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The position of place in governing global problems: A mechanistic account of place-as-context, and analysis of transitions towards spatially explicit approaches to climate science and policy☆

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ABSTRACT

Place is a central concept within the sustainability sciences, yet it remains somewhat undertheorised, and its relationship to generalisation and scale is unclear. Here, we develop a mechanistic account of place as the fundamental context in which social and environmental mechanisms operate. It is premised on the view that the social and environmental sciences are typically concerned with causal processes and their interaction with context, rather than with a search for laws. We deploy our mechanistic account to critique the neglect of place that characterised the early stages of climate governance, ranging from the highly idealised general circulation and integrated assessment models used to analyze climate change, to the global institutions and technologies designed to manage it. We implicate this neglect of place in the limited progress in tackling climate change in both public and policy spheres, before tracing out recent shifts towards more spatially explicit approaches to climate change science and policy-making. These shifts reflect a move towards an ontology which acknowledges that even where causal drivers are in a sense global in nature (*e.g.* atmospheric levels of greenhouse gases), their impacts are often mediated through variables that are spatially clustered at multiple scales, moderated by contextual features of the local environment, and interact with the presence of other (localised) stressors in synergistic rather than additive ways. We conclude that a relentless focus on place, heterogeneity, and context can maximise (rather than limit) the policy relevance of climate change science and help to ensure the development of policy interventions that are robust and effective.

1. Introduction: place, causal mechanisms, and sustainability

Place is a central concept within many traditions of sustainability science (Kates et al., 2001). The rough idea is that whilst many modern environmental and development problems are in some senses global in character, they are nevertheless the products of diverse actions that are highly contextual, exert their impacts through causal chains that are heterogeneous across space in form and effect, and require policy responses

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that take account of this variety and complexity (*e.g.* Lejano and Ingram, 2007; Scott, 1998). As such, many sustainability scientists restrict their methodological focus to relatively micro-level analysis (place as location), on the grounds that this is the most practical scale for uncovering the heterogeneous causal mechanisms at play (*e.g.* Wilbanks and Kates, 1999), for eliciting local knowledge, and for designing effective interventions. Yet the concept of place within sustainability science remains somewhat under-developed. In particular, its (uneasy) relationship to abstraction and generalisation remains unclear, and there are unresolved methodological problems surrounding how to address interactions across places and spatial scales (Liu et al., 2013a). This slightly paradoxical situation – where place is both a central concept of sustainability science, and also a rather under-theorised and unclarified notion – is mirrored in many other academic disciplines (Casey, 2013).[1]

For example, Aristotle developed a theory of the causal agencies that places possess by virtue of their locatedness, heterogeneity, and multi-dimensionality (Morison, 2002; Casey, 2013), and more recently phenomenologists have addressed what it means to *be* in place (Heidegger, 1971). However, in the intervening millennia place rather fell out of use as a philosophical concept, being replaced by a preoccupation with absolute and unbounded space (Casey, 1996, 2013). Sociologists, meanwhile, have always been interested in *types* of places – the home, the workplace, the prison – although often without taking a spatially explicit focus. Indeed the late 20th century saw many social theorists argue that revolutions in communications and transportation had transcended place (Coleman, 1993) or rendered it "phantasmagoric" (Giddens, 1990), by removing the drag imposed by location and distance on human interaction (Gieryn, 2000). However, more empirically minded sociologists have continued to focus on the highly contextual and spatially patterned nature of social processes (Gieryn, 2000), from both interpretive and mechanistic perspectives (*e.g.* Sampson, 2012). Statisticians do not speak much of place *per se*, but have always been concerned with external validity – the question of whether inferences drawn from a particular study can be generalised to contexts that differ in terms of environmental features or populations (*e.g.* Cox, 1958). On the other hand, the natural and physical sciences have historically focussed on the discovery of laws, *i.e.* fixed and invariant regularities (Cartwright, 1989, 1999). Here, context or place-effects are broadly seen as confounders or sources of variance to be screened out or adjusted for (Guala, 2003), so as to isolate the general principles or equations that govern relations between objects. However, this sits alongside an awareness that there is often a significant amount of knowledge of local conditions required to predict the implications of general laws. More controversially, scholars from "science studies" have problematised context-free accounts of scientific knowledge production (Collins, 1981; Ophir and Shapin, 1991), focussing on how social and cultural environments shape the production of scientific facts, and on the labour intensive activities (*e.g.* standardisation, the construction of physical and social networks, *etc.*) required to make facts travel across place and scale (Powell, 2007).

Place, in short, plays an important though contested role in how many disciplines conceive of and study the world, although the term (or cognate concepts) is defined and deployed in quite differing ways. To an extent, this is unavoidable, given the widely varying epistemological and methodological commitments held by interpretive sociologists compared to, say, statisticians, and it would be somewhat ironic if place as a concept turned out to have universal features. So on the one hand, this interpretive flexibility is quite natural and useful, but on the other it may limit theoretical development and the cross-fertilisation of ideas across disciplines. This paper seeks to address this problem, through developing a conceptualisation of place broad enough to accommodate many of these distinct epistemological and methodological commitments, and then deploying it in a case study that draws, in a targeted fashion, on the published literature on climate science and policy making. Our research aims are to:

1) Develop a mechanistic account of place that focuses on the relationship between causal processes and particular contexts;

We then deploy our mechanistic account to:

2) Trace the historical roots of spatially blind approaches to governing global problems to the logics of modernity, necessarily in a schematic fashion;
3) Highlight the neglect of place in the early years of climate change science and policy, which we implicate in the difficulties faced in engaging publics, informing decision-making, and in reducing emissions; and
4) Account for recent transitions towards more spatially explicit approaches to climate change science and policy making.

1.1. *Conceptual framework: a mechanistic account of place-as-context*

Here we introduce our conceptualisation of *place as the fundamental context* in which social and environmental mechanisms operate, drawing on the ideas of Sampson (2012, 2013) and Cartwright (1999). Our focus is orthogonal to the humanistic accounts of place which focus on interpretative (*e.g.* sense of place) or phenomenological aspects (*e.g.* being in place) (see Casey, 1996). Our conceptualisation can best be understood by contrasting it with the Galilean ontology, which views causal mechanisms as producing universal and fixed effects independent of context (Cartwright, 1999). From the Galilean perspective, place is a mere stage in which the laws of the social and natural world play out. The place-as-fundamental-context ontology (Sampson, 2012, 2013; Cartwright and Pemberton, 2013; Cartwright, 1999), by contrast, views causal mechanisms as often being sharply bounded in scope (rather than operating universally), and sees their form, operation, and effects as variable (heterogeneous) and context-dependent. Cartwright and Pemberton (2013) class this as reflecting an Aristotelian ontology, wherein place

[1] We do not discuss the well-theorised interpretive accounts of place prominent within human geography because our account, developed later, draws on a mechanistic perspective.