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Turning Back the Rising Sea: Theory performativity in the shift from climate science to popular authority

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Abstract

Action on climate change continues to be hampered by vested interests seeding doubt about science and the need to reduce carbon emissions. Using a qualitative case study of local climate adaptation to sea level rise, we show how climate change science is translated into a self-referential theory focused on property prices. Our analysis develops two mechanisms – enablement and theorization – to explain the relationship between theory performativity and power within a process of translation. This contributes to (1) the performativity debate by showing how the constitution of power relations shapes theory performativity; (2) theories of power, by tracing the ways in which certain actors are able to enrol others and impact the authority of particular theories, and (3) processes of translation by developing mechanisms for following the ways in which power and theory performativity interact. We conclude by arguing that a performative understanding of how power shapes beliefs is central to combating the failure to address climate change.

Keywords

climate change, performativity, power, translation

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Introduction

Worsening climate change impacts such as record-breaking temperatures, wildfires and sea level rise have been identified by scientists for many years. These impacts have broadened the discussion around climate change beyond reducing carbon emissions and towards the need for local adaptation (Porter, Demeritt, & Dessai, 2015). However, just as global and national politics have failed to halt the world's ever-increasing carbon emissions (Spash, 2016), attempts at climate adaptation are also constrained by political dynamics (Barnett, Waters, Pendergast, & Puleston, 2013).

An important factor underlying the failure to address climate change has been the political strategy of vested interests in seeding doubt about climate science (Wright & Nyberg, 2015). In particular, the global fossil fuel industry has been instrumental in promoting an agenda of climate denial (McCright & Dunlap, 2010). This is symptomatic of what is described by some as 'post-truth' politics, dominated by 'alternative facts' (Knight & Tsoukas, 2019), within which all forms of technical expertise face a crisis of democratic legitimacy (Callon, Lascoumes, & Barthe, 2009). Nowhere is this trend more salient than in the polarized debate over climate change, where actors have been mobilized to challenge climate science and delay public policy and action.

Ironically, actor-network theory (ANT) which was once presented as challenging any form of scientific authority, is now called upon to either defend climate science (Kofman, 2018), or at least provide an understanding of how resistance to climate science is taking place (Porter, Kuhn, & Nerlich, 2018). Although there has been debate about the criticality of ANT as a vehicle for social change (see e.g. Alcadipani & Hassard, 2010; Gond & Nyberg, 2017; Whittle & Spicer, 2008), ANT scholarship can offer a set of powerful conceptual tools to clarify the role of scientists and their theories in such controversies (Callon, 1986; Callon & Latour, 1981). The potential challenge to scientific authority is recognized by Callon (2009) in describing how carbon markets aimed at emissions mitigation were formed in the interplay between the design of theory and rearrangements in practice. The stability of a theory thus requires alignment with political actors' interests, which, in turn, shapes how it is translated into practice (MacKenzie, 2006). This highlights both the role of actors in providing legitimacy to a theory and the performativity of theories in the translation to the local situation.

Our research investigates the interactions between power and theory performativity in a qualitative study of the public controversy surrounding a plan to implement climate adaptation policies for sea level rise. Using interviews with key actors, policy documents and media coverage, we explore the political struggles over climate adaptation in the local government area of Lake Macquarie, Australia. The region is particularly vulnerable to sea level rise and the local council has been at the forefront of climate adaptation planning in Australia (Connor, 2016). Our analysis shows the translation of climate change theory, based on peer-reviewed scientific projections, into a popular, self-referential theory focusing on property prices.

By explaining the local translation from scientific projections to concern for property value, we make three general contributions. First, we show how theories shift from a generic, to an effective, and ultimately to a 'self-referential' Barnesian mode (MacKenzie, 2007). This adds to the performativity debate by explaining how the constitution of power relations shapes the performativity of theory in becoming self-fulfilling (Martí & Gond, 2018). Second, we show how power relations are generated in the community through the *enrolment* of actors in ways which eventually undermine scientific authority in climate adaptation (d'Adderio & Pollock, 2014). Finally, the two mechanisms of *enablement* and *theorization* allow us to document the interactions between theory performativity and power as occurring within a process in which a new, local theory was generated and acted upon in a self-referential manner (Barnes, 1983), even without support from science, experts or material evidence (Bourgoin, Bencherki, &

Faraj, 2019). By outlining how scientific authority loses out to popular authority, we can better trace the issues of power which are embedded in the current lack of much-needed climate action (Nyberg, Spicer, & Wright, 2013).

The Performativity of Theories: Making Power Dynamics Explicit

Performativity was defined by Austin (1962, p. 12) as doing things with words, a performative utterance being one 'in which to *say* something is to *do* something; or in which *by* saying something we are doing something'. While this initial emphasis on speech acts was developed with a focus on the effects of everyday language, the performativity concept has travelled widely across the social sciences, and ultimately organizational scholarship, to take multiple, and at times contradictory, meanings (for an in depth discussion of this, see Gond, Canantous, Hardy, & Learmonth, 2016). The key aspect is the distinction between the representation of the world and the world itself (Austin, 1962), in that the practice of representation takes part in producing that which it represents.

One important stream of performativity research investigates how theories shape reality (Barnes, 1983; Callon, 1998; MacKenzie, 2006). This perspective extends Austin's (1962) insights from language to knowledge in order to investigate how theories constitute, rather than represent, the world. For example, economic theory 'performs, shapes and formats the economy, rather than observing how it functions' (Callon, 1998, p. 2). In this perspective, it is not only speech acts or language that is performative, but theories, as a particular set of knowledge, can change and develop as they are engaged with. Within organization studies, scholars have shown how theory performativity is translated into social reality. This has been noted in: the case of 'rational choice theory' being actively mobilized in the consultancy practice of decision analysts (Cabantous, Gond, & Johnson-Cramer, 2010); how modularity theory was used to produce new organizational routines (d'Adderio & Pollock, 2014); and how a management theory changes assemblages, and therefore, reality, during performativity (Carton, 2020). These performativity studies show that theories matter in shaping organizational actors' capacities for action.

Research has further clarified such capacity by distinguishing between (1) 'generic performativity', which corresponds to the actual use of a concept, (2) 'effective performativity' corresponding to cases in which theory makes a difference to economic processes and (3) 'Barnesian performativity' where 'an effect of the use in practice of an aspect of economics is to make economic processes more like their depiction by economics' (MacKenzie, 2007, p. 56). Martí and Gond (2018) have reorganized these three types of performativity into a processual framework that specifies the boundary conditions for performativity, suggesting theories are more likely to have impact if they enrol powerful initial backers such as high-status academics, practitioners or firms. Accordingly, this model emphasizes the importance of power dynamics in shaping the initial stage of the performativity process, whereby different types of social actors are able to access certain types of theory.

Martí and Gond's (2018) processual model, however, has been critiqued for its overly linear depiction of how performative properties are acquired and its emphasis on scientific authority (d'Adderio, Glaser, & Pollock, 2019; Garud & Gehman, 2019). Garud and Gehman (2019, p. 683) call for clarifying how power relations affect performativity as 'theories and practices [are] constituted, deconstituted, and reconstituted as arrangements change'. This view underlines the collective nature of theorization (Cabantous & Gond, 2011), and its role in the crystallization of beliefs about causal links that may become performative (Martí & Gond, 2018). Through performativity, theories shape actors' capacities for action (Cabantous et al., 2010), which, in turn, are subjected to power dynamics (Gond & Nyberg, 2017).

We argue that power is both productive and enabling (Law, 1990), suggesting that power is continually constituted in practice through social relations. This notion of power is stated as 'power to' (Barnes, 1988), in opposition to 'power over', the latter of which is often critiqued for being both immeasurable and totalizing. Rather, power is processual and existing *in actu* rather than *in potentia* (Latour, 1986) – embedded in processes of negotiation and re/produced through the assembled configuration of relationships between human and nonhuman actors (or actants) (Gond & Nyberg, 2017). In emphasizing the constitution of power through social relations we do not presume the latter are 'purely social'; rather, in understanding how power works we seek an exploration of how 'discursive ordering strategies (in part) shape, and are embodied in a range of different materials' (Law, 1990, p. 166). Thus, power is evident in theory performativity as much as it is enacted through social relations.

Although these prior insights suggest that power dynamics are inherent to the whole process of theory performativity rather than specific to one of its stages, more research effort is needed to fully appreciate how power dynamics are involved in the performativity of theories. That is, how the assemblage of actors shapes theory performativity. Explaining how power operates through theory performativity involves adopting compatible and processual conceptualizations of both *power* and *theory performativity*.

Conceptualizing Power Dynamics and Theory Performativity Through Translation

To analyse theory performativity and power dynamics in a way that recognizes their relational and processual nature, we rely on the ANT concept of translation (Callon, 1986). Translation explains how the interests of human and nonhuman entities are actively defined and redefined in order to be aligned with each other (Callon, 1986; Callon & Latour, 1981). The concept of translation provides us with a relational and processual take on the constitution of power. By definition, translation work involves the re/creation of power relations:

> [By] translation, we understand all the negotiations, intrigues, calculations, acts of persuasion and violence, thanks to which an actor or force takes, or causes to be conferred on itself, authority to speak or act on behalf of another actor or force. (Callon & Latour, 1981, p. 279)

The politics of translation can involve actors promoting a theory, with translation configured by 'enrolling' various entities and 'aligning' their interests through providing them with a social role, identity and framing of a problem (Callon, 1986). If the entities accept these definitions of their interests, roles and problems, they become 'allies' and will support the work of translation (Callon, 1986).

Enrolment, therefore, is key to the successful translation of a theory, and can help account for theory performativity. It is through enrolment of actors (or actants) in the local assemblage that power is situationally composed (Latour, 1986). Studies of theory performativity show how authority, as an elevated position within power relations, is constituted by management gurus who influence organizational processes through the continuous assembling of human and nonhuman entities (Carton, 2020; Ligonie, 2018). These studies show how through the politics of translation, actors (1) mobilize human and nonhuman actors and (2) align interests in promoting beliefs and justification for causal links in explaining the local situation – a theory – outside the scientific realm.

In addition, the concept of translation equips us with a vocabulary to analyse theory performativity (Cabantous & Gond, 2011; Carton, 2020; Ligonie, 2018). The translation approach to theory performativity is consistent with prior studies which have highlighted the continuous assemblage

of human and nonhuman entities involved in theory performativity within and through organizations. For instance, decision analysts have to craft hospitable organizational environments to perform 'rational choice theory', shape organizational decision making and therefore build their consultancy markets (Cabantous et al., 2010), whereas modularity theory is used to produce new organizational routines (d'Adderio & Pollock, 2014). This prior research provides empirical evidence that theories are both 'relationally material and politically performative' (Gond & Nyberg, 2017, p. 1136) in the sense that they shape actors' capacities.

Returning to our empirical interest, our initial research questions guiding the investigation were: *How is climate change science understood in local situations? And, how are local power dynamics shaping this process?* That is, the research questions require us to trace the 'events, activities and trajectories' (Cloutier & Langley, 2020, p. 4) occurring within translation of climate change to focus on property prices. In order to do this, we develop a process model of the policy development which we use to unpack *theory performativity* and *power.*

Methods

Case study context

Our paper investigates the development of climate adaptation policies in the local government area of Lake Macquarie in Australia. The region is situated around a large coastal lake, and is particularly vulnerable to flooding, which scientists predict will be exacerbated by sea level rise and extreme weather events induced by climate change. This vulnerability was highlighted in 2007 during a major storm event which saw the lake rise by one metre and in a 2009 report from the Federal Department of Climate Change listing Lake Macquarie as among the six local government areas in Australia most vulnerable to sea level rise. This, along with growing awareness of climate change, led Lake Macquarie City Council to implement a range of adaptation policies.

In 2008, the council published its *Sea Level Rise Preparedness Adaptation Policy*, which required new buildings in at-risk areas to be built 2.85 metres above ground. In 2011 the council updated its flood risk management plan, leading to the identification of 7,000 properties vulnerable to sea level rise and suggesting development restrictions to adapt to the problem. Upon notifying property owners of their assessment, council employees and councillors (politicians) were criticized over concerns that the identification of the risk of sea level rise would devalue their properties. Council employees then engaged residents from two of the affected suburbs in an intensive consultation process. Despite the initial focus on climate adaptation, in 2016 the final plan adopted a 'wait and see' approach based on future 'trigger points' of sea level rise with no additional funding for implementation. While lacking any tangible adaptation measures, the final plan appeased community concern over property values, gaining the approval of those involved in the consultation process, and winning the council several awards for its collaborative efforts.

Data collection

The empirical material collected for this study includes 385 documents and 46 interviews with stakeholders and experts (see Table 1). The documents published between 2007 and 2019 include council reports, policy literature and community newsletters from Lake Macquarie City Council, scientific papers referred to in the development of adaptation policies, conference papers from council employees and community members on climate adaptation planning, and extensive media coverage. Media coverage made up the bulk of documentation, with 206 articles from the local paper, the *Newcastle Herald*.

Table 1. Summary of empirical data.

Data type	Description	Total no.
Participant interviews		**46**
Category and code	**Role**	
Business and industry (BI)		13
BI#1	Land valuer	
BI#2	Journalist	
BI#3	Property developer	
BI#4	Sustainable building	
BI#5	Urban planning	
BI#6	Insurance	
BI#7	Commercial development	
BI#8	Commercial real estate	
BI#9	Property developer	
BI#10	Water consultant	
BI#11	Planning consultant	
BI#12	Economics consultant	
BI#13	Journalist	
State government employees (SG)		3
SG#1	Current – manager, science division	
SG#2	Former state government employee – science	
SG#3	Current – science	
Experts (EX)		3
EX#1	Consultation expert	
EX#2	Water and erosion expert	
EX#3	Social impacts expert	
Politicians (PO) – councillors and ex-councillors		7
PO#1	Local councillor (Liberal Party)	
PO#2	Local councillor (Labor Party)	
PO#3	Former councillor (Labor Party)	
PO#4	Former councillor (Labor Party)	
PO#5	Former mayor	
PO#6	Former mayor	
PO#7	Former councillor (Greens Party)	
Council (CE) – employees and ex-employees		10
CE#1	Former employee – consultation facilitator	
CE#2	Former employee – consultation facilitator	
CE#3	Current employee – management	
CE#4	Current employee – co-ordinator	
CE#5	Current employee – community consultation	
CE#6	Former employee – management	
CE#7	Former employee – co-ordinator	
CE#8	Former employee – management	
CE#9	Current employee – consultation facilitator	
CE#10	Former employee – management	

(Continued)

Table 1. (Continued)

Data type	Description	Total no.
Community organization members (CO)		10
CO#1	Land owner – involved in local consultation	
CO#2	Land owner – community organizer from neighbouring region	
CO#3	Land owner – involved in local consultation	
CO#4	Land owner – involved in local consultation	
CO#5	Land owner – involved in local consultation	
CO#6	Local environment group organizer	
CO#7	Land owner – involved in local consultation	
CO#8	Regional environment group organizer	
CO#9	Regional environment group organizer	
CO#10	Regional environment group organizer	
Documents		
Conference papers	Papers presented by council staff and residents on adaptation planning (14) Scientific papers on climate adaptation in Lake Macquarie (2)	16
Websites	Sourced from: Lake Macquarie City Council (3) Residents group (1) Property Council of Australia (1) CoastAdapt (2)	7
Newspaper articles	Sourced from: *Newcastle Herald* (234) *Sydney Morning Herald* (6) Australian Broadcasting Corporation (10) *The Australian* (6) *Daily Telegraph* (3) *Newcastle Star* (3) *Lakes Mail* (2) Central Coast Express Advocate (2)	266
Government documents	Cross-Council Reports (2) Federal government (5) New South Wales government (6, including 2 parliamentary hansard items) Lake Macquarie Council (38)	51
Reports	Hunter Councils (5) Expert reports (10) Lake Macquarie City Council (20) Industry (1) New South Wales government (1) Commonwealth Scientific and Industrial Research Organisation (2) National Climate Change Adaptation Research Facility (6)	45

BI, business and industry; CE, council employees and ex-employees; CO, community organization members; EX, experts; PO, politicians – councillors and ex-councillors; SG, state government employees.

Table 2. Temporal bracketing of the translation process, key documents and events.

Stages of theory translation	'Climate change' established as a concern	'Climate change and sea level rise' become linked	Concern for property prices becomes self-referential
Description	*Growing awareness of climate change (2007–2009)*	*Linking climate to flood and planning policies (2009–2011)*	*The idea that property values have declined because of climate adaptation plans becomes self-referential (2011–2016)*
Key documents	• IPCC (2007) *Fourth Assessment Synthesis Report* • Department of Climate Change (2009) *Climate change risks to Australia's coast: A first pass national assessment. Commonwealth Australia* • Lake Macquarie City Council (2008) *Sea Level Rise Preparedness Adaptation Policy*	• Lake Macquarie City Council (2011) *Draft Lake Macquarie Waterway Flood Study and Flood Risk Management Plan* • Lake Macquarie City Council (2011) *Lake floods and sea level rise* (public notice)	• Lake Macquarie City Council (2016) *Planning for Future Flood Risks Marks Point and Belmont South Local Adaptation Plan*
Key events	• July 2007: 'Pasha Bulker' storm • August 2008: Lake Macquarie Sea Level Rise Preparedness Adaptation Policy adopted	• November 2011: public exhibition and consultation on flood strategy begins • January 2012: public meeting with climate sceptics Ian Plimer, David Archibald and Robert Carter • February 2012: Council's consultation process begins	• December 2015: draft adaptation plan on public exhibition • March 2016: Lake Macquarie City Council adopts Marks Point and Belmont South Local Adaptation Plan

While this documentation provided insight into how adaptation policy was presented to the local community and developed over time, we sought to explore how different stakeholders represented their own roles and made sense of the power dynamics within the policy debate. For this purpose, we contacted participants from key groups involved in the policy debates. Between late 2017 and early 2019, we conducted 46 interviews with participants from business and industry (BI), politicians – councillors and ex-councillors (PO), council employees and ex-employees (CE), community organization members (CO), experts and consultants (EX) and state government employees (SG). The 46 semi-structured interviews covered topics such as participants' involvement in council policy, views on climate change, relationships with other stakeholders and opinions on the process and policy outcomes. The interviews lasted between 32 and 94 minutes and were fully transcribed.

Analysis

Given the multiple sources and types of data, analysis was carried out in two steps. The first stage of analysis (see Table 2) involved identifying the key events and actors involved through a review

of key council and media documents. Using this information and adopting a 'temporal bracketing' strategy (Langley, 1999), we identified key stages of the controversy that correspond to distinct stages of theory translation, seeking to understand the ways in which different configurations of knowledge, as represented in key documents, were used by the various actors. We noted that while the initial concern was climate change, this shifted towards the prioritization of property values, which resulted in the 'wait and see' approach in the final plan. Making use of media coverage, these changes in emphasis appeared to come about at particular times and were related to salient events in the community.

While such mapping provided insight into the events surrounding the changes in theory translation, we sought to understand the *mechanisms* within each phase of temporal bracketing. That is, our aim was to go beyond the linear explanation of events, to gain an insight into how certain actors were able to influence the continuities and discontinuities within the process (Cloutier & Langley, 2020). This required a second stage of analysis, in which the interview and document data were imported and coded in detail using the qualitative data analysis software QSR NVivo.

In the analysis, we coded for comments about the adaptation policy, property impacts, climate change, and views of other stakeholders, paying particular attention to causal explanation and how these were justified and put into practice throughout the process of policy consultation and development. Thus, we noted in the coding participants discussing ways in which they recruited others in the community to their own views, and the influence these views and actions had on the outcome and focus of the final adaptation plan. We were thus able to identify specific 'theoretical mechanisms recurring over time' (Langley, Smallman, Tsoukas, & Van de Ven, 2013, p. 7), which functioned to shift the parameters of the debate (Tables 3, 4 and 5).

As outlined in Table 3, a key mechanism in the process of translation derived from the existing literature was *enrolment* (Callon, 1986), consisting of three aspects or 'movements'. The first movement of enrolment involved specific actors being *mobilized* to represent a particular position – for instance, the council making use of the expertise of scientific information. The second movement involved the *alignment* of interests – an aspect of enrolment which was perhaps most clear in relation to the shared concerns about property prices between real estate agents, property developers and property owners. The third movement occurred when different actors were engaged to *amplify* particular viewpoints, such as through the media, or the recruitment of climate sceptics to suggest the council's actions were unnecessary.

However, we noted that before enrolment could take place, it was apparent there was another primary mechanism which created the conditions for particular actors to become involved. We termed this initial mechanism *enablement* to describe how theories provided the actors with capacity to act (see Table 4). That is, the presumptions behind the theory (i.e. the scientific authority of science) or notification of its consequences (in institutional texts) enabled a range of actors to engage with the translation process. Finally, following the interaction of enablement and enrolment, a third and final mechanism was evident in our data – which we termed *theorization* – which informed the shifting beliefs around causal links (see Table 5). For example, participants from the council saw the predictions of the Intergovernmental Panel on Climate Change (IPCC) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) as providing an imperative to act, as well as the basis for a theorization about the impact of climate change in the region. Yet as others became enabled to participate, this theorization was altered by differing priorities that informed beliefs around whether climate change was likely to have an impact in their area, to the idea that the council was causing property prices to fall. These two mechanisms – enablement and theorization – explain the process through which theory performativity and power operate to change the basis of authority.

Table 3. Illustrative coding for the mechanism of enrolment.

	Description	Indicative quotes
Mobilization *Movement through which actors are enrolled to represent a particular issue*	Council involving experts in flood mapping	'This review has been prepared by consultant WMAwater for Lake Macquarie City Council and was undertaken following a review of the 1998 Lake Macquarie Flood Study, to include the June 2007 long weekend storm/flood event and incorporation of the implications of climate change.' (*Lake Macquarie Waterway Flood Risk Management Study and Plan*, p. 1, WMA Water) 'my main area of expertise in relation to this project would be around flood risk and quantifying and dealing with existing flood risk. . . . But then climate change became a thing, so you can't really do a flood risk study now without considering climate change and sea level rise, particularly on the coastal fringe.' (EX#2)
	Council making use of CSIRO to frame the problem	'The council said the best evidence from the Bureau of Meteorology and CSIRO was that "mean sea level is expected to rise by 0.4 metres by 2050 and 0.9 metres by 2100".' ('Worst case fears raise floor levels', *Newcastle Herald*, 22 July 2013) 'Lake Macquarie Council recently updated its recommendations for about 10,000 people living up to three metres above the average sea level. All their properties could be exposed to inundation and increased flood risks by the end of the century, according to guidelines developed by the CSIRO.' ('Developer may sue to trigger rethink on sea level rises' *Sydney Morning Herald*, 6 Mar 2012)
Alignment of interests *Movement through which actors' interests are connected*	Property owners linking with real estate agents	'There was woman that was involved . . . She obviously had personal skin in the game. She had a million-dollar home right on the lake at Marks Point and she felt that, you know, real estate agents and a few others that were involved instantly said, "oh climate change, oh if they're talking about that your property levels are going to, your values are going down".' (PO#4) 'There were a couple of agents and a couple of locals who had waterfront properties and they're the sort of people who stand up to be counted. Initially, really angry that this is even been raised and how dare you interfere with my life and oh gosh I'm going to lose money.' (CE#8)
	Property developers supporting residents' concerns	'A lot of them came to me and just blowing up, but how on earth am I – I thought of a class action at one stage, but how on earth am I going to fight 50 cases with 50 residents? I'd give them encouragement.' (BI#3) 'MORE than 300 people attended a meeting at Belmont 16ft Sailing Club last night to hear three climate change researchers challenge Lake Macquarie City Council's sea level rise policy. Prominent Hunter businessman Jeff McCloy called the meeting as part of his campaign for the council to review the "flawed policy".' (Cronshaw, 2012)
Amplification *Movement through which actors in positions of authority provide further support*	Engaging the media to support residents' concerns	'We would come up and attend the meetings and the number of people attending grew and we attacked the council, we wrote to them, we got media releases and at the public meetings we attacked them. We attacked them by using a level of scepticism about what they were doing.' (CO#2) 'We got some really, really heated public meetings, the media got involved and like there was a few things that fuelled the fire. One of the residents went to the media and actually said, this is what's going on and did interviews with the media.' (CE#2)
	Having climate sceptics cast doubt on the need for change	'I called a public meeting at the Sixteen Footer Club… So Professor Plimer gets up and scientifically says this is a nonsense, as did Carter, as did the other fellow. We then showed the predicted sea level rise that the council was working on which, from memory, was 800 millimetres by the end of this century, plus the fudge factor.' (BI#3) 'The two guys that were mainly involved had had issues with Gosford Council around development and stuff that had been done around Brisbane Waters. They'd also both been Senate candidates at a Federal election for the Climate Sceptics Party of Australia or something.' (PO#4)

Table 4. Illustrative coding for the mechanism of enablement.

	Description	Indicative quotes
Enablement *Mechanism by which a theory creates the circumstances to enable actors to mobilize others and to shape collective action*	Climate science enables Lake Macquarie Council to change planning and flood management policy	'Council used expert advice from scientists and the NSW Government to calculate a level for coastal and flood planning of 0.9 metres rise from 2011 to 2100.' ('Development in areas affected by sea level rise', Lake Macquarie City Council website) 'Sea level rise is from the IPCC (2007) and CSIRO (2007) reports on climate change, using their upper scenario of 0.91m.' (*Lake Macquarie Sea Level Rise Preparedness Adaptation Policy*, 2008)
	Council sending letters to property owners – enables property owners to enrol others	'We wrote to 7000 affected property owners and asked them for their input, but as part of that, the next step for that was to go through developing our first adaptation plan . . .It was sort of a perfect storm . . . we had a particularly hostile journalist at the *Newcastle Herald*.' (CE#4) 'The history of the Lake Macquarie Coastal Residents was it formed . . . when the Lake Macquarie City Council came in here and said this area is all going to go underwater and you guys have just got to disappear and everybody said "Hey!"' (CO#3)

Table 5. Illustrative coding for the mechanism of theorization.

	Description	Indicative quotes
Theorization *Mechanism by which collective actions shape new theories about cause and effect*	Incorporation of climate change to sea level rise predictions	'We do know from the Commonwealth National Assessment that Lake Macquarie's probably the most exposed place in Australia to sea level rise.' (SG#1) 'Council recognized the potential impact of sea level rise. There'd been quite a bit of background information, so we had a fair understanding of the flood hazard around the lake. There was a floodplain risk management plan for the lake itself completed in it might have been 2010. Then it was updated in 2012 to take account of the impacts of sea level rise.' (CE#3)
	Concern shifts to property prices rather than climate change	'Angry Marks Point residents are calling for the current flood mapping to be immediately withdrawn. Councillor Pauling says residents are worried the projected sea level rise information is misleading and inaccurate.' (*Lake council to release flood planning memo*, ABC News, 27 Aug 2013) 'The anger was – I think it came from that people had this flood zone, which meant that their property value was undermined. Some people were experiencing increases in their insurance premiums, so it was costing them more.' (CE#1)

The Shift from Climate Science to Property Values

Translating climate change science into local sea level rise

The first stage in the translation involved the incorporation of scientific theories of climate change into council policy. This process relied on the scientific authority of the Intergovernmental Panel on Climate Change (IPCC) and its production of Assessment Reports which review the latest published scientific literature on climate change. The IPCC report provided a range of projected

increases in average global sea level for different emissions scenarios, with the 'worst case' scenario suggesting an increase in average global sea level of 0.58 metres above the average 1980–1999 level by the end of the century (2007, p. 323).

The projections of the IPCC report were also used in the New South Wales (NSW) state government's adoption of sea level benchmarks in 2009, which predicted rises of 40 cm by 2050 and 90 cm by 2100 above 1980–1999 levels (NSW Chief Scientist and Engineer, 2012). Given that the council is responsible for flood management, the predictions in the IPCC report enabled the translation of scientific discourse of climate change into local projections of future sea level rise. As one former council employee (CE#1) argued: 'We mainly just tried to say, "this is the best practice science we've just adopted" . . . "this is the state government benchmarks but it's also supported by IPCC".' Making use of the scientific authority of the IPCC, regulations and planning procedures outlining projected climate change scenarios were incorporated in the council's *Sea Level Rise Preparedness Adaptation Policy* in 2008.

Flooding experts were then mobilized for technical assistance to identify which areas were most vulnerable to the predicted changes. This work also drew on the scientific authority of the Commonwealth Scientific and Industrial Research Organisation (CSIRO, 2007), which highlighted that that future sea level rise variations for NSW would be higher than the global average and other parts of the Australian coastline. This process of co-ordinating expert knowledge on climate change, flooding and rainfall resulted in a draft flood risk and management plan. The plan included detailed maps and data which identified properties as being at risk from the range of climate change scenarios.

By mobilizing these technical assessments, the scientific authority of the IPCC was used to specify what these estimates of future sea level rise in the local area meant for the practical aspects of building standards and infrastructure. This initial form of translation was enabled by the scientific authority of the IPCC, creating the circumstances in which changes to planning in the region were justified. After mobilizing further expertise to develop flood mapping and management proposals for the different climate change scenarios, the draft waterway plan articulated the theorization that projections of sea level rise in the Lake Macquarie area would impact the local community.

Building popular authority for a concern for property prices

Having established the scientific authority to justify the new adaptation planning measures, the council staff identified consultation as 'the next step to go through developing our first adaptation plan' (CE#4). A letter from the council was sent out 'to 7000 affected property owners and asked them for their input' (CE#4). The letter notified recipients that their property was at risk from future sea level rise and invited them to participate in consultation workshops, enabling property owners to engage with the policy process. According to one former council staffer (CE#7), seeking feedback and participation from affected residents in the design of the final adaptation plan was 'good practice'.

However, residents and property owners responded with increasing hostility. In particular, the letter brought attention to new floor height requirements, the need to flood-proof buildings, and that properties below 1.0 metre AHD (Australian Height Datum) would require sea level rise notations on their Section 149 certificates (notices used to indicate planning restrictions on a property). While these notations had been in place for some time, some residents were not aware of this:

> It was never agreed to or properly reviewed by the community, that it could be used to apply. Without a policy, you can't write on a 149, it's got to be coming from somewhere. So, they snuck this thing in. (CO#1)

While council staff argued it was a legal requirement to include the notifications on Section 149 certificates, property owners saw this as having a negative impact on the value of their properties. Thus, once the property owners' participation in the process was enabled, they began to align their interests, quickly enrolling others into debates about the policy and its impacts. Through their own networks, the property owners co-ordinated a response, which was ultimately amplified by media coverage.

For instance, following the letter to landowners, a prominent property developer, Jeff McCloy, used his position as a regional business leader to initiate a sustained campaign against the adaptation plans. Just days after the letters were sent, the local newspaper – the *Newcastle Herald* – reported McCloy was threatening legal action against the council. This announcement was made at the annual Business Chamber meeting, with comments directed to the mayor of Lake Macquarie City Council, and met with 'rousing applause' (Goffet, 2011). While this action never eventuated, McCloy was effective in enrolling a broader set of actors in the debate about the adaptation policy. An important part of resisting the changes was in challenging the initial theorization – that climate change and sea level rise meant that there was a need to implement new policies.

Property owners opposing the plans questioned the scientific authority of the policy. Climate change deniers from across the country were enrolled as participants in amplifying the debate. Two months after the initial consultation process had begun, more than 300 people attended a meeting, organized by McCloy, at which three prominent climate sceptics argued that the science had been exaggerated. As one interviewee suggested, this strategy was particularly effective in building community opposition:

> I don't think the vast majority of the community actually realise that sea levels are rising. . . if you trawl back through the *Newcastle Herald* and the history of rallies funded by developers and funding climate sceptics to come and talk at those rallies without any scientific pushback, there's been I think an awful lot of scepticism out there. (SG#1)

This was assisted by a broader context in which conservative politicians promoted climate scepticism at all levels of government. The scientific authority for the policy was further undermined when a new conservative state government removed the previous sea level rise benchmark policy (NSW Government, n.d.). Council staff spoke about this as making them reluctant to discuss climate change with property owners. However, this also left them vulnerable to attacks on the need for their policy; if the basis of sea level rise was the science of climate change, then doubts about the science suggested the policy was unnecessary.

These views were amplified when the local newspaper, the *Newcastle Herald*, was enrolled in the debate. While the paper had covered the council's policy previously, in the months following McCloy's intervention, this focus intensified. As one councillor, who was opposed to the policy, commented:

> the paper loved it. It was media pressure. It was social pressure, because I was [saying] 'I don't care whether you guys vote this up or not. I'm going to make you look like idiots tomorrow in the paper. That's how it's going to be. I don't care what you do.' I stopped trying to convince them. (PO#1)

The paper gave regular commentary on the council's plans, in particular the rejection of specific planning applications, arguing that property values were falling, and engaging in debates over the veracity of climate change projections. Soon after McCloy's statement of legal action, the paper published a cartoon of the developer, Moses-like, holding back the water of the lake as he led a procession of property owners – one of whom held a suitcase with the words 'McCloy class action'

Figure 1. Peter Lewis cartoon, *Newcastle Herald*, November 9, 2011. Courtesy of Peter Lewis and the *Newcastle Herald*.

(see Figure 1). On either side of the parted waters, the council staff, councillors and 'climate change estimates' were seen to be floundering in a turbulent sea (Lewis, 2011). In this way, the paper itself became an actor within the debate and played a crucial role in focusing the discussion towards property values.

This enrolment led to a fundamental change in the discussion around the adaptation plan and the development of an entirely new theorization about the situation – that property values were being negatively impacted by the discussion of sea level rise. Property owners thus justified their opposition to the policy by specifying that it was the council's plans and policies, rather than climate change per se, which were the problem. In this new theorization, the council's policy was positioned as an attack on private property for no genuine purpose. Property owners further strengthened their networks by enrolling others in neighbouring regions with concerns about property values to their cause. These new coalitions began to lobby the state government to intervene and impose a 30-year suspension of the policy.

The theory becomes self-referential

The property owners established the theory that property prices were being impacted by the council's adaptation plan by mobilizing actors with aligned interests and others who amplified the theory. The theory was used by the actors in the area in predicting decision making, with one real estate agent telling the local paper that the flood notations were being used by potential buyers to push down house prices. One real estate agent was elected to local government on this basis:

> around the Swansea area a real estate agent was elected in there. So it was a fair bit of a push. Whether it be that property prices went down, it affected commissions, made it harder to sell. It was for their own self-interest that sort of promoted them to get more involved. (PO#3)

The continued assertion that property prices were being affected resulted in people acting as though it were true.

The belief that the adaptation plan was impacting property prices was so deeply felt in the community that tensions continued to escalate. One former mayor said they felt that they were under 'constant attack'. This was particularly evident in community meetings, which were described by participants as heated:

> It was incredibly hostile. I remember council staff attempting to get up and speak and being shouted down. . . . . It was about as full-on as you would ever – it was just short of violence. (PO#4)

Council staff and many of the local councillors were on the defensive not only in relation to their policies, but also their legitimacy within the local area. At one public meeting, a motion of 'no confidence' in councillors who supported the adaptation policy was passed. As one expert advisor (EX#1) recalled: 'I reckon their political future flashed before their eyes and it was "we need to do something about this".'

Whether property prices were actually impacted by the adaptation plan was now irrelevant; the popular authority of the theory resulted in the organization of further community action. Residents shared stories of the impacts of the policies, on insurance premiums, the value of others' houses, and the restrictions on future development. As community opposition continued, the focus on falling property values in the local newspaper increased, with reports that between $1 billion and $4 billion would be taken off the value of homes in the affected areas, suggesting houses might be considered for demolition, or landowners might have to move or contribute to the construction of retaining walls. While council staff attempted to counter these claims, this had little influence on the concerns in the community. One former council staff member noted:

> *The Herald* wrote some amazing articles, like astronomically terrible, and if you Google now 'Marks Point' and 'sea level rise' the first story is, 'sea level rise will wipe $50 million off Marks Point'. . . So it became a self-fulfilling prophecy. (CE#2)

The impact of the climate adaptation plan on property values became the central reference for debate. Within this context, not only did residents come to negotiations demanding properties be protected, but they insisted that climate change modelling be put aside in favour of current observations. Given the community resistance to climate change as an issue, council staff chose to avoid any discussion of climate change:

> it was just two completely different conversations, and they're not talking to each other. On the one side it's the Council saying, 'this is about protecting – mitigating risk, protecting you and about responding to what's going to happen'. Then on the other side you've just got people talking about their property values and money. (CE#1)

Responding to the objections about climate change, council staff shifted discussion to 'future planning' and 'trigger points', making the key point of reference the protection of property. In this context, climate change as an issue would only be 'resurrected' once future impacts threatened properties. This compromise led to a reduction in community opposition and was viewed as a success in appeasing community concerns about property prices rather than implementing changes to reduce future climate change impacts.

Performativity and Power in Theory Translation

Our findings highlight the relationship between power and theory performativity by showing how the translation process shifted a debate about climate adaptation, which was first developed on the

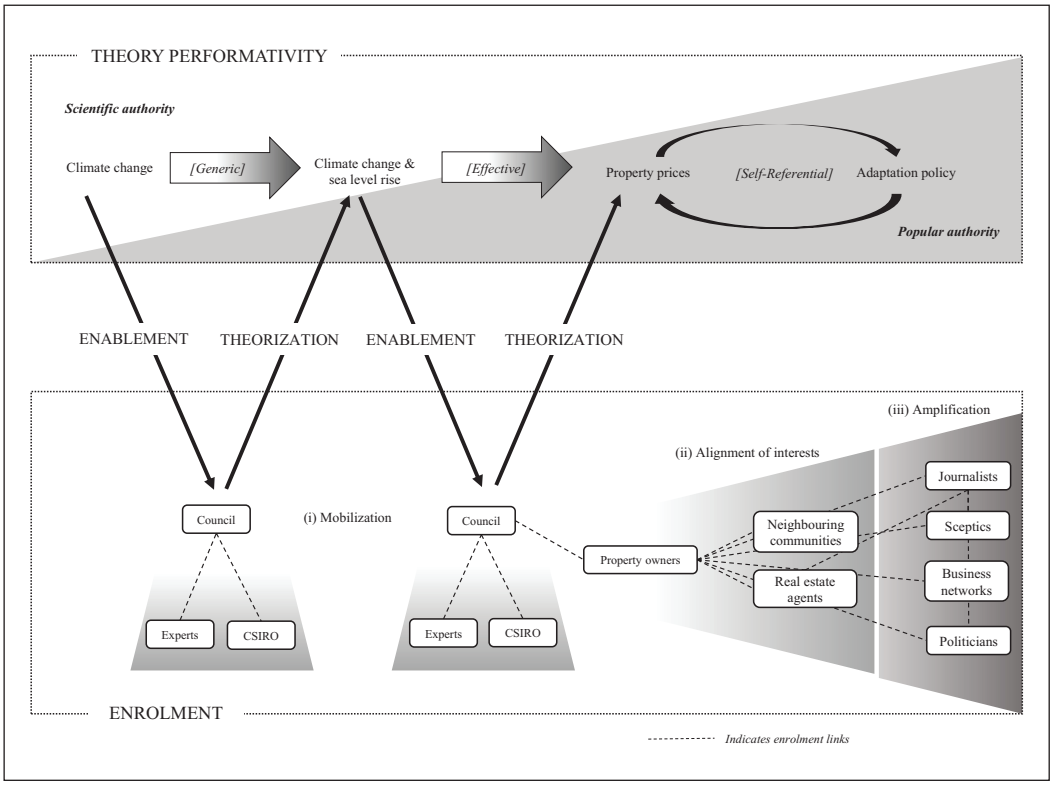

Figure 2. Model of translation.

basis of scientific authority, into a controversy focused on property prices, a theory which was supported by popular authority. In this section, we demonstrate how these shifts follow an identifiable pattern through the translation process which can be used to understand the ways in which actors develop, change and act upon theories while enrolling others in social debates (see Figure 2). Our findings suggest this process was shaped by the two key mechanisms of *enablement* and *theorization*. The materialization of the theory in reports and notifications shaped the circumstances, which enabled certain actors to speak on the matter. These new conditions also allowed these actors to enrol other actors into the debate, and to alter the focus of the discussion in developing or editing the theory. In our case, this theorization resulted in a translation process in which one (popular) theory takes precedence over a prior (science-based) theory as a basis for public policy. This movement has more general implications for the ways in which power and theory are constituted and acted upon in the translation process.

The starting point for the process observed in the case study is the establishment of a science-based theory according to which climate change results in sea level rise. This theory is brought into being through the scientific authority of the IPCC and articulated in its regular assessment reports, which was then applied to the local government area of Lake Macquarie in its initial adaptation policy. In doing so, the council staff were first engaging a *generic performativity* (MacKenzie, 2006) in directly translating the IPCC information to the council's area of responsibility.

The IPCC report enabled the council to focus its planning and development processes towards a concern with future sea level rise. The council staff then acted upon the scientific theory; bringing

it 'into being' (MacKenzie & Millo, 2003) through *effective performativity* by making changes to development policies based on local application. In order to do this, the council staff mobilized further scientific expertise in the form of flooding consultants and made use of localized data from the CSIRO to outline which properties were likely to be affected. This enrolment produced a new theorization – that climate change related sea level rise was likely to have localized impacts on properties. By incorporating international data into the local, the resultant report and policies involved an effective performativity (MacKenzie, 2006); whereby the theory (of future climate change impacts) affected the ways in which property developments were approved. Thus, the theory became incorporated into practice.

Having an adaptation policy in place, the council staff then sought to mobilize those residents affected as a means of reaching consensus over practical responses. This was carried out by notifying property owners and inviting them to be involved and represented in future plans. However, the enrolled property owners participated in ways which altered the basis of authority. That is, their participation *enabled* them to mobilize others with aligned interests as well as powerful community members who were willing to amplify these concerns. This enablement occurred through both the process of being notified and invited to respond to the policy, as well as being identified as individuals within the community who were most impacted by the policy.

The translation of climate change into the local community shows the ways in which the initial authority – presumed to result from expertise – was eroded. As the basis of authority was held together only to the extent to which there was agreement between actors, this basis shifted as the power relations expanded to include more actors, who opened up 'their sphere of discretion' to change the terms of debate (Barnes, 1984, p. 193). In the case study, property owners, developers and real estate agents mobilized their own power and developed a new theorization – that property prices were falling because of the adaptation policy. Rather than referring to scientific authority for information on the impacts of the policy, the notion that property prices were dropping was generated within and shared among those in the community, including neighbouring regions. The deployment of an alternative theorization – around concern for property and climate scepticism – was popularized through amplification in the media, by politicians and through business networks. Within the translation process a new theory was produced and the notion that climate change was the centre of concern was outflanked.

Finally, the concern about property prices became *self-referential*; collectively acted upon in favouring a 'wait and see' approach in the final adaptation plan upon which the community and council agreed. Rather than acting on climate change concerns, consensus was found in the production of an adaptation plan which delayed any practical response and committed the council to protect property values. Moreover, the need for this became accepted as fact – following Barnes (1983, p. 538) – it became a 'self-fulfilling prophecy. . . a feedback loop' which gained popular authority. The new theory was acted upon and legitimized by the acceptance of its authority, which was aligned with the interests of property owners and developers. The need to protect property prices, by becoming self-referential, trumped science-based concerns about climate change impacts, through a subtle performativity struggle nurtured by pre-existing power dynamics.

Discussion

Investigating a controversy surrounding the process through which theory was translated, we identified two key mechanisms – enablement and theorization – which explain the relationship between theory performativity and power, and in so doing allows us to trace the shift from scientific to popular authority. Our findings also assist in explaining why we are failing to address climate change, as we show how, through 'performativity struggles' (Callon, 2007), vested interests can

seed doubt about climate change and find alternative explanations for events (McCright & Dunlap, 2010). This has practical implications for climate change adaptation plans. We discuss each of these contributions in turn.

Theory performativity within translation

Our first contribution expands on recent developments in the literature on theory performativity (Callon, 2017; Carton, 2020; Martí & Gond, 2018). Following the translation process of climate science into a local controversy allows us to unpack the constitution of power as it shapes theory performativity. By showing how the mechanisms of enrolment, enablement and theorization interact within the process of translation (see Figure 2), our empirical findings illustrate that power is more than just a 'boundary condition' of theory performativity (Martí & Gond, 2018), or an unintended 'effect' of strategy processes (Kornberger & Clegg, 2011). Rather, in our model power is central to the process by which a theory is translated within and across settings.

Mirroring the sociotechnical claim that 'to adopt is to adapt' (Akrich, Callon, & Latour, 2002 [1988], p. 208), we found when it comes to theory 'to perform is to transform'. Our take on theory performativity therefore builds on Martí and Gond's (2018) model of performativity and addresses the critique of d'Adderio et al. (2019) that there has been a tendency to assume 'theory stability'. In contrast, we have provided empirical evidence that theory can be transformed or challenged during the translation process. In addition, the mechanisms of enablement and theorization highlight that performativity and power dynamics are necessarily entangled, and that theory performativity requires the continuous work of interest alignment – theory performativity is, in essence, a political process. We suggest that these mechanisms could be useful in unpacking the power dynamics in other empirical arenas as a means of further understanding 'performativity as politics' (Nyberg & Wright, 2016).

Performativity and power struggles over authority

Our second contribution focuses on the ways in which power is mobilized in practice by particular actors, at particular moments, to influence a theory. In emphasizing this, we enrich prior research by explaining how the authority of science becomes challenged by a more localized popular authority. While earlier work has revealed how different expert bodies of knowledge compete within an organization leading to compromise (d'Adderio & Pollock 2014; Callon, 2007), or how authority is reproduced through socio-material conditions (Bourgoin et al., 2019), our analysis shows the struggle to be authoritative can occur across organizational settings, and through local theory translation, performativity struggles can lead to the outflanking of science-based theories.

Thus our analysis emphasizes power as being 'materially relational' (Gond & Nyberg, 2017, p. 1134) and shows how resourceful actors deliberately weakened a theory by mobilizing actors disputing the science and identifying a shared interest in prioritizing property values in the community. These actors created a narrative which suggested that discussing the impacts of climate change would have a negative effect on property prices. In this way, those in the community who were opposed to the adaptation plans moved past the 'direct confrontation' of speaking about climate change by building their own theory in relation to property values and eroding the authority of climate science. Our results thus complement d'Adderio and Pollock's (2014) insights by highlighting how competing forms of authority are ultimately subject to power relations which can undermine science-based theories. Such struggles are indicated more broadly in debates about mitigating climate change, and more recently in national responses to the Covid-19 pandemic, whereby scientific evidence is pitted against more popular understandings of the economy as a

means of arguing against expert advice. Further, our results show that shared interests can also shape the distribution of knowledge in ways that make theories self-referential and thus more difficult to challenge or contest. In this sense, the power relations are constantly re/produced by theory performativity; the theory itself contributes to the outcomes of the process – in this case, the adaptation policy.

Processes of theory performativity

Our third contribution lies in modelling the processes through which theory performativity and power operate within translation. Through the mechanisms of enablement and theorization, we explain the different forms of movement operating within the case study which ultimately transform the theory away from climate change and towards property values. These mechanisms are 'generative' in that they bring to bear the 'activity, flow and interactions evolving over time' (Cloutier & Langley, 2020, p. 6) within the case study.

As a means of 'opening up' space for shifting the theory, enablement emphasizes the ways in which 'socio-material agencement' (Callon, 2017) in the form of IPCC reports, flood risk plans, property notifications and meetings enabled actors to engage in the local political dynamics. Initiated at first through scientific authority, enablement provided these actors with capacity and legitimacy to speak, which they employed to enrol other actors in the process. In line with classic translation theory (Callon, 1986), the actors had the capacity to enrol others by mobilizing representation, aligning interests and amplifying a theory through broader networks.

In addition, the theorization process reveals important power dynamics which we have emphasized here in order to further explain the translation process. While theorization has been used in the context of institutional theory to discuss 'the creation of new or alternate constructs' (Mena & Suddaby, 2016, p. 1671), we use it here as part of a broader process encompassing multiple interactions. Thus, we show how the relationship between enablement and theorization work together to alter existing theory (climate change impacts) towards concern for property values. This process model, then, takes account of the roles of actors, power and theory performativity to show their relationships to each other. While it may be naïve to assume social responses will be in line with scientists' suggestions – for the climate crisis or, indeed others – we have provided a means of tracing how powerful actors are able to capitalize on their positions, engage others in the process, and ultimately undermine even the most informed policy responses.

Conclusion

Our study should function as a call to all who are concerned about climate change to increase their engagement with the development of policies and actions seeking to alleviate its worst impacts. Against the backdrop of worsening climate change projections (IPCC, 2018) and a procession of ever more extreme weather events, political responses to the growing climate crisis remain ineffectual. While organizational scholars have focused on the role of corporate political activity (Nyberg et al., 2013) and professional identities (Lefsrud & Meyer, 2012) in the maintenance of climate denial, our focus on theory performativity extends this analysis, particularly in highlighting the processes through which popular theories are given prominence in the partisan policy debate over climate change response. Our research shows the importance of understanding the translation of climate science at the local level (Latour, 2018). The main aspect of resistance in Lake Macquarie was not the denial of climate science, but rather engaging with an alternative theory and re-ordering social reality. Adopting a performative understanding of power as the capacity to shape collective beliefs can help explain how actors constantly maintain the production of

self-validating 'fake news' through social media channels that resist and delay the drastic changes needed to avert the catastrophes identified by scientific expertise – be this health, environmental, or other emergencies.

Beyond climate change, our study can be applied more broadly to the discussions around what is seen as an era of 'alternative facts' and 'post-truth' politics (Knight & Tsoukas, 2019). While despair at the outcomes of this phenomenon have led some to accuse postmodernist thinking of encouraging widespread relativism (Foroughi, Gabriel, & Fotaki, 2019), our study also cautions against reactionary attempts at seeking a singular truth. In this we echo Latour (2018), and argue that if anything, our current political situations highlight the importance of continuing to question the production of knowledge and assertions of truth. By understanding the means by which different theories are given authority in the translation process, there is a stronger potential to expose the production and reproduction of 'fake news' for the purpose of maintaining power. This not only assists in understanding the authority of dominant theories, but also the power dynamics that prevent us from acting upon them. Strengthening and making more transparent the scientific production of knowledge is arguably more effective than truth assertion, especially when theory can be replaced. Without this scrutiny, there is little doubt that climate inaction, and the obfuscation of knowledge production with 'alternative facts' in favour of economic priorities, will continue.

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