

**The Micro-foundations of Evidence-Based and Participatory Policy Decision Making in
GMO Food Policy in North America and the European Union**

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DRAFT: Comments Welcome

Introduction

The empirical variation of policy paradigms across jurisdictions and policy sectors has long been of interest to policy scholars examining institutional change. Building on the seminal work of Peter Hall (1993), who demonstrated the influence of exogenous shocks on precipitating paradigm change, researchers have also documented the endogenous process of institutional change driven by policy actors or new ideas through processes of conversion, layering, and drift (Thelen 1999; Hacker 2004). Drawing on empirical evidence of paradigm change in macroeconomic policy, social policy, and democratization (Dobbin, Simmons, and Garrett 2007; Bradford 1999; Hall 1993), scholars have identified a range of causal mechanisms by which shifts in policy ideas can give rise to new institutions, including processes of puzzling, powering and persuasion (Blyth 2007; Blyth 2001; Mandelkern and Shalev 2010). These causal mechanisms trace alternative pathways to paradigm change; while puzzling refers to a process of social learning which policy makers and experts come to develop new shared understandings of policy failure and establish collaborative goals, powering and persuasion refer to a more dynamic or competitive process by which policy entrepreneurs marshal economic, political, and discursive resources to advance preferred policy goals and corresponding solutions (Mandelkern and Shalev 2010). Comparative research on macroeconomic policy paradigms suggests that these different dynamics can operate in tandem, with actors pursuing interactive processes of puzzling and persuasion (Skogstad 2011b).

While institutional scholars have developed a wealth of evidence as to the independent dynamics of puzzling, powering, and persuasion, less is known as to how political actors within different jurisdictions and policy sectors determine when to puzzle and when to power. This paper argues that a potential fruitful avenue of theoretical development is to examine the ontological assumptions regarding individual behaviour and human decision making that underpin different causal mechanisms. This paper develops an analytical framework that links policy paradigms, micro-foundational assumptions of human behaviour, and causal mechanisms of powering, persuading, and puzzling in the policy process, which I illustrate using the case of GMO food policy in North America and the EU. I suggest that existing policy paradigms can facilitate certain modes of rationality by hindering others, perpetuating a feedback effect in which policy actors are more likely to puzzle in certain jurisdictions and persuade in others. The paper develops an analytical framework that proposes that when policy problems are relatively well defined, policy advice is dominated by scientific experts, and in which dominant decision making venues are relatively closed, these meso-level conditions facilitate a micro-foundation of instrumental rationality, encouraging actors to either power or puzzle within the policy process. In contrast, in cases where the policy problem is under-defined, when policy advice relies more heavily on credible experts and/or non-state actors, and when decision making venues incorporate emulative governance structures, these meso level factors align more fully with a micro-foundation of cognitively bounded rationality that facilitates processes of puzzling or persuasion. Alternatively, when policy problems are highly salient and contested, when dominant advisors are members of identity-based coalitions, and when decision making venues rely on argumentative practices of debate, actors are more likely to engage in a non-rational logic of appropriateness that enables mechanisms of powering or persuasion in the policy process.

The paper proceeds in the following manner. Part one outlines key differences in the Canadian and European regulatory paradigms of GMOs with regard to three meso-level conditions: 1) aspects of problem definition, 2) dominant sources of policy advice, and 3)

characteristics of decision making venues. Part two examines the ways in which different regulatory paradigms analytically align with three different micro-foundational models of human behaviour, namely instrumental rationality, cognitively bounded rationality, and non-rational logics of appropriateness. Part three concludes with a discussion of the ways in which different policy paradigms generate alternative conceptions of policy failure, likely encouraging alternative dynamics among mechanisms of puzzling, persuading, and powering.

Part 1: GMO Food Policy and Political Paradigms of Risk Regulation

Comparative policy scholars have documented robust variation in the regulation of genetically modified organisms (GMOs) in North America and the European Union, identifying key differences in policy paradigms across jurisdictions, including dominant policy images, advisors, and policy instruments. In particular, scholars have noted a distinct pattern of policy convergence, with the US and Canada adhering to a “scientific rationality” paradigm on the one hand and member countries of the European Union aligning with a “precautionary political culture of risk regulation” on the other (Skogstad 2011a, 900). Table 1 outlines distinct differences with regard to the processes of problem definition, dominant policy advisors, decision making institutions and policy instruments in the different policy contexts.

Table 1: GMO Regulatory Cultures

	<i>North America</i>	<i>EU</i>
<i>Policy Problem</i>	<ul style="list-style-type: none"> • Maximize innovation and competition for GM products • Minimize human health and environmental risks post-hoc 	<ul style="list-style-type: none"> • Ensure that hazardous technologies are prevented from being incorporated into European food supply and environment through processes of genetic engineering
<i>Policy Advisors</i>	<ul style="list-style-type: none"> • Reliance on scientific (expert) authority and producer voluntary self-regulatory measures to identify and assess potential risks 	<ul style="list-style-type: none"> • Skepticism regarding the efficacy of scientific authority to assess potential risks • Reliance on comitology (committee) system of the EU to assess risk preferences of electorate of EU member states
<i>Decision Making Venues</i>	<ul style="list-style-type: none"> • Limited parliamentary debate • Stakeholder consultation with limited range of interest groups • Minimal public participation 	<ul style="list-style-type: none"> • Extensive use of public participatory forums • Stakeholder consultation representing a broad range of interests

	<i>North America</i>	<i>EU</i>
<i>Policy Instruments</i>	<ul style="list-style-type: none"> • No labeling of GM products • Public release of risk assessments not required • Limited public notification before release of GM products 	<ul style="list-style-type: none"> • Mandatory labeling of GM products • Publication of trials and risk assessments • Public consultation prior to release of GM products

Adapted from Skogstad (2003; 2005; 2011a); Hartley and Skogstad (2005); and Beck, (2005)

North American Regulatory Paradigm

Scholars have noted that GMO food policy is relatively well-structured and clearly defined within the North American context, with little contestation from the general public (Skogstad 2005, 250). Policy officials tend to contextualize GMO regulation within broader themes of trade and economic competition. Skogstad notes “the explicit goal of the US GMO regulatory framework [is] to minimize uncertainties and inefficiencies that can stifle innovation and impair the competitiveness of the US industry” (2005, 250). Private authority and self-regulatory market mechanisms are considered to be the most efficient and effective method of regulating the industry (Skogstad 2005, 251). Estimates of human and environmental health risks are assumed to be incorporated into the process through scientific risk assessments conducted by experts. Decision making is likely to be led primarily by unelected bureaucrats and officials within appropriate agencies (Hartley and Skogstad 2005). GMO products are not labelled, however the federal government provides limited public notification prior to the release of new products.

EU Precautionary Paradigm

In contrast to the positioning of North American food policy within the economic frames of product development, trade, and competition, the current framing of the policy problem within the EU centres on considerations of uncertainty and health and environmental risks. EU officials have constructed the prime GMO policy problem as a response to the potential “dangerous” and “hazardous” consequences of integrating genetically modified organisms into the industrial food supply (Skogstad 2005, 245). The policy process aims not just to minimize negative impacts *post-hoc*, but to also predict and prevent harms to public health and the environment caused by biotechnology *a priori*. Compared the North American case, the scope of the problem is much broader, as the problem issue relates not only to the end GMO product, but also the process by which GMOs are developed. With regard to the characteristics of policy advice, EU regulatory culture has undergone a series of challenges as to the effectiveness, adequacy, and reliability of the Commission’s scientific risk assessment from the general public of member states as well as within national parliamentary systems and the comitology system of the EU (Hartley and Skogstad 2005, 317; Skogstad 2011a; Skogstad 2011c). After the BSE crisis in the mid-1990s, which functioned as a focusing event, and effective transnational advocacy campaigns against US GM imports, the credibility of scientific experts was significantly reduced among the electorates of key EU member states, resulting in a reformulation of the policy process at the Commission to include a greater degree of input from the public (Skogstad 2005, 246). The concerns of the EU member state electorates coalesced around the perception that “the science

that has created the new products and technologies that are the source of manufactured and unforeseen dangers cannot be relied on to protect us from these dangers” (Skogstad 2005, 238). GMO products are subject to mandatory labelling, with public dissemination of risk assessments and extensive public consultation prior to the release of new products.

Part 2: Aligning characteristics of policy paradigms and dominant modes of rationality

This paper argues that the GMO policy paradigms described above present a useful illustrative example of variation in three meso-level conditions: 1) dominant perceptions of policy problems; 2) characteristics of policy advisors and the policy environment, and 3) dominant decision making practices within institutional venues. These differences can be clustered into three ideal types, summarized below in Table 2. I suggest that while the NA case illustrates a type of “evidence-based decision-making,” aspects of the EU case demonstrate two alternative participatory paradigms – one in which the policy problem is under-defined and the other in which the problem is contested. The following section examines the ways in which these conditions align with alternative micro-foundational assumptions regarding human behaviour.

Table 2: Policy Paradigm Characteristics

<i>Paradigm</i>	<i>Policy Problems</i>	<i>Policy Advisors</i>	<i>Decision Making Venues</i>
Evidence-Based	well-defined, fixed by external political factors	<ul style="list-style-type: none"> science is considered to be the best tool to accurately determine risks; key advisors are expert knowledge producers including scientists and economists 	<p>Decision makers rely on efficiency as key criterion to evaluate alternatives, often using cost-benefit analysis.</p> <p>decision making is technocratic, often localized within government agencies.</p>
Participatory - Emulative	under-defined; influenced by attention of politicians to political factors or electorate to current issues	<ul style="list-style-type: none"> lack of information contributes to uncertain knowledge of outcomes; key advisors are credible/legitimate experts 	<p>Decision makers likely to use heuristics to evaluate policies</p> <p>decision making is emulative</p>

<i>Paradigm</i>	<i>Policy Problems</i>	<i>Policy Advisors</i>	<i>Decision Making Venues</i>
Participatory - Argumentative	contested; likely shaped by previous policy legacies	<ul style="list-style-type: none"> • Faced with “unknown unknowns” socially constructed identities shape appropriate alternatives • key advisors are target populations and/or political constituents shaped by policy legacies 	<p>Decision makers likely to incorporate values and morals as evaluative criteria.</p> <p>decision making is argumentative</p>

Evidence-Based Paradigms and Instrumental Rationality

In the North American paradigm described above, the policy problem tends to be well structured and clearly defined. Policy officials rely on expert knowledge and scientific peer review to assess risks, and decisions are made within line agencies through a technocratic process that assesses the costs and benefits of policy alternatives. These aspects form the basis of “evidence-based” decision making styles that have dominated program evaluation and policy analysis in industrialized bureaucratic states (Head 2010; Howlett, Ramesh, and Perl 2009; Fischer 2003). From the perspective of micro-foundational theories of rational decision making, this paradigm implies certain key assumptions about the behaviour of particular actors within the paradigm: 1) that individuals are able to rationally update their preferences; 2) that the decision making environment is comprised of calculable risks, and 3) that individual decision makers are able to accurately weigh costs and benefits in order to maximize their utility. The following examines these assumptions in more detail.

Theories of instrumentally rational decision making propose that the majority of human action is based on individual preferences, which are comprised of humans’ wants and desires – for material and economic wants as well as social and moral benefits (Shepsle and Bonchek 1997). The instrumental model of rationality assumes that preferences are relatively fixed, namely that people “know their minds” (Shepsle and Bonchek 1997, 17). The model also assumes that preferences are complete and transitive, which enables individuals to rank order their preferences, and weigh options against each other. Preferences are informed by an individual’s beliefs, which can be understood as particular assumptions regarding the efficacy of any given instrument in enabling an individual to achieve his/her desires (Elster 1988). The decision making environment in an instrumental model is characterized by conditions of managed uncertainty and risk. While in some cases an individual will be able to assert definitively that the chosen means will result in the preferred ends in the majority of cases, the decision maker will ascertain the probability that the selected instrument will enable her to achieve her desires (Shepsle and Bonchek 1997). Even in conditions of complex uncertainty, actors are assumed to recalibrate their calculations to determine rough probabilities (Shepsle and Bonchek 1997; Simon 1985). Choosing a particular course of action is thus motivated by individual self-interest to achieve one’s wants or desires. The act of decision making is the process of determining the expected utility, or value of each potential choice by estimating both the utility of each option and the probability that an outcome will occur. Rational decision

makers are assumed to maximize their utility by weighing the combined utility and probability of each course of action and selecting the action with the greatest expected utility (Shepsle and Bonchek 1997).

This paper suggests that the micro-level assumption that individual actors within the policy process act have a significant degree of certainty as to their perceived material interests and the decision making environment aligns with the meso-level characteristics of a North American policy paradigm that situates GMO food policy relatively narrowly within economic development and innovation. The paradigm anticipates that the prime motivation of individual actors within the sector is to pursue regulatory instruments that will maximize overall economic returns. If the decision making environment is relatively stable, then policy makers can calculate the probability of positive economic outcomes through a process of estimating calculable risks, along with the help of scientific experts. In order to accurately calculate risks, decision making venues regarding GMO food policy in North American are relatively isolated from public consultation and debate, housed within appropriate line agencies within the public service.

Emulative Paradigms and Cognitively Bounded Rationality

In contrast, the EU GMO case illustrates the ways in which policy problems in particular sectors can often be ambiguous and under-defined (Forester 1984, 26), providing opportunities for actors within the paradigm to engage in deliberative debate and persuasion. Simon (1985) stresses that political decisions are often guided by that which is forefront in the minds of decision makers – and by extension the electorate, stressing “the art of campaign oratory is much more an art of directing attention (to the issues on which the candidate believes himself or herself to have the broadest support) than an art of persuading people to change their minds on issues” (Simon 1985, 302). Scholars have noted that under-defined policy problems can reduce the capacity of policy experts to formulate credible policy options (Boswell 2009), creating opportunities for networks of advocacy organizations (Keck and Sikkink 1998) or citizen associations to provide more substantive inputs into the policy debate (Skogstad 2003). Thus while the NA GMO paradigm emphasizes the substantive knowledge of expert policy advisors, the European paradigm requires a test of experts’ credibility in order to legitimate policy outputs. The more limited reach of scientific expertise creates opportunities for popular and citizen networks to engage more significantly in the process of policy formulation, resulting in more participatory and deliberative practices within the EU Commission (Skogstad 2011c; Sabel and Zeitlin 2010). These characteristics of the European GMO paradigm seem to align more fully with micro-foundational assumptions of cognitively bounded rationality that relax a number of conditions regarding the preferences of the decision maker, the environment, and the mechanism by which individuals weigh decisions, explored in more detail below.

Drawing on findings from behavioural studies in cognitive psychology and behavioural economics, analysts have determined that individuals face significant cognitive limitations in determining and weighing their preferences. Social scientists have demonstrated that discourse and context have a significant influence on peoples’ preferences and beliefs, termed “framing” and “source” effects (Druckman and Lupia 2000; Jones 1999). Cognitive psychologists Tversky and Kahneman (1981) find actors deviate systematically from their preferences depending on how a decision set is framed, particularly with regard to whether they are faced with the prospect of a loss or gain. In a similar vein, Druckman (2001) finds that the perceived credibility of elite

experts can influence the shape of people's beliefs (1061). These scholars suggest that changes to the decision making environment can have a significant effect on the ways in which actors come to understand their preferences, opening up opportunities for persuasion to occur. Cognitively bounded theories of rationality stress two key aspects of uncertainty that dominate the decision making environment. First, individuals are plagued by "lack of knowledge of the attributes that characterize the problem" (Jones 1999, 308), resulting from incomplete or partial information (Simon 1985). Individuals are also likely to be constrained by scarce resources, particularly with regard to the time available to settle on a preferred means (Forester 1984; Simon 1985). Second, in some cases, both the means and the ends of a particular choice set may be undefined or uncertain, resulting in ambiguous end states and inevitably ambiguous preferences, as individuals are unable to accurately calculate probabilities based on their preferred desires (Jones 1999; Schmidt 2008).

The influence of framing and source effects on preferences and the uncertainty of the decision making environment often leads individuals to "satisfice" rather than "optimize" (Simon 1985). Rather than searching for the most effective means to a desired end, Simon argues, individuals are more likely to settle on the first option that satisfies their preferences. Simon summarizes: "the search is incomplete, often inadequate, based on uncertain information and partial ignorance, and usually terminated with the discovery of satisfactory, not optimal, courses of action" (1985, 295). The process of incomplete searching is compounded by humans' cognitive limitations. Building on Simon's work, cognitive psychologists have demonstrated that "bottleneck" problems of attention or "on-line" mechanisms of working memory can limit the degree to which humans are able to evaluate multiple alternatives (Druckman and Lupia 2000; Taber 2003).

The above micro-level assumptions regarding potential failures of cognition align with meso-level characteristics of the EU case. In the context of an under-defined, and yet highly salient policy problem, advocates were able to call the credibility of scientific experts into question, prompting policy officials to adopt a precautionary approach to regulating GMO food products. The EU case demonstrates the ways in which increased political debate and the salience of the issue among the public of European member states shifted the attention of policy makers. Drawing on a micro-foundation of cognitively bounded rationality, policy scholars Jones and Baumgartner (2005; 2012) argue that the punctuated nature of policy change over time is determined by organizational shifts in attention. Policy makers initially ignore signals from the environment regarding the salience of an alternative policy problem until the intensity of policy advice crosses a threshold, encouraging policy makers to "over-correct" and attend to the new issue (Jones and Baumgartner 2012). In this context, the European paradigm of GMO regulation aligns with an emulative style of policy decision making that relies more on heuristics and attention.

Argumentative Paradigms and the Logic of Appropriateness

While some meso-level characteristics of the EU case seem to align with a micro-level foundation of cognitively bounded rationality, other aspects suggest an alternative analysis. The development of the EU paradigm can be considered an extensive process of problem construction, as different actors within the Commission, the European Council and the Parliament have struggled to align policy problems with their political and social identities –

including environmentalist, farmer, urban consumer, politician, scientist, and member state citizen. Policy scholars note that in cases where identities are conflicting, problem construction may be more divisive and volatile, with actors polarized into single-issue groups (Sabatier and Weible 2007; Stone 1988). These authors suggest that policy narratives function iteratively over time and across multiple policy sectors to construct specific group identities, which are particularly important under the conditions of uncertainty that characterize much of modern policy making (Skocpol 1995; Schneider and Ingram 1993; Mettler and Soss 2004). In his discussion of world risk society, Ulrich Beck argues that the current conditions of modernity have fostered an “international system [that] is inherently *unpredictable* ... We lack the help of probability calculations for such unknown unknowns” (Beck 2005, 24). The outcomes of a policy decision are not simply uncertain, Beck suggests, but are inherently unknown, beyond the capabilities of the decision maker. The incalculable effects of these unknown unknowns serve to undermine the credibility and validity of scientific and expert knowledge, a shift which raises the significance of socially constructed identities in the policy making process (Mettler and Soss 2004; Patashnik 2003). This approach suggests that EU electorates prefer precautionary policy instruments because they align with certain values that inform policy makers’ cultural identities.

The focus within the EU paradigm on identities and values aligns with micro-foundational models developed by sociological-institutionalist scholars (March and Olsen 1996; Powell and DiMaggio 1991) who suggest that in some instances individuals’ decisions are more likely to be guided by “logics of appropriateness” than “logics of consequence.” March and Olsen (1996) argue that individuals’ preferences are shaped primarily by “rules derived from socially constructed identities.” While rational models characterize preferences as stemming from individuals’ desires shaped by fundamental needs, a logic of appropriateness stresses the degree to which “sentiments of love, loyalty, devotion, respect, friendship, as well as hate, anger, fear, envy, and guilt are made appropriate to particular identities in particular situations” (March and Olsen 1996, 249). A micro-foundation of appropriateness suggests people are driven by a guiding principle of what is considered socially legitimate according to their institutionally proscribed identities.

According to the logic of appropriateness, the decision making environment is shaped by “uncertainties about the demands of identity” (March and Olsen 1996, 251). Unlike instrumental rationality which characterizes preferences as exogenous to the environment, the “logic of appropriateness” implies an endogenous effect in which people’s identities inform their decisions and their identities are “created and shaped within that history” (259). Similar to cognitively bounded rationality, this model highlights the influence of the environment on peoples’ preferences, but expands the scope of influence. While cognitively bounded models might consider the effect of a particular frame on an actor’s specific preference, the logic of appropriateness stresses the effect of social and institutional histories, noting that “[historical] accounts form the basis for defining situations within which identities are relevant” (March and Olsen 1996, 259). In this sense, history shapes the frames, rules, and norms that guide individuals’ decisions in a path dependent manner, reinforcing the legitimacy of some actions while minimizing or discouraging others. A micro-foundation of appropriateness assumes that individual decision making is the act of weighing which course of action is most likely to align with an individual’s identity. Just as in a rational model individuals weigh the likelihood that a particular means will result in their preferred ends, under a logic of appropriateness people draw on their knowledge of a situation and evaluate according to the “consistency and clarity” of their identities (March and Olsen 1996). While a cognitively bounded actor is constrained by

incomplete information and his or her cognitive limitations, an individual acting under the logic of appropriateness is limited by his or her resources to assess the situation and the degree to which institutional rules clearly define the requirements of his or her identity.

The micro-level assumptions of appropriateness resonate with the EU case. Beck (2005) argues that the EU GMO policy context is a prime example of an ‘unknown unknowns,’ demonstrating high degrees of uncertainty and incalculable probabilities (28). As examined above, conditions of uncertainty increase the relative salience of group identities, solidifying pre-existing preferences and notions of what is appropriate, moral, rule-abiding behavior. Beck (2005) stresses that differences in risk perception can be entrenched and codified into diametrically opposed risk communities (33). Hartley and Skogstad’s analysis of the UK case seems to provide empirical support for this possibility, finding that “the public debate revealed a fragmented UK public, in which considerable ambivalence regarding GM technology co-existed with outright opposition” (320). In the face of firmly entrenched, competing constructions of identity, deliberative policy practices may actually serve to exacerbate differences, fostering argumentative debate instead of mediating across group identities.

This paper argues that the variation in meso-level characteristics of different policy paradigms aligns with alternative micro-foundations. Table 3 summarizes the ways in which micro-foundational models rely on different assumptions regarding individual preference formation, the decision making environment, and individual mechanisms of decision making.

Table 3: Micro-foundations of Individual Behaviour

<i>Model</i>	<i>Preferences</i>	<i>Environment</i>	<i>Decision-Making Process</i>
<i>Instrumental Rationality</i>	Preferences based on individual wants and desires; preferences are fixed, transitive, complete; exogenous to the environment	Conditions of managed uncertainty or risk	Utility maximizing; decision makers weigh utility of each instrument and probability the instrument will result in desired ends
<i>Cognitively bounded rationality</i>	Preferences change based on new information, shaped by previous experiences and earlier preferences	Conditions of uncertainty and ambiguity; framing and source effects influence ordering of individuals’ preferences	Satisficing or Emulation; decision makers settle on first alternative that meets baseline criteria; searching is often incomplete, based on partial information, inadequately evaluated because of cognitive limitations and time constraints

<i>Non-rational “logic of appropriateness”</i>	Preferences shaped by socially constructed identities	Conditions of uncertainty with regard to the demands of identity; what is appropriate is shaped by institutional context and historical accounts	Rule following; decision makers use rules to calculate which course of action most appropriately aligns with and supports their identity
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Microfoundations and Powering, Puzzling, and Persuasion

This paper puts forward an analytical approach that examines the alignment between certain meso-level characteristics of policy paradigms, including problem definition, the characteristics of dominant policy advisors, and the prime mode of decision making within institutional venues, and micro-level assumptions of individual behaviour. I suggest that while the NA GMO policy paradigm likely encourages or facilitates instrumentally rational behaviour among actors within the policy process, the EU GMO paradigm seems to align with either a cognitively bounded micro-foundation or a non-rational logic of appropriateness, depending on which meso-level factors or dimensions are at play. The final section of the paper examines the ways in which the alignment between meso-level paradigms and micro-level assumptions likely encourages different conceptions of policy failure and alternative dynamics of powering, puzzling, and persuasion in the policy process.

Puzzling, Powering, and Instrumental Rationality

If the North American GMO regulatory paradigm demonstrates a well-defined policy problem, and if policy actors are perceived to face little to no cognitive or practical constraints as they formulate policy options, then policy failure likely hinges on the degree to which environmental and health risks are accurately calculated. Skogstad (2005) notes that the North American regulatory framework rests on the belief that risk assessment is most effective if carried out voluntarily by producers, under the assumption that it is in producers’ rational self-interest to minimize potential commercial crises (250). Skogstad stresses that US negotiators have demonstrated a strong preference for food and safety measures that are reliant on scientific criteria and scientific evidence. The NA policy process delineates between “technical, non-political” risk assessment and political “risk management” (Skogstad 2001, 302). Risk assessment calculates risks based on the “toxicity of the agent and the predicted exposure to that agent” while risk management sets the “appropriate level of protection and adopting measures appropriate to that level of protection” (Skogstad 2001, 302). I would suggest that the concentration of the NA paradigm on technical calculations of non-political risks likely tends to encourage processes of puzzling focused on first and second order policy change. If individuals know their preferences, which are translated into well-defined policy goals; and if policy advice is provided by experts who have engaged in a full scan of all potential alternatives; then the likely weak points in the process are in assessing the probability distributions of risk and in ensuring that selected policy instruments are legitimate in the eyes of the electorate. Within this context, actors attempting to bring about policy change are likely to engage in mechanisms of puzzling by reinforcing the scientific basis of risk assessment and peer review in the policy

process (Skogstad 2005, 250). If incorporated at all, deliberative, participatory practices are likely to result in a form of powering, or what Hartley and Skogstad (2005) characterize as functional democracy, as key stakeholders – namely agri-food producers – provide input as to the appropriate criteria and measures for determining an acceptable level of protection against risk (314). Within North American GMO policy venues, the most dynamic element of the policy process is the calculation of risk – primarily at the stage of policy formulation – reducing possibilities for policy makers to be persuaded of the efficacy of alternative policy instruments or the legitimacy of different problem constructions; as a result, opportunities for persuasion are more limited.

Persuading, Puzzling and Cognitively Bounded Rationality

From the vantage point of cognitively bounded rationality, GMO policy failure in the European Union has stemmed from the limits of human cognition, the ambiguous scope of the problem and concerns regarding the lack of credibility of scientific expert opinion. Given these determinants policy failure, EU participatory institutions have helped to bolster the credibility of information, fostering a process of puzzling by which policy actors were able to develop a shared consensus on the framing of the policy problem, an institutional response which has also had benefits in EU social policy (Taber 2003; Tömmel and Verdun 2009). Hartley and Skogstad (2005) note that processes of allowing “divergent views and values to be articulated and clarified ... may promote the learning and facilitate the compromises that are needed in order for state actors to manage societal conflict” (308). While the EU institutions likely provide opportunities for incremental puzzling, conditions of cognitively-bounded rationality also have the potential to encourage mechanisms of persuasion. If policy makers are as susceptible to environmental signals as Baumgartner and Jones suggest, then participatory institutional practices likely provide increased opportunities for external actors to introduce new frames and images into the policy process, persuading decision makers that particular courses of action are in their interests, and shifting government attention to new problem constructions and alternative policy instruments (Jones and Baumgartner 2012). The dynamic nature of the policy making environment, and in particular the attention-shifting function of different policy images and frames, likely limits the potential for actors to simply power through the policy process. Policy makers’ cognitive biases, the supply of information, and the ambiguous nature of the problem mitigates the ability of actors to discern their material interests, making powering less feasible. The EU paradigm thus provides actors with opportunities to both puzzle and persuade in order to develop a shared consensus regarding policy goals, increasing the perceived legitimacy of government action.

Powering, Persuading, and Non-rational Logics of Appropriateness

While instrumental rationality anticipates policy failures based on inaccurate calculation of risk and cognitively bounded rationality focuses on the supply or framing of information, the perspective of a micro-foundation of appropriateness anticipates that policy failure stems from the inability of formal institutional rules to broker an adequate consensus between socially constructed groups and identities. The logic of appropriateness predicts that policy clashes will likely centre on morals and values, which act as shorthand indicators for shared identities. From this perspective, repeated calls in the UK case for a public discussion of values (Hartley and Skogstad 2005) can also be understood as the deliberate attempt of policy actors to bring identity

and calculations of appropriateness into the process of policy decision making. The EU practice of adopting precautionary procedures, such as publicizing risk assessments, or engaging in public consultation prior to release of products (Skogstad 2005) reflects an institutionalized attempt to foster ongoing brokerage among different socially constructed groups. Within this context, processes of puzzling which attempt to estimate specific levels of risk are less likely, as scientific information is more likely to be used strategically as a power resource by different issue advocates (Pielke 2007). Drawing on micro theory of the logic of appropriateness, the disparity between NA and EU regulatory cultures reflects different institutionalized identities regarding the perception of risk that have solidified over time (Skogstad 2005; Skogstad 2011a). While the initial break between the EU and NA policy was likely driven by short-term attention of the European public to the BSE crisis – suggesting the dominance of cognitively bounded rationality - over time, shifts in institutional practices – e.g. changes to policy goals, mandatory labeling, reporting of risk assessments, public consultation-- have constructed a new European social identity rooted in notions of a precautionary culture of risk. The degree to which this social identity is firmly entrenched likely informs actors' decisions as to whether to power or persuade; if there is some flexibility with regard to values, actors may be more inclined to persuade each other of the relative appropriateness of a particular policy instrument with regard to specific values. If identities are firmly entrenched however, actors may be more likely to power, pushing for particular policy outcomes based on their social identities and preferences.

Conclusion

This paper engages in a thought experiment to tease out the possible connections between meso-level elements of policy paradigms, micro-level assumptions regarding individual human behaviour, and the causal mechanisms of powering, persuading, and puzzling in North American and EU policy processes. To illustrate the potential linkages between these factors I draw on the case of GMO food policy, arguing that the North American GMO paradigm entails a well-defined policy problem, strong dependence on scientific experts, and a technocratic mode of decision making, meso-level characteristics which correlate with micro-level assumptions of instrumental rationality. I propose that paradigms which foster instrumental rationality are also likely to encourage modes of powering and/or puzzling, as actors either collectively puzzle to develop new policy instruments or power to obtain their preferred policy goal. The analytical framework developed in the paper argues that the European Union GMO paradigm supports two alternative propositions: on the one hand, if the policy problem is ambiguous, policy makers rely on credible experts and policy advocates, and the decision making process are emulative, these meso-level elements align with a micro-foundation of cognitively bounded rationality. On the other hand, if the policy problem is contested, and policy makers rely on the input of broad, identity-based coalitions and the decision making process is more argumentative, these meso level aspects align with a micro-level assumption of appropriateness. I conclude with the proposition that while cognitively bounded rationality promotes mechanisms of puzzling or persuasion, as actors attempt to clarify problem definitions and improve the quality of information, non-rational logics of appropriateness align more fully with dynamics of persuasion or powering, depending on the resilience of actors' institutionally proscribed identities. My discussion of the empirical case of GMO food policy in this paper is illustrative only, leaving the theoretical claims subject to further comparative analysis and testing. Yet the plausibility of the framework suggests the potential for careful analytical approaches to unpack the myriad of

interactions between different conditions that make puzzling, powering, and persuasion possible in some sectors and not in others. By focusing on the nuanced variation in uncertainty, policy problems or images, and institutional legacies, we can begin to chart the ways in which the agency of particular actors is expressed through particular modes of rationality, resulting in alternative policy outcomes across space and time.

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