and use of new technologies’ is of course recognizable across many international settings. But Danish science and innovation policy-making is distinctive (although not necessarily unique) in compiling a catalogue of its knowledge needs based on extensive engagement with a very broad spectrum of stakeholders (Danish Agency for Science and Higher Education, 2018, p.220). In the Danish setting, this level of engagement and consensus-seeking is a crucial mechanism of policy closure and stabilization.

This point leads directly to the role played by different levels of governance within the practice of research and innovation policies. The governance model developed in this policy statement is of the national government as the lead organization and the democratically-chosen expression of the national interest, but working closely across all parts of the research and innovation system. In that way, central authority is assumed by the national government, but on the basis of society-wide cooperation and partnership.

The assemblage at the core of this document consists primarily of national actors and actants – even if it is also one which is open to the need for ‘international research infrastructure’ and makes a call for ‘Danish participation in international research and research collaboration to be boosted’. This might not be unexpected given that this is a governmental statement. However, there are alternative assemblages relating to matters of research and innovation in this specific setting which do not entirely fit within this national point of perspective: cross-national consortia; foreign researchers working in Denmark with

strong external ties; Danish researchers with international qualifications, commitments and allegiances; industries and processes of knowledge production which do not have a single 'home'.

What then of the third question concerning specific forms of sense-making and explanation, and their role in constructing a narrative of familiarity and distinctiveness? The fundamental point here is that the identification of the nation as the central focus for research and innovation policy-making has profound consequences for the enacted relationship between isomorphism and difference. The specific policy document under discussion clearly draws upon a keen sense of Denmark operating in a larger global context, even if many of the challenges faced (including new areas of technological development but also questions of climate and the environment) are not unique to any specific nation.

Many of the ideas expressed are very recognizable in international terms; including the drive towards Nobel prize-winning quality, career development for researchers, investment in research infrastructure and the harnessing of knowledge and innovation to create more value for businesses. However, what this policy document further suggests is that the expression of isomorphic ideas is not enough but that such ways of thinking must be 'translated' into local language, institutional practices and contexts. It is not just Nobel prizes that are being 'brought home', but also ideas, concepts and ways of working. In so doing, these familiar tendencies are given local meanings, interpretations and emphases. At the same time, our discussion here implies that concepts (such as 'research excellence') which might appear isomorphic are inevitably caught up with particular institutional, cultural and political framings – including in this example an important national debate about the relationship between 'free' (or curiosity-driven) and 'strategic' research.

6) Conclusion

In this paper, our aim has been to draw attention to isomorphic-difference relations and to cast these in new conceptual light. More ambitiously, our argument is that opening up relations of isomorphic difference to larger analytical and empirical scrutiny can both bring new understanding to current policy processes and widen the range of perspectives and disciplines that become relevant. In that spirit, we have drawn primarily upon institutional theory, organizational studies and STS, but also cultural anthropology, innovation studies and sociology. We are very aware that this by no means exhausts the analytical and intellectual possibilities. We are also aware that research and innovation policy may not be the only field where isomorphic difference is of significance. We should add too that in this discussion we have largely focused (as in the Danish document) on the national policy level. However, there is no reason in principle why isomorphic difference could not also be explored at cross-national, regional or organization-specific levels.

Looking forward, the most pressing step is to develop empirical studies which can enhance and enrich the framework presented here. On the one hand, the topic of isomorphic difference is well-suited to comparative analysis. Reflecting on this Danish case, it is interesting, for example, to consider whether some regions and organizations have a greater absorptive capacity for global ideas than others (Horst and Irwin, 2015). On the other hand, the actual sites of the performance and enactment of isomorphic differences are important in themselves, drawing attention to the more mundane and localized settings within which such interplays are made material: specific partnerships and collaborations, contracts and agreements, funding decisions and incremental changes (Woolgar and Neyland, 2013). Isomorphic difference is not simply a matter of tracking the international flow of ideas and influences, but also of exploring how local discussions, processes and practices come to be expressed in globally-recognizable language.

Going further, it is important to consider the relationship between isomorphic difference and larger contemporary debates about the form and direction of research and innovation policy (for example, Kuhlmann and Rip, 2018; Kuhlmann et al, 2019; Schot and Scheinmueller, 2018; Stilgoe et al, 2013; Stirling, 2008). The concept of isomorphic difference may not in itself tell us how to address internationally-recognised problems or implement Responsible Research and Innovation (RRI). However, it can give greater insight into the relationship between such general discussions and the local conditions within which specific policies are developed and established. Viewed from the perspective of this paper, movements in research and innovation policy are not simply a 'battle of ideas' nor a movement from 'centre' to 'periphery'. Instead, cross-national influences must find their place among the contextual interpretations and understandings, processes of co-production and competing assemblages which together constitute 'global systems of common difference' (Wilk, 1995).

Despite the apparent tendency for research and innovation policy scholars to focus on isomorphic trends, common problems and global challenges, we are reminded that it is at least as important to pay attention to multiple forms of meaning-making, understanding and knowledge development. Local settings matter – and not only in terms of 'absorbing' external influences but also generating new policies and possibilities. In that sense, analytical attention to difference appears just as significant for research and innovation policy as a focus on larger policy movements and cross-national patterns. Certainly, study of the relationship between isomorphism and difference should open up a much-needed debate about alternative socio-technical futures and their connection to the particular contexts of policy-making and practice.

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