

Institutional governance barriers for the development and implementation of climate adaptation strategies

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Abstract

In this paper we summarise the main social barriers to adaptation presented in climate literature – the inherent uncertainty of climate change, fragmentation, institutional voids, short term horizon of politicians and policies, and the motives and willingness to start adapting. We have linked these topics to theories in public administration to explore if there is interesting overlap that could be beneficial for our understanding of institutional governance barriers for developing and implementing adaptation strategies. We conclude that there are strong interdependencies between what has been signalled in adaptation literature as barriers to adaptation and what has been theorised in public administration literature. However, barriers in the development of adaptation have been hardly discussed in climate adaptation literature. Therefore we argue that in order to understand factors that stagnate the development and implementation of adaptation policy strategies, existing theories of public administration could prove very valuable.

Keywords; *barriers; adaptation strategies; institutions; governance;*

1. Introduction

Throughout the world, vulnerable regions and societies are starting to develop adaptation strategies to manage the projected impacts of anthropogenic climate change (Swart *et al.*, 2009). Adapting to something in the distant future is daunting and many barriers can prevent the development and implementation of adaptations from taking place (Adger *et al.*, 2007). During the last couple of years there has been an increasing scientific interest to the question if we, as a society, already have started to adapt to the unavoidable impacts of climate change and, where this is not the case, explore those limiting factors in more detail (Adger, 1999; Adger *et al.*, 2007; Moser, 2009b). Numerous case studies throughout the world have analysed what these societal factors are, or can be, with the aim to improve future effectiveness in developing and implementing adaptation strategies (Adger, Lorenzoni *et al.*, 2009). Most of these studies have focused on the socio-economic preconditions to enhance adaptive capacity for effective adaptations (Adger, 2003; Smit and Wandel, 2006). However, before adaptations are implemented they go through processes of decision making in which barriers can occur that constrain the adaptation strategy from being developed and implemented.

With the increasing scientific attention to climate change from different epistemic communities, more theories and perspectives are becoming available to address the social factors in relation to policy processes – including theories from political science, public administration, psychology and organizational studies. These theories have already contributed to the discussions on climate change in the past (Demeritt, 2001; Rayner and Malone, 1998), and more recently focused on limits and barriers in climate adaptation processes (Adger, Lorenzoni *et al.*, 2009). For example, Adger *et al.* (2009) – drawing from insights from history, sociology economics and political sciences – conclude that all social limits to adaptation are changeable if the diverse and contested values are addressed properly and within their specific context. Moser *et al.* (2008) discuss factors that determine adaptive capacities, opportunities and constraints of policy makers in the adaptation process in the Northeast United States, and Swim *et al.* (2009) discuss the psychological factors in responses of individual and collective actors to changing climate.

Many of these studies presented barriers that are inherent to any complex or wicked environmental policy problem. Other studies focus on the unique characteristics of climate adaptation and the complexity it provides to decision making, including issues like decision making under uncertain circumstances, involvement of multiple actors and levels in policy processes, division of responsibilities and conflicting time horizons (Adger, 2003; Adger *et al.*, 2005; Dessai and Hulme, 2004; Hulme, 2009; Urwin and Jordan, 2008). In many occasions the conclusion is that these issues can pose major barriers to the development and implementation of adaptation strategies but how, and to what extend, is not often part of the analysis. In order to explain why certain adaptation strategies strand in decision making processes, theories from public administration sciences could be very useful and can help scholars to understand the causes for stagnating policy processes. These theories could add new dimensions and insights to the discussions about social barriers to adaptation and the development and implementation of 'effective' adaptation strategies. The objective of the paper is therefore to identify the main social barriers that are mentioned in the climate adaptation literature for the development and implementation of climate adaptation strategies. We will link these with theories of public administration and reflect on the linkages with climate adaptation.

The first section of the paper will explain the conceptual underpinnings and will give the scientific perspectives from which the paper has been written. The following sections will focus on the main barriers found in climate adaptation literature. Section three will describe the inherent uncertainty that decision makers have to cope with and relate this to the uncertainties in the decision making processes. The next session will discuss fragmentation across scales, actors and sectors. Section five and six will address the institutional void in climate adaptation and short term horizon of politicians and policies, respectively. The last section will address the missing motives to start developing adaptation practices. The paper will end with some reflections and conclusions.

2. Conceptual foundations

The Intergovernmental Panel on Climate Change (IPCC, AR4-WG2) defines adaptation to climate change as '...adjustments to reduce vulnerability or enhance resilience in response to observed or expected changes in climate and associated extreme weather events' (Adger *et al.*, 2007: 720). We refer to adaptation strategies as the anticipatory responses and planned actions in the human and natural system to manage the projected impacts of climate change, reduce vulnerability or enhance adaptive capacity (Adger *et al.*, 2007; EEA, 2008; Isoard *et al.*, 2008; Smit and Wandel, 2006). New and innovative adaptation strategies are needed since many traditional adaptations to natural variability and change are likely not sufficient to cope with the unavoidable impacts and changes caused by anthropogenic climate change.

Adapting to climate change is a wicked, complex and messy policy problem where traditional ways of acting no longer suffice – climate change cuts across traditional boundaries, existing institutional structures and routines, policy arena's and networks, and jurisdictions (Lorenzoni, Jones *et al.*, 2007; Termeer and Kessener, 2007; Thynne, 2008; Verweij *et al.*, 2006; Weber, 2008). Adapting to these changes requires collective action since no actor alone can solve the problem themselves. It forces them to interact within networks and policy arenas to negotiate with other actors about problems and solutions. In contrast to the traditional policy cycle

perceptive, we start from the observation that contemporary decision making is highly dynamic and complex, taking place through several rounds of decision making in which dependent actors continuously negotiate through series of repetitive interactions about problems and solutions, strategies and objectives, formal and informal rules (Scharpf, 1997). Within this governance perspective on decision making, stagnations and breakthroughs occur that influence and steer the outcome of policy games (Koppenjan and Klijn, 2004). We assume that decision making is not only about taking decisions, but also to purposefully prevent taking decisions.

Institutional governance barriers

In this paper we are particular interested in those factors that pose barriers to the development and implementation of adaptation strategies. Some of these barriers are material and can be major limits in decision making, such as technological limits (Adger *et al.*, 2007). Other barriers are caused by social factors. These social barriers can be explained as the outcome of the interactions of intentional actors but, as Scharpf (1997, 1) argues, ‘...that these interactions are structured, and the outcomes shaped, by the characteristics of the institutional setting in which they occur’. Taking this actor-centred institutional perspective, we subdivide, for purely analytical purposes, the social barriers in to actor specific and institutional barriers – see figure 1¹.

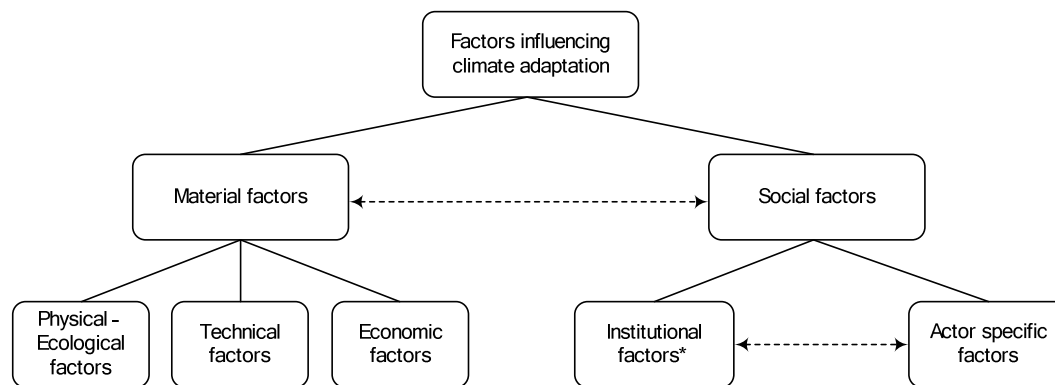


Figure 1 – categorisation of variables influencing policy processes on climate change adaptation

Actor specific barriers are those factors that prevent the actor from deploying their strategies and achieving their goals in the policy game. Institutions can be barriers when they constrain actors in achieving or pursuing their goals. For example if someone does not want to include adaptation in their daily practices because he or she does not experience climate change as a threat, we refer to an actor specific barrier. If existing regulation prevents an actor to include adaptation in their daily practices, we refer to institutional barriers. Here, institutions are referred to as the structuring and more enduring features in social life that are persistent through time and difficult to change. They are contrived of prevailing formal and informal rules, shared norms and values, and common held beliefs about certain issues (Scott, 2008). Institutional governance barriers therefore refer to those barriers in policy processes that stagnate policy processes, which are beyond the capabilities of individuals to break through and need collective action to change them.

Our current conceptions about barriers to adaptation seem to float high in the air of abstract thought, unconnected with details about each individual case. It is not always clear what actors experience as a barrier to adaptation – things one actor might experience as a barrier to adaptation, to could be an opportunity to other actors, or in another context, to achieve goals. Barriers, therefore, is a multifarious description of a pressure or counter pressure that represses individuals in achieving personal and collective goals – the development and implementation of adaptation strategies.

¹ In the reminder, of this paper when we refer to barriers, we mean social barriers to adaptation

Social barriers to adaptation in climate adaptation literature

Literature on climate adaptation refers to many social barriers to adaptation but not all of them are unique to climate change – many are inherently linked to complex decision making processes (Adger, Lorenzoni *et al.*, 2009). Since we are particularly interested in the long standing controversies that are described as barriers in developing and implementing adaptation strategies, we selected uncertainty, fragmentation, institutional void, conflicting time horizons, and missing motives and willingness to start adapting as institutional barriers for the analysis.

3. Strategic uncertainty

Central to almost any discussion on developing and implementing adaptation strategies is the notion of uncertainty.

Climate change literature on uncertainty

Several scholars have argued that the development and implementation of adaptation strategies depends on the level of certainty of projected climate impacts and vulnerabilities (Adger, Dessai *et al.*, 2009; Füssel, 2007). Despite the broad scientific consensus that the climate is changing and that this is very likely caused by human attribution, many uncertainties remain on how climate change will affect society (Dessai *et al.*, 2009a; Hulme, 2009; IPCC, 2007). The uncertainties have become ‘cruel dilemmas’ for decision makers (Jasanoff, 2007) and they can pose significant barriers in the development and implementation of climate adaptation strategies (Dessai and Hulme, 2004). Uncertainty in the context of climate change refers to the lack of certain knowledge about current states and future events. Our understanding of, for example, the rate and magnitude of climate change and the persistence and irreversibility of projected changes is still seen as uncertain. The limited and incomplete knowledge of the climate system is what can be referred to as epistemic uncertainty – many complex relationships and dependencies between the climate system and other land-, oceanic-, and atmospheric processes and their feedback mechanisms are still unexplored or not fully understood (Dessai *et al.*, 2009a). Some processes that influence future events are unknowable, for example, how the natural system will respond to changes – natural stochastic uncertainty – and the human behaviour to influence that system – human reflexive uncertainty (Dessai *et al.*, 2009b).

When different types and levels of uncertainty are combined, for example in assessing the distribution of vulnerabilities and impacts across regions and population groups or defining the most effective adaptations, the uncertainties accumulate, creating an even wider range of uncertainties decision makers have to deal with (Adger and Vincent, 2005; Dessai *et al.*, 2009b). Traditional responses suggested in the literature to deal with these uncertainties are to diminish epistemic uncertainty by conducting more research, to increase computational power, to communicate the range of uncertainty to decision makers through probabilistic scenarios, and to quantify degrees of (un)certainties. The development of effective adaptation strategies is often hampered by misunderstandings about the uncertainty that is paramount in contemporary science. As Sarewitz (Sarewitz, 2004) argues, uncertainty about environmental issues is not only about lack of scientific understanding, but also about missing coherence between scientific understandings and the political, cultural and institutional context in which a policy process takes place. As result, recent discussions about robust and flexible adaptation strategies emerged as a direction in which different pathways can be selected to prevent maladaptation and, as time progresses and understanding of climate change increases, the adaptation strategy will be adaptable to different decision paths that suit the socio-political developments.

Public administration literature

Any process of decision making is about achieving something in the future. Certainty is never an attainable state in decision making, as uncertainty is an inherent attribute of any prospect. Koppenjan and Klijn (2004) in their book *Managing uncertainties in networks* define three types of uncertainty that can lead to stagnations in policy processes: substantive uncertainty, strategic uncertainty and institutional uncertainty. Substantive uncertainty refers to the complex nature of policy problems like climate change and the availability, accessibility and quality of

information about the problem. This information is used as input into decision making processes to understand the problem and to design solutions. However, some processes are unknowable, some information can be missing, is not accessible, counterintuitive or there is doubt about the legitimacy, credibility and salience of the information (Cash *et al.*, 2003). Substantive uncertainty leads to contested perceptions on the causes and effects of climate change and which adaptation strategies are best to pursue. This information is interpreted differently by actors, depending on their frame of reference. In cases where actors do not reflect on their understandings of a problem and its solutions, cognitive impasses or fixations in the process can occur. Complex policy problems like climate change include large numbers of actors, each with their own norms, beliefs, values, worldviews and interpretations of reality. They often have different objectives, goals, interests and expectations about the outcomes of policy games. Strategic uncertainty refers to the uncertainty which strategies actors are going to use to reach their goals. Actors in policy games are often not aware of the strategic and goal orientated behaviour of other actors and the resources they have to achieve these goals. Institutional uncertainty refers to the processes of decision making that take place at several policy arenas at the same time and at different levels of governance. The institutions – prevailing formal and informal rules, norms and values – vary between contexts and are highly fragmented, leading to conflicting institutional structures and divergent responses of actors to institutional pressures.

Comparison and reflection

Most of the scientific literature on climate change adaptation focuses on the uncertainty of projected impacts of climate change and how to communicate the scientific uncertainty to decision makers. Authors argue that scientific uncertainty limits the development and implementation of adaptation strategies and refer to the complexity of 'decision making under uncertainty'. However, little attention is paid if and how uncertainty actually limits the development and implementation of adaptation strategies. Several recent surveys and interviews among adaptation policy entrepreneurs have illustrated that uncertainty about the rate and progress of climate change is not perceived as a significant barrier to adaptation (Lorenzoni, Nicholson-Cole *et al.*, 2007; Moser and Tribbia, 2006; Simonsson *et al.*, 2010). This is also suggested by Adger *et al.* (2009) who propose that '...adaptation need not be limited by uncertain knowledge on future climate change'. Public administration literature refers to this type of uncertainty as "substantive", which is one of several forms of uncertainty that can stagnate policy processes. Decision making depends not only on the mathematical calculations of uncertainty, uncertain knowledge or irreducible ignorance, but also about the uncertainties caused by the strategies of actors and institutions involved in decision making processes. Not in all instances is decision making under uncertainty a barrier. Only in some instances and from some perspectives, uncertainty about climate change can be used to prevent decision making. In order to understand how 'uncertainty' poses a barrier in the development and implementation of effective adaptation strategies, we need to include strategic and institutional uncertainty in the policy assessments.

4. Fragmentation

Fragmentation is expected to be a main barrier to development and implementation of adaptation strategies. Fragmentation refers to the large number of different actors involved in coping with climate change at different levels of governance.

Climate adaptation literature on fragmentation

In climate adaptation literature the interpretation of fragmentation refers to the many actors and levels involved and widely dispersed material and human resources. The interlinking scales have been part of discussions on effective and robust adaptation strategies. In the past, scientists and policy makers framed climate change as being global, something which is not supported by recent experiences of adaptation activities that operate at a range of spatial and societal scales (Adger, 2001; Adger *et al.*, 2005; Hulme, 2008b; Lynch *et al.*, 2008). Policy makers around the world have now recognised the necessity of integrating adaptive thinking in relevant areas of public policy making across different levels of governance (Urwin and Jordan, 2008). The combination of

horizontal and vertical interplay within and between scales and the combination of top down and bottom up approaches to achieve 'effective adaptation' has become central to any scale discussion on adaptation policy (Adger, 2003; Adger *et al.*, 2005; Dessai and Hulme, 2004). At each level, actors in different constellations with varying perceptions, strategies and objectives are involved in the decision making processes. The process of multi-level governance has become challenging for policy makers – to combine, in time and space, the hierarchically and centrally governed political structures on one hand, with on the other hand the aims and objectives in local contexts, social capital, values and norms about what is desirable and socially acceptable (Adger, Lorenzoni *et al.*, 2009). Many of these processes are incoherent and difficult to congregate into decision making.

Not only actors and scales, but also resources are often fragmented in adaptation policy processes. Resources can be subdivided in material aspects – financial, technological, physical – and social aspects – legal/legislative, knowledge/ information, time. Not all resources are distributed equally throughout regions. Their accessibility is of particular importance in the context of adaptation. For example, tacit and explicit knowledge on the impacts and vulnerabilities to projected climate changes are highly valuable in long term planning for adaptive measures. Even though climate change is probably one of the most researched environmental issues of the last decade, much of this information is highly dispersed, context specific or difficult to access. Some attempts have been made to gather information, for example the UNFCCC local coping strategies database, the proposed EU clearing house mechanism and the UKCIP case studies database. Still, much of the information is fragmented within and between actors, organisations and different administrative levels (Swart *et al.*, 2009). Financial resources are mentioned in many studies on adaptive practices to be the main barrier/hindrance to successful adaptation. In their survey amongst researchers from different case studies in the Alp region, the EEA (2009) found that access to economic resources and financial incentives was one of the more influential factors in adaptation to climate change and water resource issues. The availability and accessibility of both material and social resources is relevant as Moser and Tribbia (2006) found when they asked coastal zone managers in California to rank suggested barriers for including climate change adaptation in their daily practices. They found that resources, in terms of time, money, and human capacity, were mentioned the biggest hurdles. Similar results were found by Simonsson *et al.*, (2010) in the Swedish context. Particularly in countries where material resources are scarce, practitioners experience their availability and accessibility as major barriers in implementing adaptation strategies (Bryan *et al.*, 2009). The social resources are often mentioned as a barrier in the development of adaptation strategies whilst material resources are limits in the implementation of adaptation strategies.

Public administration literature on fragmentation

Alongside the multilevel governance aspects, public administration literature on fragmentation refers to the different ways of governing, fragmented responsibilities and fragmented decision making processes. Complex policy problems that include multiple levels and actors, types of policies at various policy arenas and within different policy games are characterised as highly fragmented decision making processes (Koppenjan and Klijn, 2004). Within one policy game, actors can have different worldviews, diverging interests and goals, conflicting identities, autonomies and responsibilities. Policy games about climate change adaptation do not take place in a policy vacuum – multiple games are being played at the same time which influence the outcomes of other games. Fragmentation becomes visible in the decision making and governance arrangements, the increasing self-organising capacity of actors, their independence and specialisation, and the increasing role of private actors in decision making. Within and between governments, different steering arrangements are present, varying from hierarchical and top down orchestrated forms of governing to heterarchical network governance relations where dynamic structures govern the actions of actors in social systems across time and space (Koppenjan and Klijn, 2004; Rhodes, 2007; Teisman, 2000). Fragmentation in steering mechanisms can lead to intractable conflicts and stagnating policy processes. Multiplicity also refers to the prevailing rules, normative assumptions and values and beliefs that differ between actors in policy games. In most occasions there is lack of coordination and absence of rules. Hence, different forms of fragmentation in contemporary decision making processes make steering and decision making difficult.

Reference is often made to 'loosely coupled systems' of decision making in which actors consciously or unconsciously influence each other through decisions taken in other policy arenas. Causal linkages between policy games are often unpredictable and ill understood. Individuals have a high autonomy relative to the larger decision making system that they are operating in. Actors can purposefully couple policy games as strategy to achieve their goals – or if they feel threatened by other games, decouple games.

Comparison and reflection

The climate adaptation literature refers not directly to fragmentation. However, many of the issues found in literature that might hinder the development and implementation of adaptation strategies can be labelled as fragmentation. Fragmentation is inherent to any complex policy process. In order to understand fragmented decision making processes on adaptation, we need a better understanding of what constitutes couplings in decision making and how they relate to one another.

5. Institutional void

In the relatively new policy domain of climate change adaptation, there are few commonly accepted rules and norms according to which policy processes are taking place. Public administration and policy sciences literature refers to this as an 'institutional void' and can be a major hindrance for the legitimacy and efficacy of policy processes (Hajer, 2003).

Climate change literature

Even though the concept of 'institutional void' is not commonly used in climate adaptation literature, many of the institutional factors that are mentioned as barriers to adaptation result from the absence of climate adaptation institutions (Håkon Inderberg and Ove Eikeland, 2009). In many countries there are no formal institutions, rules and laws on climate adaptation (Swart *et al.*, 2009). The climate literature refers to a whole list of barriers to adaptation strategies which are caused by the absence of formal rules. As argued by some scholars, there are no coercive mechanisms that enforce policy makers to develop and implement long term climate risk assessments, vulnerability studies or adaptation strategies, or to include or mainstream adaptation in climate sensitive policy domains (Füssel, 2007). Developing or implementing adaptive policy strategies without formal incentives or pressures to encourage actors to adapt is challenging, especially when adaptation is not structurally supported by governments and is placed randomly in the hands of individual actors. When there are no rules or norms about what is generally accepted and valued as being 'effective adaptation', mechanisms to weight the effectiveness of adaptive practices and prevent maladaptation from taking place becomes unattainable. There are no formal arrangements to finance the development and implementation of adaptations and safeguard investments over longer periods of time, even though short term investments prove to be cost effective (Bouwer and Aerts, 2006; Stern, 2006). There is no clear division of who decides, who is responsible, who are the relative winners and losers, and who should pay for these practices (Adger, Lorenzoni *et al.*, 2009; O'Brien *et al.*, 2006; Thynne, 2008). Moreover, formal planning and management tools that consider climate change adaptation are still missing as a result of the institutional void. The lack of formal rules and associated resources and instruments is illustrated by Moser and Tribia (2006) in California, Simonsson and colleagues (2010) in Sweden, the ESPACE project (2007) in the UK and Netherlands, and the EEA for the Alp regions (EEA, 2009). In these specific cases, the lack of rules is seen as a major hindrance to the development and implementation of adaptation strategies. In response to this void, new rules and regulations are being developed within different countries. The UK Climate Change Act for example, introduces an institutional structure with reporting powers to facilitate adaptation across governmental scales (Mortimer, 2008; Swart *et al.*, 2009). Often neglected but equally important are the informal rules, shared norms, values and beliefs about what effective climate adaptation entails (Adger, 2003; Adger *et al.*, 2005). For example, there are no rules and norms in place that correct free rider behaviour. Particularly in climate change adaptation individuals benefit from the efforts of each member and all can benefit substantially from collective action. Although free riding behaviour is often characterised as morally wrong, in the absence of normative standards correcting them becomes complicated.

Public administration literature

Solutions for new and pressing policy problems such as climate change are often found outside the traditional institutional arrangements. New policy problems are emerging parallel to the existing institutional order and need to claim their position in a world already filled with institutions – within prevailing formal and informal rules, norms and values (Hajer, 2003). Institutional void therefore does not mean that there are no institutions in place, but rather that there are no institutions that address the issue in particular. In situations where there are no specific institutions in place, decision making without the proper authority or normative assumptions about the problem is challenging, particularly for the legitimacy and efficacy of collective decisions. Decisions are therefore balanced by the frame of reference of actors, who are influenced by the existing institutional arrangements. Many of the policy decisions, therefore, align with traditional governance arrangements and existing ways of doing to justify the course of action. Policy making in an institutional void includes what Hajer (2003) refers to as ‘double dynamics’. Actors do not only search for favourable solutions for pressing problems, they negotiate at the same time about new rules and about what is perceived as socially acceptable and politically feasible. They create normative assumptions about what entails effective policy and create shared understandings to discern right from wrong. This process of building new institutions is what Zucker (1977) refers to as ‘institutionalisation’. Decision making becomes even more challenging when we assume that the essence of adaptation strategies is mainstreaming adaptation in existing institutional arrangements and climate sensitive policy domains (Kok and de Coninck, 2007). As a result, decisions about adaptation are not taken in an institutional vacuum and have to align to norms and values of existing institutional arrangements. Adaptation, therefore, does not only operate in an institutional void, it also pursues institutional change to include rules, norms and values about adaptation in existing social structures.

Comparison and reflection

Many factors in the literature that describe the difficulties of adapting to climate change are reducible to the newness of the policy issue and the institutional void in which adaptation currently take place. The main focus in the adaptation literature is on the missing formal arrangements, tools and instruments to develop and implement adaptation strategies. Suggestions are made to fill the void with new institutional structures – including regulations, instruments, organisations and mechanisms – and first efforts are already made. In line with discussions in the public administration literature, an increasing amount of attention is directed towards shared norms and values about problems and solutions, common understandings of concepts, and moral grounds upon which these actions are taken.

Particularly in the climate literature, an institutional void is often positioned as a bad thing. Other literature, however, suggests that these voids are spaces of opportunity where innovations and experiments are not hindered by any institutional structures. We argue that many of the current ideas and innovative adaptation strategies are being developed *because* of the institutional void. If institutionalisation develops too fast, it might limit variety for future policy options. At the same time, institutionalisation is a necessity: when the political momentum on climate change will diminish and new governments with other agendas will be in place, the institutional structures safeguard the continuation of the development and implementation of adaptation strategies.

6. Short time horizon of policies and politicians

Another characteristic of climate change that is being referred to as a barrier to decision making is the incongruence between long term processes of climate change and the short time horizon of politicians and policies.

Long term climate change

The inertia of the climate system causes long time lags between the actual cause of climate change – human attributions to the emissions of greenhouse gas – and the totality of consequences. Even if mitigative actions are successfully implemented today, many of the adaptive actions need to continue well into the future. Many of the current climate models project mean temperature changes until 2100 or even beyond. Because of the potential

magnitude of societal changes, the impact and vulnerability assessments follow similar time lines. Adaptive strategies are, therefore, developed for long term changes, but need to be implemented in the short term.

Short term political horizon

The time horizon of many politicians is significantly shorter. In representative democracies the score for politicians is settled when the four or five year term of office draws to an end. Politicians are aware that there is a correlation between their performance during the term of office and their chances of being re-elected, as is argued by amongst others Compston (2009). What is on their agenda is influenced by pressing issues, public opinion and topics covert in media (Weingart et al., 2000). This includes popular topics like climate change, sustainable development and energy efficiency. However, many politicians focus on societal issues which are deemed more pressing, for which solutions can be implemented within their terms of office, and for which they receive immediate credits, such as pandemic diseases and financial and economic crises. The credits for anticipatory adaptation to long term changes, however, are difficult to identify and only become visible in the future. Whereas there are clear short term gains from mitigative practices and energy efficiency – for example reduced energy bills – the gains in anticipatory adaptation are much more difficult to relate to short-term mindsets and daily practices of most individuals and businesses. Climate adaptation demands short term efforts and investments in something which is taking place in the distant future. Persuading vulnerable population groups and regions to start adapting is therefore challenging, even though anticipatory adaptations are likely to be more effective and cost efficient if taken earlier rather than later.

To keep the illusion of political actions, instead of taking decisions on proactive adaptation, politicians pose *statements* about what should be done in the long run. They use cover up strategies (Termeer, 2009) – new research programmes and commissions on the state of the art on climate change, references to the uncertainty on return of investments, suggestions to wait for new climate scenarios, and dates for future adaptation strategies – to prevent taking decisions that are perceived unfavourable, implemented outside their term of office or politically damaging.

Short term policies

Governments, as agents of collective action, have a role in steering individuals and business towards a sustainable and adapted society. Policies – referring to deliberate governmental plans of action to guide decisions about future issues – often do not include long term challenges of climate change. Traditional planning horizons often do not extend 50 years in to the future, because well before then, society has already changed and more or other issues need political attention. Many policy strategies are, therefore, revised every 5-10 years to match the dynamics within society and to use our better understanding of the pressing issues. Because adaptations are linked to these dynamics, adaptations generally do not travel well in time and space. What is said to be necessary today day might not be in the future. Most policy domains have not yet included climate adaptation in their policies, for which many reasons exist including scepticisms about climate change, ignorance about personal vulnerability, seeing climate change as a distant threat, externalisation of responsibility and blame. Bureaucratic processes such as rounds of consultation and revision procedures are also reasons why climate change is not yet incorporated in climate sensitive policy domains.

Comparison and reflection

There is probably no other pressing environmental issue in which the time span between the occurrence of the problem and the need to implement solutions is as large as is the case in climate adaptation. Short term measures are needed to prevent disastrous future events. This incongruence in time complicates decision making processes particularly because our contemporary governance arrangements and policy strategies are not sufficiently equipped to deal with these huge time lags. Revision of the governance arrangements and policy strategies are therefore necessary. There has been plenty of literature on the short-termism of politicians and their role in decision making processes. However, the motives of some politicians are not only focused on short term gains. Some are motivated and willing to start discussions about developing and implementing adaptation strategies.

7. Missing motives and willingness to start adapting

Adapting to climate change is largely a cognitive, attitudinal and behavioural challenge of individual and societal change (Hulme *et al.*, 2009; Lorenzoni and Hulme, 2009; Lorenzoni, Nicholson-Cole *et al.*, 2007; Lorenzoni and Pidgeon, 2006; Oppenheimer and Todorov, 2006; Semenza *et al.*, 2008; Swim *et al.*, 2009). However, when motives to start adapting are missing they can pose great barriers in the development and implementation of adaptation strategies at all levels of governance. Until now, little attention has been paid to the role of motives in the context of adaptation policy making, even though it has been mentioned as a major barrier to adaptation policies (Tompkins *et al.*, 2009). Literature on climate change refers to two archetypes of motivational factors; the actor specific motives - intrinsic motives - and the institutional motives - external motives - to start adapting (Lorenzoni, Nicholson-Cole *et al.*, 2007; Swim *et al.*, 2009).

The motivation of each individual to respond to climate impacts is inherent to the rewards of the task, including recognition, idealism, exercise of will, tranquillity, and curiosity. The intrinsic motivation is the personal gain of an individual without external inducement (Swim *et al.*, 2009). It could for example be basic self interest – self preservation, autonomy and growth – that motivates actors (Scharpf, 1997). However, these factors are not climate specific and can be related to any policy issue. Other more specific factors are found by Lorenzoni *et al.*, (2007) who argue that individual factors such as lack of understanding, uncertainty and scepticism about climate change, perceiving climate change as distant threat, missing sense of urgency, fatalism, reluctance to change lifestyles, and externalising responsibility and blame are important barriers to individual action. If policy makers feel disempowerment and despair or no sense of urgency and disbelief about future changes, the motives to start adapting will be low. Bazerman (2006) concludes that decision-makers generally overweigh vivid events. He argues that positive illusions (unrealistic optimism and false sense of control), egocentrism, omission bias (adverse consequences of actions), status quo (people do not want to give up what they already have), and overtly discounting the future are important reasons why we do not act to the ‘predictable surprise’ of climate change (Bazerman, 2006). If individuals have compelling intrinsically motivated reasons and arguments not to act, they balance them to the potential individual rewards. When the rewards are substantially lower, it is not likely that adaptation strategies are developed. These can be the motivational factors not to engage in climate adaptation.

Institutions can motivate actors to start adapting, even though actors might not be intrinsically motivated. External motivation is the result of other actors’ tangible rewards or pressures to achieve a certain goal, such as financial gains and coercive instruments. One example could be the legal reporting powers of national governments for climate risk assessment and adaptation strategies by local authorities. In literature, the main external motivational factor to start adapting to climate change is undoubtedly the occurrence of extreme events and the societal impacts as a result of these events (Pielke Jr and Sarewitz, 2005; Whitmarsh, 2008). Examples include the droughts, heat waves, and floodings of the last decade in Europe which created political and social attention to the changing climate and sense of urgency to adapt (among some). Motives are more difficult to identify when the threats of climate change are less prone (Lonsdale and McEvoy, 2009). Actors, organisations and businesses whose objectives and strategies are significantly threatened by the impacts of climate change are likely to be motivated to take proactive adaptation measures. The same would be the case for individual actors of which climate change will affect their daily routines and practices. Following a similar line of argumentation, motives to adapt can also result from a cross-over with other drivers such as future socio-economic development scenarios and the resulting vulnerabilities (Lonsdale and McEvoy, 2009). Actors can also be motivated by ‘champions’ that have a strong intrinsic emotional and intellectual connection to climate change to see and grasp opportunities and take on constraints and barriers. Climate change champions play a crucial role in motivating others – enthusiasm, belief, empowerment – in their adaptive responses and are seen as a precondition for effective adaptation at micro levels (ESPACE, 2005).

Comparison and reflection

There is little understanding what motivates and what discourages actors, politicians and policy makers to start adaptive practices. Public administration literature makes little reference to these processes. Research in the context of climate change focuses primarily on what motivates people in terms of mitigative practices. What has become clear though is that motives and willingness of actors to act are essential in developing and implementing adaptation strategies. Better understanding of actor specific motives to start with adaptation enables us to develop stimulating mechanisms and instruments for adaptation. Existing institutional and governance arrangements could be changed to stimulate actors to start adaptation.

8. Reflection and conclusions

Regardless of the complexity in society, regardless of the multifaceted pressures and demands, counter pressures and counter demands which make up dynamic decision making processes, we as society need to start developing adaptation strategies to anticipate future climate change. This paper has shown that mainstream adaptation literature refers to topical issues like uncertainty, scale, responsibility, social capital, time horizon and willingness as factors that present major barriers for policy makers to develop and implement climate adaptation strategies. There is however little (theoretical) understanding how these factors actually limit decision making processes and public administration theories could prove useful to support understanding these barriers. The public administration literature often confirms the existence of these barriers and complements them with theoretical explanations. The public administration literature also makes clear which barriers are common in all change processes, and which ones are more significant for the problem of climate change. What has become clear though is that climate adaptation literature primarily relates to barriers in the implementation of adaptation strategies rather than in developing them. They focus primarily on resources – time, money, capital, knowledge – as preconditions for successful and effective adaptation. Barriers for the development of adaptation strategies – such as strategic and institutional uncertainty – are hardly addressed in climate literature. Moreover, many other barriers can be explained not only by one factor, but the combination of different factors. For example, Adger (2009) refers to unclear division of responsibility as barrier to decision making. Is this caused by uncertainty (who is responsible), fragmentation (who is responsible for what and where), or institutional void (what is responsibility)? In this paper, we have started by identifying barriers mentioned in climate literature, but it would be interesting to see if theories from public administration science about other wicked and complex policy issues could add new dimensions to the discussions about climate adaptation and decision making.

There have also been some topics that we have not touched-upon in this paper. There is for example little understanding about the processes that take place in the ‘darkness of backroom policymaking’, including politics of climate adaptation, hidden transcripts and the role of power games, even though they are essential features of decision making (Compston, 2009; Giddens, 2009). In addition, it would be interesting to analyse how politicians and policy makers frame current discourses of climate change and how this framing influences their responses in terms of developing adaptation strategies. Hulme argues that the current dominant discourse on anthropogenic climate change can be labelled as ‘climate as catastrophe’ because of the scientific prospective futures of global warming (Hulme, 2008a). Framing climate as catastrophe, however, can lead to demoralisation and fatalism among policy makers and within society (Hulme, 2008a, 2009; Lorenzoni and Hulme, 2009; Lorenzoni, Nicholson-Cole *et al.*, 2007; Moser, 2009a). Fear of climate change, as argued by Hulme (2008a), is arguably not the best approach to motivate policy makers to act – rather discourses that lead to awareness and motivates to collective action is desirable.

What policy makers experience as most important barrier to adaptation is likely to change in the course of time. The issues addressed in this paper – uncertainty, fragmentation, institutional voids, short term horizon of politicians and policies, and the motives and willingness to start adapting – are discussed in scholarly literature and it would be interesting to see if these match the practical experiences of policy actors – politicians, policy makers, policy entrepreneurs, and decision makers – in the field of climate change adaptation. Several studies that include interviews and surveys with actors give a glimpse about what they perceive to be the most important barrier to adaptation. Here too the emphasis is on implementing adaptation strategies, see for example Moser and Tribbia (2006), Simonsson *et al* (2010), Bryan *et al.*, (2009), and Lonsdale *et al.*, (2009).

We conclude this paper by arguing that much can be learned about the barriers in developing adaptation strategies by looking at theories in public administration. Better understanding of the barriers (and opportunities) in decision making, their underlying mechanisms and strategies to break through them could facilitate new and innovative adaptation strategies in current and future policy processes.

References

- Adger, W. N. (1999). Social vulnerability to climate change and extremes in coastal Vietnam. *World Development*, 27(2), 249-269.
- Adger, W. N. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development*, 13(7), 921-931.
- Adger, W. N. (2003). Social capital, collective action, and adaptation to climate change. *Economic Geography*, 79(4), 387-404.
- Adger, W. N., Agrawala, S., Mirza, M. M. Q., Conde, C., O'Brien, K., Pulhin, J., et al. (2007). Assessment of adaptation practices, options, constraints and capacity. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. In M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden & C. E. Hanson (Eds.), *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 717-743). Cambridge, UK: Cambridge University Press.
- Adger, W. N., Arnell, N. W., and Tompkins, E. L. (2005). Successful adaptation to climate change across scales. *Global Environmental Change*, 15(2), 77-86.
- Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., et al. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, 93, 335-354.
- Adger, W. N., Lorenzoni, I., and O'Brien, K. (Eds.). (2009). *Adapting to Climate Change: Thresholds, Values and Governance*. Cambridge: Cambridge University Press.
- Adger, W. N., and Vincent, K. (2005). Uncertainty in adaptive capacity. *Comptes Rendus - Geoscience*, 337(4), 399-410.
- Bazerman, M. H. (2006). Climate change as a predictable surprise. *Climatic Change*, 77(1-2), 179-193.
- Bouwer, L. M., and Aerts, J. C. J. H. (2006). Financing climate change adaptation. *Disasters*, 30(1), 49-63.
- Bryan, E., Deressa, T. T., Gbetibouo, G. A., and Ringler, C. (2009). Adaptation to climate change in Ethiopia and South Africa: options and constraints. *Environmental Science & Policy, Corrected Proof*.
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., et al. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America*, 100(14), 8086-8091.
- Compston, H. (2009). *The politics of climate policy: strategic options for national governments*. Paper presented at the 5th ECPR General Conference.
- Demeritt, D. (2001). The construction of global warming and the politics of science. *Annals of the Association of American Geographers*, 91(2), 307-337.
- Dessai, S., and Hulme, M. (2004). Does climate adaptation policy need probabilities? *Climate Policy*, 4(2), 107-128.
- Dessai, S., Hulme, M., Lempert, R., and Pielke Jr, R. (2009a). Climate prediction: a limit to adaptation? In N. W. Adger, I. Lorenzoni & K. L. O'Brien (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance* (pp. 64-78). Cambridge: Cambridge University Press.
- Dessai, S., Hulme, M., Lempert, R., and Pielke Jr, R. (2009b). Do we need better predictions to adapt to a changing climate? *EOS*, 90(13), 111-112.
- EEA. (2008). *Impacts of Europe's changing climate - 2008 indicator-based assessment* (No. 4/2008). Copenhagen: European Environmental Agency.
- EEA. (2009). *Regional climate change and adaptation. The Alps facing the challenge of changing water resources*. Copenhagen: European Environment Agency.
- ESPACE. (2005). *How can local authorities stimulate & support behavioural change in response to climate change? A report for Hampshire County Council undertaken as part of the ESPACE project September 2004 – May 2005*: Alexander, Ballard & Associates with Rosslyn Research Ltd.
- ESPACE. (2007). *What policies present barriers to adaptation in the UK and the Netherlands?* Southwell: Acclimatise.
- Füssel, H. M. (2007). Adaptation planning for climate change: Concepts, assessment approaches, and key lessons. *Sustainability Science*, 2(2), 265-275.

- Giddens, A. (2009). *The politics of climate change*: Polity.
- Hajer, M. (2003). Policy without polity? Policy analysis and the institutional void. *Policy Sciences*, 36(2), 175-195.
- Håkon Inderberg, T., and Ove Eikeland, P. (2009). Limits to adaptation: analysing institutional constraints. In N. W. Adger, I. Lorenzoni & K. L. O'Brien (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance* (pp. 433-447). Cambridge: Cambridge University Press.
- Hulme, M. (2008a). The conquering of climate: Discourses of fear and their dissolution. *Geographical Journal*, 174(1), 5-16.
- Hulme, M. (2008b). Geographical work at the boundaries of climate change. *Transactions of the Institute of British Geographers*, 33(1), 5-11.
- Hulme, M. (2009). *Why we disagree about climate change: Understanding Controversy, Inaction and Opportunity*. Cambridge: Cambridge University Press.
- Hulme, M., Dessai, S., Lorenzoni, I., and Nelson, D. R. (2009). Unstable climates: Exploring the statistical and social constructions of 'normal' climate. *Geoforum*, 40(2), 197-206.
- IPCC (Ed.). (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Cambridge, UK: Cambridge University Press.
- Isoard, S., Grothmann, T., and Zebisch, M. (2008). *Climate Change Impacts, Vulnerability and Adaptation: Theory and Concepts*. Paper presented at the Workshop 'Climate Change Impacts and Adaptation in the European Alps: Focus Water'.
- Jasanoff, S. (2007). Technologies of humility. *Nature*, 450(7166), 33-33.
- Kok, M. T. J., and de Coninck, H. C. (2007). Widening the scope of policies to address climate change: directions for mainstreaming. *Environmental Science and Policy*, 10(7-8), 587-599.
- Koppenjan, J. F. M., and Klijn, E. H. (2004). *Managing uncertainties in networks: a network approach to problem solving and decision making*. New York: Routledge.
- Lonsdale, K., and McEvoy, D. (2009). *Policy analysis and adaptive capacity* (Final report): thematic priority 'Global Change and Ecosystems' within the 'Adaptation and Mitigation Strategies: Supporting European Climate Policy' (ADAM) project.
- Lorenzoni, I., and Hulme, M. (2009). Believing is seeing: Laypeople's views of future socio-economic and climate change in England and in Italy. *Public Understanding of Science*, 18(4), 383-400.
- Lorenzoni, I., Jones, M., and Turnpenny, J. R. (2007). Climate change, human genetics, and post-normality in the UK. *Futures*, 39(1), 65-82.
- Lorenzoni, I., Nicholson-Cole, S., and Whitmarsh, L. (2007). Barriers perceived to engaging with climate change among the UK public and their policy implications. *Global Environmental Change*, 17(3-4), 445-459.
- Lorenzoni, I., and Pidgeon, N. F. (2006). Public views on climate change: European and USA perspectives. *Climatic Change*, 77(1-2), 73-95.
- Lynch, A. H., Tryhorn, L., and Ambramson, R. (2008). Working at the boundary: Facilitating interdisciplinarity in climate change adaptation research. *Bulletin of the American Meteorological Society*, 89(2), 169-179.
- Mortimer, R. (2008). *Climate change: UK impacts and adaptation overview of Government policy*. Paper presented at the IET Seminar Digest.
- Moser, S. C. (2009a). *Good Morning, America! The explosive U.S. awakening to the need for adaptation* Santa Cruz, CA, USA: Susanne Moser Research & Consulting in association with the California Energy Commission, National Oceanic and Atmospheric Administration, Coastal Services Center.
- Moser, S. C. (2009b). Whether our levers are long enough and the fulcrum strong? Exploring the soft underbelly of adaptation decisions and actions. In N. W. Adger, I. Lorenzoni & K. L. O'Brien (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance* (pp. 313-334). Cambridge: Cambridge University Press.
- Moser, S. C., Kaspersen, R. E., Yohe, G., and Agyeman, J. (2008). Adaptation to climate change in the Northeast United States: Opportunities, processes, constraints. *Mitigation and Adaptation Strategies for Global Change*, 13(5-6), 643-659.
- Moser, S. C., and Tribbia, J. (2006). Vulnerability to Inundation and Climate Change Impacts in California: Coastal Managers' Attitudes and Perceptions. *Marine Technology Society Journal*, 40, 35-44.
- O'Brien, K., Eriksen, S., Sygna, L., and Naess, L. O. (2006). Questioning complacency: Climate change impacts, vulnerability, and adaptation in Norway. *Ambio*, 35(2), 50-56.
- Oppenheimer, M., and Todorov, A. (2006). Global warming: The psychology of long term risk. *Climatic Change*, 77(1-2), 1-6.

- Pielke Jr, R. A., and Sarewitz, D. (2005). Bringing society back into the climate debate. *Population and Environment*, 26(3), 255-268.
- Rayner, S., and Malone, E. L. (1998). *Human choice and climate change*. Columbus, Ohio: Battelle.
- Rhodes, R. A. W. (2007). Understanding governance: Ten years on. *Organization Studies*, 28(8), 1243-1264.
- Sarewitz, D. (2004). How science makes environmental controversies worse. *Environmental Science & Policy*, 7(5), 385-403.
- Scharpf, F. W. (1997). *Games Real Actors Play: Actor-Centered Institutionalism in Policy Research*. Oxford, UK: Westview Press.
- Scott, W. R. (2008). *Institutions and organisations: Ideas and interests* (3rd ed.). Thousand Oaks, USA: Sage Publications, Inc.
- Semenza, J. C., Hall, D. E., Wilson, D. J., Bontempo, B. D., Sailor, D. J., and George, L. A. (2008). Public Perception of Climate Change. Voluntary Mitigation and Barriers to Behavior Change. *American Journal of Preventive Medicine*, 35(5), 479-487.
- Simonsson, L., Klein, R. J. T., Gerger Swartling, Å., André, K., and Wallgren, O. (2010). Perceptions of risk and limits for climate change adaptation – Case studies of two Swedish urban regions. In: Springer publication.
- Smit, B., and Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3), 282-292.
- Stern, N. (2006). *Stern Review on the Economics of Climate Change*. London: UK Government Economic Service.
- Swart, R. J., Biesbroek, G. R., Binnerup, S., Carter, T. R., Henrichs, T., Loquen, S., et al. (2009). *Europe Adapts to Climate change: Comparing National Adaptation Strategies* (No. 01/2009). Helsinki: Finnish Environment Institute (SYKE).
- Swim, J., Clayton, S., Doherty, T., Gifford, R., Howard, G., Reser, J., et al. (2009). *Psychology and Global Climate Change: Addressing a Multi-faceted Phenomenon and Set of Challenges: A Report by the American Psychological Association's Task Force on the Interface Between Psychology and Global Climate Change*.
- Teisman, G. R. (2000). Models for research into decision-making processes phases, streams and decision-making rounds. *Public Administration*, 78(4), 936-956.
- Termeer, C. J. A. M. (2009). Barriers to new modes of horizontal governance: A sense-making perspective. *Public Management Review*, 11(3), 299-316.
- Termeer, C. J. A. M., and Kessener, B. (2007). Revitalizing stagnated policy processes: Using the configuration approach for research and interventions. *Journal of Applied Behavioral Science*, 43(2), 256-272.
- Thynne, I. (2008). Climate change, governance and environmental services: Institutional perspectives, issues and challenges. *Public Administration and Development*, 28(5), 327-339.
- Tompkins, E. L., Boyd, E., Nicholson-Cole, S. A., Weatherhead, K., Arnell, N. W., and Adger, W. N. (2009). *An Inventory of Adaptation to climate change in the UK: challenges and findings* (Working Paper 135): Tyndall Centre for Climate Change Research.
- Urwin, K., and Jordan, A. (2008). Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. *Global Environmental Change*, 18(1), 180-191.
- Verweij, M., Douglas, M., Ellis, R., Engel, C., Hendriks, F., Lohmann, S., et al. (2006). Clumsy solutions for a complex world: The case of climate change. *Public Administration*, 84(4), 817-843.
- Weber, E. P. (2008). Facing and managing climate change: Assumptions, science, and governance responses. *Political Science*, 60(1), 133-149.
- Weingart, P., Engels, A., and Pansegrau, P. (2000). Risks of communication: Discourses on climate change in science, politics, and the mass media. *Public Understanding of Science*, 9(3), 261-283.
- Whitmarsh, L. (2008). Are flood victims more concerned about climate change than other people? the role of direct experience in risk perception and behavioural response. *Journal of Risk Research*, 11(3), 351-374.
- Zucker, L. G. (1977). The Role of Institutionalization in Cultural Persistence. *American Sociological Review*, 42(5), 726-743.