

Not Whether to Coordinate, But How: Concerns and Mechanism Choice Under a Mandate for Inter-Agency Coordination

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ABSTRACT

A critical question in relation to inter-agency coordination is not only whether, but how, to coordinate. This question is particularly salient when agencies are subject to a top-down mandate. While inter-agency coordination can provide multiple benefits, agencies frequently have concerns about the potential risks of coordination. Differing coordination mechanisms may reduce or exacerbate those concerns. Depending on their coordination concerns, agencies will be inclined to favor certain mechanisms over others. Examination of the implementation of California's Sustainable Groundwater Management Act, which mandates local agency coordination, indicates that coordination mechanism selection is influenced by which combination of concerns agencies hold, with autonomy considerations taking priority over other concerns. These findings suggest opportunities to improve the explanatory power of theories of inter-agency coordination by incorporating potential hierarchies of concerns, their distribution across the multiple agencies tasked with coordinating, and configurational effects. To this end, we propose a contingency theory of agency concerns and coordination mechanism choice under a mandate to coordinate.

INTRODUCTION

The ubiquity of polycentric and/or nested multi-level governance makes inter-agency coordination an essential feature of contemporary policy, law, and administration (Freeman and Rossi 2012; Marks and Hooghe 2004; Peters 2013). Coordination, which refers broadly to processes and practices that aim to synchronize activities across organizations, is needed to reduce the negative effects of redundancies, inconsistencies, and contradictions in laws, policies, and actions (Peters 2013). Coordination can also enhance agency capacity, capture benefits from economies of scale, and mitigate or avoid externalities (Kim et al. 2020; Krause and Hawkins 2021; Watson 2015).

While inter-agency coordination confers multiple benefits (Lindsay et al. 2008; Peters 2013; Watson 2015), it does not always emerge, and where it does, it takes myriad and complex forms. Agencies can strategically employ a variety of mechanisms to coordinate. These mechanisms delineate procedures agencies will use to coordinate, including how decisions will be made and how commitments and responsibilities will be defined, shared, modified, or ended. The mechanisms used to coordinate affect how coordination unfolds, and potentially, its success. Coordination mechanisms can have other consequences as well, including “policy feedbacks” (Moynihan and Soss 2014, 321) that restructure inter-agency power relationships, redistribute resources, and otherwise affect organizational cultures and governance structures (Rodríguez et al. 2007).

Where coordination between agencies does not emerge voluntarily, or to ensure it occurs, higher-level government

officials may seek to steer it (Moseley and James 2008; Saz-Carranza et al. 2016). States may induce local coordination through incentives and information or through mandates with support-and-sanction elements familiar in several federal-state programs (see e.g., Blum et al. 2015; Engel 2015). Some coordination mandates specify how coordination should occur, but most mandates are “vague... leaving implementing agents’ ample space to determine how to coordinate” (Schafer 2016, 25).

Much remains to be understood and explained about inter-agency coordination. There has been progress in identifying the conditions under which agencies voluntarily choose to coordinate, but less (albeit growing) attention to coordination in response to a mandate (Sullivan et al. 2024). Agencies have many concerns about the risks of coordination. These concerns affect whether and how they work together. Current theories explaining coordination do not address the complexities that arise when agencies must balance across concerns about differing types of risk, nor do they address how a mandate influences the risks of coordination.

Our research investigates how agencies’ concerns about the potential risks of coordination affect their selection of the mechanisms they will employ to coordinate under a mandate. We examine inter-agency coordination in implementation of California’s Sustainable Groundwater Management Act (SGMA). SGMA mandates that agencies located within specified groundwater basins coordinate to share knowledge, develop sustainability plans and metrics, and take actions to achieve basin-level groundwater sustainability. In studying local agencies’ actions in response to this mandate,

we identify agencies' coordination concerns and analyze how those concerns combine configurationally to affect their choices of coordination mechanisms. We then use results from this analysis to develop a contingency theory for selection of coordination mechanisms under a mandate and discuss the implications of the contingencies identified for theorizing mandated coordination.

INTER-AGENCY COORDINATION

Inter-agency relationships have been studied under a variety of nomenclatures, including: coordination, collaboration, inter-organizational partnerships, joined-up management, network governance, and contracting, among others (e.g., [Anderson et al. 2014](#); [Bryson et al. 2015](#); [Cejudo and Michel 2017](#); [Kim et al. 2020](#); [Milward and Provan 2003](#); [Peters 1998](#); [Pollitt 2003](#); [Provan and Kenis 2008](#); [Rossignoli and Ricciardi 2015](#); [Shrestha and Feiock 2021](#)). While each term conveys nuances, there is both overlap across them and differences in how they are applied ([Costumato 2021](#); [O'Flynn 2009](#); [Peters 2015](#)). For example, the terms coordination and collaboration are sometimes used as broad categories indicating some form of constructive or mutually beneficial relationship (see e.g., [Bjurström 2019](#); [Bouckaert et al. 2010](#); [Peters 2015](#)), other times as neighboring but distinct points on a spectrum of integration (see e.g., [Bryson et al. 2006](#); [McNamara 2012](#); [Thurmaier and Wood 2016](#)), and other times as phases in a process in which coordination is a prerequisite for collaborative success (see e.g., [Gulati et al. 2012](#)). Collaboration is also sometimes conflated with collaborative governance, which refers specifically to bringing together public and private stakeholders in a forum for joint decision-making ([Ansell and Gash 2008](#)).

We use the term coordination to refer broadly to the processes and practices adopted by agencies to ensure agency goals and activities account for, adjust to, and/or align with those of other agencies (see e.g., [Alexander 1995](#); [Bouckaert, Peters, and Verhoest 2010](#); [Peters 2015](#)). Under this definition, coordination can be pursued through varied forms of relationship (informal to formal) and can entail any depth of integration (from none to outright consolidation).

Mandated coordination occurs when higher levels of government put in place policies that require lower-level governmental agencies to coordinate with one another. In these circumstances, agencies must make decisions regarding the dynamics of inter-agency coordination while also making decisions related to the policy mandate. To explain inter-agency coordination under a mandate, we draw together two strands of policy research. We begin with the implementation literature, which provides broad understandings of how agencies respond to and implement policies. As the implementation literature has not placed much emphasis on inter-agency relationships, to illuminate the dynamic of how agencies make decisions related to coordination, we bring the literature on institutional collective action into conversation with the policy implementation literature.

Implementation of Policy Mandates

The literature on policy implementation is expansive, examining the multitude of processes and factors influencing the translation of policy into action (see e.g., [Hill and Hupe 2002](#); [May 2012](#); [Winter 2006](#)). Due to the breadth and scope

of this literature, it does not contain a singular framework depicting agency responses to a mandate. Nonetheless, several insights from research on policy implementation are especially pertinent to theorizing coordination under a mandate.

Foremost, policies are interpreted by the implementing agencies charged with carrying them out. Implementing agencies must make sense of what is being required of them and envision what enacting the policy will entail ([Hupe and Hill 2016](#); [Spillane et al. 2002](#)). The level of ambiguity within a policy's language will influence how agencies understand and respond to the policy ([Hill and Hupe 2002](#); [Lundin 2007](#)). Interpretations of a mandate are influenced by agencies' perspectives, existing practices, and capacities. As agencies are driven by pursuit of their own interests, they will interpret and respond to a policy in the manner that best serves their objectives, goals, and mission and that minimizes costs and risks ([Schafer 2016](#); [Tummers and Bekkers 2014](#); [Winter 2006](#)).

As a specific form of policy, mandates are directives that lay out specific requirements and generally include some form of sanctioning of agencies for not carrying out the requirements of the mandate. Implementing agencies thus anticipate some risks for not complying with the intents of the issuers of the mandate ([Hill and Hupe 2002](#); [May 1993](#)). These risks of failing to comply with the requirements of a mandate are weighted by the perceived likelihood that a lack of compliance will be detected, that non-compliance will be penalized or otherwise acted upon by the mandating entity, and by the severity of the sanctions for non-compliance ([Hupe and Hill 2016](#); [Lyons and Fowler 2021](#)).

With regard to mandated coordination, the above insights suggest that agencies will respond to a mandate by selecting the forms of coordination that best align with and/or account for their interests. Moreover, agencies will balance their interests with their perceptions about the potential implications for not achieving the requirements of the mandate.

Voluntary Coordination: The Institutional Collective Action Framework

In the absence of a mandate, agencies often work together to achieve shared or complementary goals. Currently, the Institutional Collective Action (hereafter, ICA) Framework is one of the most frequently used frameworks for describing and explaining voluntary coordination that emerges among agencies (see [Kim et al. 2020](#) for a detailed description of the ICA Framework and a review of its application). The ICA Framework depicts inter-agency relationships as resulting from boundedly rational decision-making processes during which agencies weigh the benefits, costs, and risks of coordination. It posits that agencies enter into coordination arrangements when they perceive that the expected benefits outweigh the expected costs.

The situational context (including the problem situation, actor effects, and existing institutions) influences the perceived costs and benefits of inter-agency coordination. Perceived coordination benefits may include the opportunity to share resources; exploit comparative and complementary advantages of each participating agency's strengths; or extend agency services or impacts across a broader population or space. Perceived coordination costs may include loss of resources and the transaction costs associated with making, monitoring, and maintaining agreed-upon coordination activities.

The perceived risks of coordination affect agencies' expectations regarding the benefits and costs of coordination. The ICA Framework considers three types of risks (Kim et al. 2020). *Coordination* risks reflect the potential inability to identify partners and reconcile mutually beneficial opportunities. *Distribution* risks reflect difficulties associated with agreeing on the division of collective benefits and costs among the participating agencies. *Defection* risks reflect the prospect that one or more agencies will not follow through with agreed-upon actions. These three risks reduce the expected benefits of coordination, as they introduce some probability of failure and/or additional transaction costs associated with efforts to reduce the risks.

The ICA Framework posits that, once agencies choose to pursue coordination, the mechanisms they adopt for coordinating are contingent on the risks they are concerned with managing (Kim et al. 2020; Tavares and Feiock 2018; Yi and Cui 2019). Scholars employing the ICA Framework have hypothesized and garnered some empirical evidence suggesting that higher perceived risks lead to the adoption of more formal coordination mechanisms (Hansen et al. 2020; Park et al. 2020; Terman et al. 2020; Yi et al. 2018). However, a review of the extant literature concluded that the attempts to test this relationship empirically have been relatively few and recommended that ICA researchers should more directly examine and test the linkages between coordination concerns and coordination mechanisms (Kim et al. 2020: 11).

Notably, the ICA Framework and research on inter-agency coordination that employ it, have not theorized nor explored empirically the roles of the differing types of risks agencies face when coordinating nor how agencies manage those risks. For example, it may be that some types of coordination risks weigh more heavily in agencies' decisions or that coordination risks interact, serving either to offset or amplify one another. Further, the mechanisms agencies choose to employ for coordinating may serve to preferentially reduce differing types of risks.

Influence of a Mandate on Coordination Risks

Agency decision-making about inter-agency coordination under a mandate likely differs from voluntary coordination. A mandate changes the question from whether to how to coordinate. It makes coordination a requirement; specifies who needs to coordinate; and adds oversight and possible sanctions for not coordinating. These changes mean the risks agencies face under mandated coordination differ from those under voluntary coordination.

Under a mandate, the risk of not finding one or more agencies with which to coordinate for mutual gains (e.g., coordination risk) is removed or greatly dissipated. One's coordination partners are already either identified by the mandate or are reduced to a set of prospective agencies. Further, the need to find shared benefits from coordination is attenuated by the fact that the agencies' collective goals are indicated by the mandate.

Conversely, the risks associated with finding agreement on how to share the benefits and burdens resulting from coordination (e.g., *distribution* risks) and the risks associated with an agency failing to fulfill its agreed obligations (e.g., *defection* risks) are heightened by a mandate. When coordinating voluntarily, agencies have the option of choosing not to coordinate if they view coordination to be inequitable.

Under a mandate, agencies must settle on some allocation of responsibilities, costs, and benefits. Further, defection by one's coordination partner(s) may not only have costs, but may also leave agencies' responsible for fulfilling the defecting partner's obligations related to the mandate (Sullivan et al. 2024).

A mandate also creates two additional coordination risks. Under voluntary coordination, an agency's decision not to coordinate or the failure to achieve the goals of coordination does not result in intervention or penalty from higher levels of government. Yet when mandated to coordinate, agencies face the risk of sanctioning if they do not meet the requirements of the mandate (*compliance* risks). There is the possibility that the agencies will fail to develop coordination arrangements or that, even if agencies do coordinate, the mechanisms they employ to coordinate will be ineffective at achieving operational coordination to the extent required by the mandate.

The other coordination risk that comes acutely into focus in a mandated coordination setting is the loss of agency autonomy (*autonomy* risks). In its conceptualization of voluntary coordination, the ICA Framework characterizes loss of autonomy as a transaction cost associated with the negotiation of the coordination mechanism (Kim et al. 2020, 7). Presumably, boundedly rational agencies would not agree voluntarily to coordination arrangements that entail what they regard as unacceptable autonomy loss. Further, they would only accept reductions in autonomy they view as outweighed by the benefits of coordination. Under a mandate, agencies are required to coordinate, which underscores concerns about the effects of situational variables (power relationships, ideational differences, etc.) and each agency's ability to pursue its core tasks (Bjurström 2019; Bouckaert, Peters, and Verhoest 2010; Schafer 2016). The more specific and detailed the coordination mandate, the greater the risk. At one extreme, a mandate that specifies how and with whom an agency must coordinate encroaches more greatly on agency autonomy. At the other end of the spectrum, a mandate that allots more discretion may provide agencies with more leeway to alleviate their autonomy risks, yet coordination mechanisms may still exercise authority or control that threaten self-determination.

Selection of Coordination Mechanisms under a Mandate

When coordinating voluntarily, or under a mandate that allots discretion, agencies can choose from a multitude of coordination mechanisms (Alexander 1995; Rogers and Whetten 1982). The ICA Framework distinguishes coordination mechanisms based on their degree of authority over participating agencies and whether a mechanism encompasses bi- or multi-lateral relationships (Kim et al. 2020; 19 and 21; Tavares and Feiock 2018). This typology only accounts for some attributes of coordination mechanisms and scholars associated with the ICA Framework acknowledge a need to develop more sophisticated depictions (Kim et al. 2020, 11). Beyond the typology used by the ICA Framework, coordination mechanisms have been categorized based on their depth of integration of decision-making (see e.g., Provan and Kenis 2008) and whether they include concrete targets which each coordinating partner must achieve (Boyne and Chen 2007; Waylen et al. 2015). As these varying categorizations are complementary and not mutually exclusive, we combine them to create a typology that portrays coordination

Table 1. Coordination Mechanism Attributes and Their Influence on Coordination Concerns

Attribute	Options for Each Attribute	Relationship Between Coordination Concerns and Attribute Options
Mechanism authority: The degree of authority of the coordination mechanism.	The coordination mechanism may entail authority that: ■ imposes binding commitments on agencies. ■ makes non-binding recommendations to agencies.	Non-binding decisions or decisions that must be ratified by each agency reduce <i>autonomy</i> concerns by giving each agency final decision-making authority but may increase <i>defection</i> and <i>compliance</i> concerns.
Decision-making: The extent to which agencies make decisions jointly or independently.	The mechanism may structure decision-making to be: ■ fully joint, through shared governance or delegation to a lead agency. ■ limited scope, encompassing only a defined set of joint decisions. ■ deliberative only, with joint discussion yet fully independent decision-making.	Joint decision-making can increase <i>autonomy</i> and <i>distribution</i> concerns while lowering <i>compliance</i> concerns. Constraining the scope of topics for which joint decisions are required may reduce <i>autonomy</i> concerns.
Performance targets: The assignment of agency responsibility for achieving specific outcomes.	The coordination mechanism may: ■ set concrete and quantitative goals for each agency. ■ not set outcome responsibilities for each agency.	Specifying concrete and quantitative responsibilities for each agency reduces <i>distribution</i> and <i>compliance</i> concerns by defining expectations agencies must meet.

mechanisms based on three attributes: mechanism authority, decision-making, and performance targets (Table 1).

Coordination mechanisms can reduce or intensify agency concerns by imposing behavioral controls related to rules and procedures or outcome controls related to expected performance and monitoring (Anderson et al. 2014; Dekker 2004). Each of the three attributes of coordination mechanisms addresses concerns in varying ways. Some attributes simultaneously address more than one concern, as with performance targets alleviating *distribution* and *compliance* concerns. Others reduce one concern while exacerbating another. For example, joint decision-making may reduce concerns regarding *defection* and *compliance* but be seen as negatively affecting *autonomy*. Moreover, some attributes of coordination mechanisms may also be synergistic with one another, thus addressing multiple concerns. For example, *defection* and *compliance* concerns can both be addressed by combining fully joint decision-making with binding authority.

As the attributes of coordination mechanisms may entail tradeoffs between concerns, agencies with multiple concerns will need to decide what to prioritize when their concerns are addressed differentially by a coordination mechanism. Such tradeoffs are especially likely to exist when agencies hold *autonomy* concerns concurrently with other concerns. For example, *autonomy* concerns likely lead agencies to avoid joint decision-making and to protect their self-determination, yet *compliance* concerns likely lead agencies toward joint decision-making. Similarly, *autonomy* concerns likely lead agencies to prefer non-binding authority, but *defection* concerns lead agencies to prefer a binding authority.

While research on voluntary coordination has begun to identify the influences of contextual conditions (e.g., population size, agency capacity, etc.) on selection of coordination partners, on adoption of formal vs. informal mechanisms, and on the complexity of coordinating networks (see e.g., Bel and Fageda 2006; Hulst et al. 2009; Iborra et al. 2018; Krause et al. 2019; Tavares and Feiock 2018), how agencies balance among coordination concerns and why they select specific attributes of coordination mechanisms is poorly understood. Even less is understood about the influence of a mandate on selection of coordination mechanisms. Our research is directed at this gap and specifically, towards determining how

coordination risks combine to influence coordination mechanism selection when mandated to coordinate. We begin by developing and testing four hypotheses about how each of the differing types of coordination risks under a mandate relate to selection of specific attributes of coordination mechanisms. We then analyze how differing sets of concerns combine to influence the full set of attributes of the mechanism selected for coordination.

COORDINATION UNDER CALIFORNIA'S SUSTAINABLE GROUNDWATER MANAGEMENT ACT

Groundwater management provides a useful lens for examining inter-agency coordination because it is an issue for which agencies could achieve mutual gains by coordinating their activities, yet doing so entails risks to agencies. As with many social and environmental issues that span jurisdictional boundaries, the effects of one agency's groundwater management activities can have spillover effects (positive or negative) on other agencies. How those effects are distributed may be uneven, as the geography and hydrogeology of the aquifer in relation to human activities influence where drawdown of water levels, saltwater intrusion, water quality degradation, subsidence, and effects on interconnected surface waters occur and the rate at which those effects spread across the basin. Agencies and the constituents they serve also range in their capacities to respond to groundwater depletion. For example, well depth, access to alternative water supplies, the elasticity of water demands, the speed at which current practices can be changed, and present versus future value of water vary. Agencies may therefore hold disparate views on the causes and consequences of groundwater depletion. They may also disagree about who should be responsible for addressing these issues and the time frame for doing so.

California's Sustainable Groundwater Management Act (See Cal. Water Code §10720-10737) entails a state-level mandate that local-level agencies coordinate to achieve groundwater sustainability. In passing SGMA, state policymakers recognized the potential effects across agency boundaries and required groundwater sustainability be achieved at the basin scale. The law provides local government agencies in a

groundwater basin with new authorities and requires those agencies to coordinate in planning and implementing activities to achieve sustainability. To incentivize agencies in these efforts, the state also provides opportunities for agencies to apply for state funding to support planning as well as implementation. To ensure agencies coordinate in groundwater sustainability planning and implementation, the law grants the State Water Resources Control Board (SWRCB) the ability to intervene should local action not achieve this goal, thus providing the specter of loss of control to motivate local-level action. Should the SWRCB intervene it will charge the local agencies a management fee as well as displacing their authority (CWC §10735.6–8).

Under SGMA, local agencies have substantial discretion in how to comply with this mandate. First, any city, county, public utility or special district government, or combinations thereof, could request designation as a “Groundwater Sustainability Agency” (GSA). GSAs are new legal governmental organizations with responsibility for groundwater management. Multiple GSAs could form in a groundwater basin provided they do not overlap. Second, once designated, GSAs must develop and implement groundwater sustainability plans (GSPs) leading to sustainability within 20 years of plan adoption. GSP development entails determining basin conditions, defining sustainability, and devising an action plan for managing groundwater. Where multiple GSAs formed within a basin, SGMA requires they either work together to develop a single GSP for the entire basin or develop separate but coordinated GSPs that use the same data and methodologies for developing a hydrologic model of the basin, water budgets, and sustainable yield estimates. In basins with multiple GSPs, GSAs must demonstrate how the implementation of their separate plans will satisfy the law’s requirements.

DATA AND METHODS

In 2015, California’s Department of Water Resources (DWR) evaluated groundwater basins across the state, designating 21 of them (figure 1) as “critically over-drafted” thereby determining that “continuation of the present management practices would probably result in significant adverse over-draft related to environmental, social, or economic impacts” (CA Bulletin 118). SGMA required GSAs in critically over-drafted basins to submit GSPs by January 2020, though two of the 21 critically over-drafted basins were exempted. Our research examines coordination in each of the 19 critically over-drafted groundwater basins for which GSAs had to develop GSPs. Across the basins, there were a total of 96 GSAs and 44 GSPs were developed.

A mixed methods approach was used to obtain data on agency concerns and the coordination mechanisms selected for GSA formation and GSP development. We interviewed representatives from 55 GSAs plus 5 consultants who worked closely on GSP development.¹ Interviewees spanned 17 of the 19 basins and 38 of the 44 GSPs produced. Data were also collected through participant observation of more than 55 public meetings (in person, virtually, or reviewing recordings). Additional information was collected from secondary data including meeting minutes, inter-agency agreements, and GSPs.

¹To avoid identifying individual interviewees, we do not list the GSAs and the corresponding number of interviews. Some GSAs are quite small.

These data were coded using the method described in [Supplementary Appendix A1](#) to denote which types of coordination concerns were held by agencies within each basin. Basin-level concerns were identified based on whether (a) the majority of agencies within the basin expressed the concern or (b) one or more agencies explicitly identified a concern as a primary reason for the selection of the coordination mechanism for the basin. While there are intrinsic limitations to measuring and monitoring subjective concerns, when they were present, concerns were manifest across multiple forms of data—interviews, observation, and secondary data. Thus, triangulation across these datasets provides a robust source for coding. For the two basins without formal interviews, informal conversations with state and local officials and consultants confirm those basins are not outliers and corroborate our analysis of observational and secondary data for those basins.

Information on coordination mechanisms adopted for each basin was compiled through analysis of inter-agency agreements and GSPs. [Supplementary Appendix 2](#) describes the data used to identify the coordination mechanisms adopted in each basin and the coding method used to categorize them.

To examine how coordination concerns relate to mechanism choice, we employed configurational analysis methods from qualitative comparative analysis (QCA) ([Rihoux and Ragin 2008](#)). QCA uses set theory and Boolean algebra to identify necessary and/or sufficient conditions. Further details on methods are included in the appendices.

AGENCIES’ COORDINATION CONCERNS AND COORDINATION MECHANISMS SELECTED UNDER SGMA

Agencies’ concerns about the risks of coordination under SGMA varied across basins. [Table 2](#) shows the frequency of concerns at the basin-level, which range from all four types of concerns being present to all four being absent. *Autonomy* concerns were most prominent (11/19 basins), followed by *distribution* concerns (8/19 basins). *Distribution* concerns were often associated with variation in agencies’ access to surface water or perspectives on responsibility for reducing pumping. *Defection* concerns were substantially less prevalent (2/19 basins). With regards to *defection*, agency representatives expressed either the concern that another agency might not reduce its groundwater pumping or implement projects and management actions as planned or the concern that another agency might not enter into an agreement in good faith. *Compliance* concerns were somewhat more common (5/19 basins). In several basins, agencies’ concerns about *compliance* reflected worries that allowing each agency to decide its own path rather than undertaking a collective approach would not achieve groundwater sustainability and risk state intervention. Conversely, in other basins, agencies considered the risk of noncompliance to be higher under greater coordination. The two most prevalent concerns—*autonomy* and *distribution*—often occurred in tandem, reflecting the perceived connection between decision-making autonomy and the resulting division of coordination costs and benefits. Both concerns were also connected to control over water sources in basins where some, but not all, agencies had surface water rights in addition to groundwater.

In making choices regarding GSA formation and GSP development, agencies adopted rules and procedures

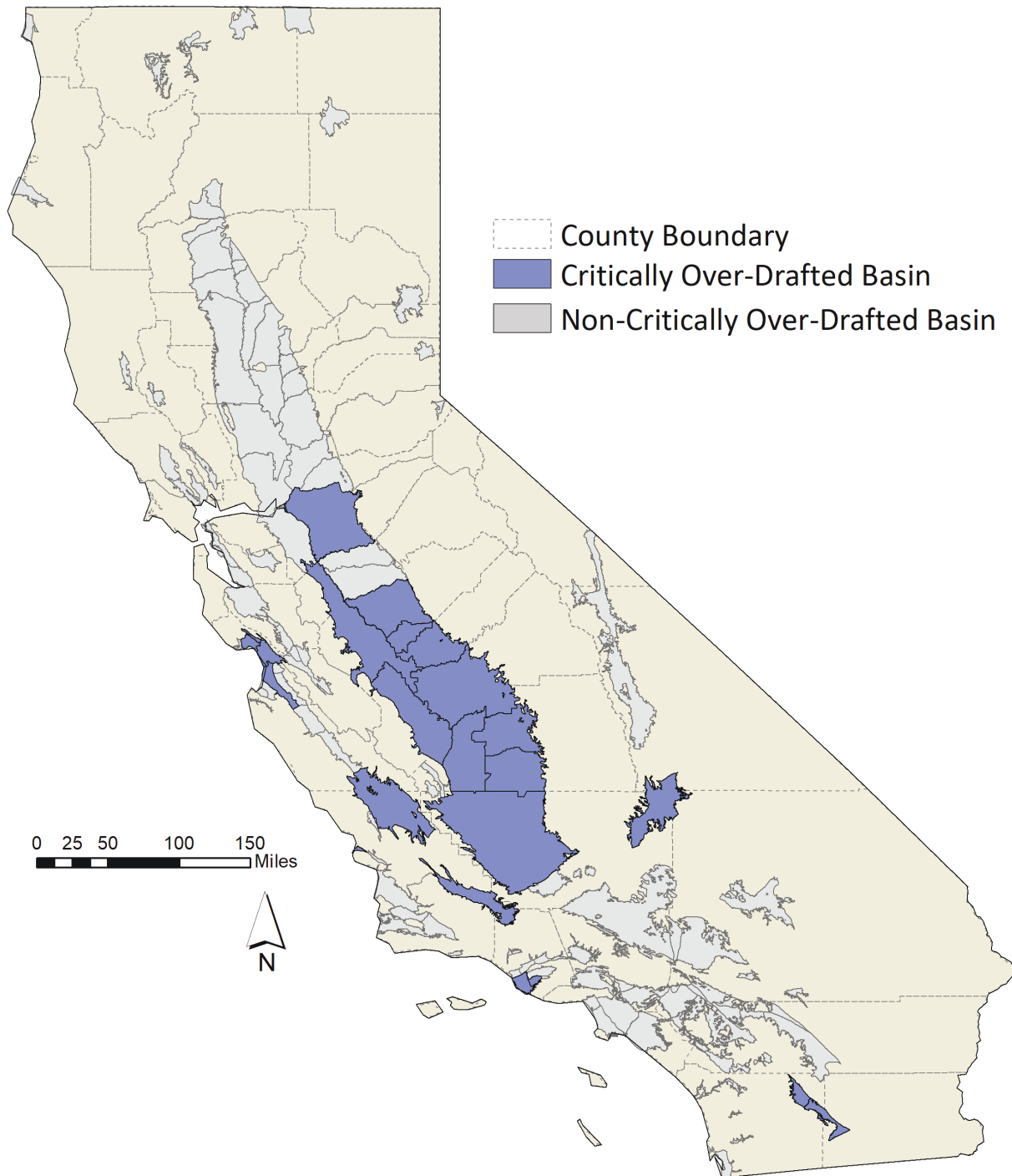


Figure 1 Groundwater Basins Designated as Critically Over-Drafted Under SGMA

governing how these institutional arrangements would function. Varying combinations of coordination arrangements could create essentially equivalent coordination practices. For example, a GSP created jointly by multiple GSAs under non-binding rules might function similarly to each agency forming its own GSA and fashioning a separate GSP subject to coordinated implementation. Consequently, we categorized the coordination mechanism resulting from the combined set of decisions related to GSA formation and GSP development using the attributes of coordination mechanisms described in Table 1.

Table 3 summarizes the coordination mechanisms adopted by the basins in the study, grouping together basins selecting coordination mechanisms with similar attributes. Across the basins, agencies adopted four distinct coordination mechanisms. *Mechanism A* entails fully joint decision-making with binding authority. *Mechanism B* entails limited scope joint decision-making with binding authority. *Mechanism C* entails limited scope joint decision-making with non-binding authority yet includes a clear allocation of responsibility to agencies. Lastly, *Mechanism D* entails decision-making through deliberation only with non-binding authority.

Table 2. Concerns About Coordination Held by Agencies in Each Basin. X Denotes a Majority of Agencies in the Basin Hold the Concern, – Denotes the Concern was not Widespread in the Basin.

# of Basins	Autonomy	Distribution	Defection	Compliance
8	--	--	--	--
4	X	X	--	--
3	X	X	--	X
1	X	--	--	--
1	X	X	X	--
1	X	--	--	X
1	X	X	X	X

Table 3. Coordination Mechanisms Adopted by Each Basin, by Attributes. X Denotes the Coordination Mechanism Contains this Attribute, – Denotes the Coordination Mechanism Does Not Contain this Attribute.

Coordination Mechanism	# of Basins	Mechanism Authority Binding	Decision-Making			Performance Targets
			Fully Joint	Limited Scope	Deliberative Only	
<i>Mechanism A</i>	7	X	X	--	--	--
<i>Mechanism B</i>	4	X	--	X	--	--
<i>Mechanism C</i>	4	--	--	X	--	X
<i>Mechanism D</i>	4	--	--	--	X	--

RELATIONSHIP BETWEEN INDIVIDUAL CONCERNS AND COORDINATION MECHANISM CHOICE

A first step in understanding the forms of coordination that will emerge under a coordination mandate is to examine the relationship between individual concerns and individual attributes of coordination mechanisms. Drawing on the ICA Framework, as well as the related literature on inter-organizational relationships, we hypothesized the below described influence of each type of concern on selection of coordination mechanisms, as summarized in Table 4.

Hypothesis # 1: Agencies with autonomy concerns will employ a coordination mechanism that entails decision-making processes that are deliberative only and/or non-binding.

Agencies value self-determination and seek to protect their budgets, personnel, and resources (Bardach 1996; Peters 2018; Verhoest et al. 2004). Under a mandate, agencies fear that the required coordination may lead to loss of turf or create a dependency on other agencies (Zhou and Dai 2021). By selecting a coordination mechanism that is deliberative only, agencies retain control over their policies and resources. By selecting a coordination mechanism that is non-binding, agencies avoid being locked into any particular path of action.

Hypothesis #2: Agencies with distribution concerns will employ a coordination mechanism that entails joint decision-making processes and/or that sets performance targets.

When coordinating, agencies seek to reduce costs and increase the benefits achieved through coordination (Dekker 2004; Feiock 2013; Williamson 1991). A coordination mandate imposes not only direct costs and benefits but also the risk that other agencies' actions may have indirect effects.

Distribution concerns arise when agencies expect that coordination will translate into an unsatisfactory allocation of responsibilities, costs and/or benefits. By selecting a coordination mechanism that employs joint decision-making, agencies can exercise influence over the full set of direct and indirect costs and benefits.

Although joint decision-making provides agencies with influence over the distribution of costs and benefits, it increases the transaction costs of decision-making and implementation. By setting performance targets, agencies can allocate costs, benefits, and responsibilities yet reduce the transaction costs of negotiating details of mandate implementation.

Hypothesis #3: Agencies with defection concerns will employ a coordination mechanism that is binding.

Agencies engaging in inter-organizational relationships want to ensure that partners take agreed-upon actions and achieve the desired outcomes (Anderson et al. 2014; Dekker 2004; Feiock 2013). Defection concerns arise when agencies perceive that one another's failure to follow through on a commitment will lead to additional responsibilities or costs. By selecting a binding coordination mechanism such as contracting, agencies seek greater assurance that coordination partners undertake the actions agreed upon.

Hypothesis #4: Agencies with compliance concerns will employ a coordination mechanism that entails joint decision-making processes and/or sets performance targets.

Agencies responding to a top-down mandate evaluate the implications of taking vs not taking required actions or failing to achieve mandated policy goals (Deyle and Smith 1998; Hill and Hupe 2002; May and Burby 1996). Compliance concerns are most acute when agencies expect full enforcement of the mandate and perceive the costs of non-compliance to be substantial. Agencies then

Table 4. Evaluation of Hypothesis 1–4: Relationships Between Each Type of Concern and Individual Attributes of Coordination Mechanisms

Hypotheses (#)	Concerns [Condition]	Mechanism Attributes [Outcome]	Hypotheses Supported	Set Coincidence Necessity	
			(Y/N)	[Consistency]	[Coverage]
(1)	Autonomy	Deliberative only decision-making	Y	1 (4/4 basins)	0.36 (4/11 basins)
	Autonomy	~Binding authority	Y	1 (8/8 basins)	0.73 (8/11 basins)
(2)	Distribution	Fully joint Decision-making	N	0 (0/7 basins)	0 (0/9 basins)
	Distribution	Performance targets	Y	1 (4/4 basins)	0.44 (4/9 basins)
(3)	Defection	Binding authority	N	0 (0/10 basins)	0 (0/2 basins)
(4)	Compliance	Fully joint Decision-making	N	0.14 (1/7 basins)	0.2 (1/5 basins)
	Compliance	Performance targets	N	0.5 (2/4 basins)	0.4 (2/5 basins)

Notation in the table uses standard QCA terminology. **Bold** font indicates the hypothesis is supported by the data. ~ represents absence of a condition. Set Coincidence reflects the degree of overlap between basins with the specified concerns and those with the specified coordination mechanism attributes. Consistency denotes the proportion of basins adopting the specified coordination mechanism attributes that also hold the specified coordination concern. Coverage denotes the portion of basins with the specified coordination concern that adopted the specified coordination mechanism attribute. A consistency metric value close to one indicates a concern is necessary for adoption of the attribute of the coordination mechanism. As the analysis examines relationships between a single concern and a single attribute of a coordination mechanism, a coverage metric value close to one indicates sufficiency (Ragin 2008, 61–63).

will seek to ensure coordinating agencies collectively meet the requirements of the mandate. By employing joint decision-making, agencies exercise influence over discursive understandings of the mandate as well as the actions to be undertaken. Adopting performance targets as a coordination mechanism alleviates compliance concerns by allocating to each agency measurable outcomes that would meet their collective interpretations of the requirements of the mandate.

The hypotheses described above articulate set-theoretical relationships between concerns (conditions) and attributes of coordination mechanisms (outcomes). To test these relationships using our empirical data on SGMA, we use set coincidence to evaluate whether the condition is necessary and/or sufficient for the outcomes posited. A hypothesis is supported if the condition being evaluated is either necessary or sufficient for the outcome.

Analysis results, summarized in Table 4, provide support for only a few of our hypotheses. The data provide partial support for hypothesis #1: *autonomy* concerns are a necessary but not sufficient condition for adopting deliberative-only decision-making and non-binding authority. Hypothesis #2 is partially supported and partially contradicted. *Distribution* concerns are a necessary yet insufficient condition for performance targets, but they do not lead to fully joint decision-making. *Defection* concerns had the opposite of the expected effect from hypothesis #3, although as noted earlier only two basins out of 19 held defection concerns. In those basins, the presence of *defection* concerns coincides with the adoption of non-binding decision authority, suggesting that rather than encouraging agencies to adopt authoritative arrangements to alleviate concerns (as posited), *defection* concerns may signal lack of trust and an unwillingness to be bound in an agreement with another agency. Hypothesis #4 is contradicted: *compliance*

concerns are unnecessary and insufficient for explaining adoption of fully joint decision-making or performance targets.

RELATIONSHIP BETWEEN COMBINATIONS OF CONCERNS AND COORDINATION MECHANISM CHOICE

We next examine how multiple concerns combine to influence selection of coordination mechanisms. To do so, we employ crisp-set QCA to identify the configurations of concerns sufficient for adopting each of the four overarching coordination mechanisms identified in Table 3. Supplementary Appendix 3 contains further details, truth tables, and results of each sufficiency analysis. We then draw on the ethnographic data from interviews and observation of meetings to provide additional insights and interpret the results.

Findings from the QCA sufficiency analyses indicate that concerns alone are insufficient for explaining coordination mechanism selection by a majority of the basins. Except for *Coordination Mechanism A* (fully joint decision-making with binding authority), inconsistencies in the patterns of concerns held by the basins adopting similar coordination mechanisms precluded a solution to the QCA analysis. This is because, as shown by the ethnographic data, in addition to concerns about the risks of coordination, agencies' selection of coordination mechanism was influenced by the expected effect of the mechanisms on the efficiency and efficacy of implementation along with their interpretations of what actions would be necessary to comply with the mandate.

Coordination Mechanism A

Seven basins selected fully joint decision-making and binding authority. We note two patterns of concerns related to this

mechanism. Six of the basins exhibited a lack of *autonomy* concerns. The other basin held *autonomy* concerns, lacked *distribution* concerns, and had *compliance* concerns. In this basin, groundwater overdraft is extensive and alternative sources for water are extremely limited. Agencies in that basin agreed that management actions to reduce groundwater pumping would be essential for *compliance* and agreed that despite their *autonomy* concerns they needed joint decision-making to ensure sufficient management actions would be undertaken and to address potential conflict regarding those actions.

The QCA sufficiency analysis solution has a consistency of 0.78 (Supplementary Appendix 3), indicating that there are contradictory cases. Specifically, two basins without *autonomy* concerns instead adopted *Coordination Mechanism B* (limited scope decision-making). Ethnographic data indicate that in those two basins, *autonomy* concerns were not the reason they rejected fully joint decision-making. Rather agencies were focused on expeditious implementation of their already planned projects. As explained by an individual from an agency in one of the basins:

“the rationale for this decision was the long-standing engagement of [redacted] agencies in groundwater management and water supply reliability planning ... [for several projects] work has proceeded far enough to make it significantly more efficient for these agencies to continue their efforts rather than switching project implementation actions to the [collective of agencies]” (GSP#36: pg4-1)

Coordination Mechanism B

Four basins selected a coordination mechanism that entailed limited scope joint decision-making with binding authority. Concerns held by these basins varied, precluding a solution to the QCA sufficiency analysis. In two basins, agencies held a mix of *autonomy* and *distribution* concerns, whereas in the other two basins agencies did not have these concerns. Ethnographic data indicate that in these four basins, *compliance* concerns combined with considerations of efficacy and efficiency, and in some instances *autonomy* concerns, to influence the basin's choice of coordination mechanism. Avoiding joint decision-making about policy and actions helped to assuage agency concerns in the two basins in which agencies were worried about *autonomy*.

Most agencies in these basins believed actors were already planning or could reasonably pursue the actions needed to achieve sustainable groundwater conditions. However, they had concerns about complying with SGMA's shared knowledge and goal setting requirements. Beyond concerns, agencies in these basins also contemplated the added value of coordination when selecting their coordination mechanism. By working jointly on scientific assessments of the state of the basin, setting sustainability metrics, and monitoring basin conditions, agencies would address what they saw as the primary challenge to compliance with SGMA while also benefiting from economies of scale. As one interviewee explained:

“There's benefits to not doing things four times, you can just have one entity doing the monitoring, or filling the data gaps, or some of that more of the practical stuff.” (Interviewee #50)

While compliance and efficiency mattered, agencies in all four basins were also concerned about garnering the necessary constituent support for actions needed to achieve groundwater sustainability and wanted to select the mechanisms that would generate and maintain that support. As explained by one interviewee:

“It's hard for us to justify taking rate payer money to do things that don't have a direct benefit back to that rate payer... taking that money and putting it into projects that are outside of their area or even benefiting their own water system is going to be problematic.” (Interviewee #2)

Consequently, agencies restricted joint decision-making to basin monitoring and measurement tasks while leaving agencies to select and to implement their own projects and policies.

Coordination Mechanism C

Four basins selected a coordination mechanism that combines limited scope joint decision-making with performance targets. In all four basins, agencies had *autonomy* and *distribution* concerns yet varied in their *defection* and *compliance* concerns. Four other basins held similarly mixed configurations of concerns, yet instead adopted *Coordination Mechanism D* (deliberative only with non-binding decision-making). Because all eight basins held similar concerns, the QCA sufficiency analysis could not identify configurations of concerns sufficient to explain selection of either *Coordination Mechanism C* or *D*.

Our ethnographic data indicate the reasons basins selected limited scope decision-making with performance targets varied. In two basins, adoption of performance targets was linked to a combination of *autonomy* and *compliance* concerns. In these basins, agencies believed it possible to achieve groundwater sustainability across at least a portion of the basin. Further, they expected that the state would evaluate non-compliance on a localized basis (by GSP) rather than for the basin as a whole. Consequently, as explained by one interviewee:

“Everyone wanted to be able to tell their own story” (Interviewee #25)

In these basins, performance targets served the dual purpose of supporting agencies in arguing that their portion of the basin was in compliance, while also protecting autonomy to make their own decisions.

In a third basin, *distribution* concerns led to adoption of limited scope decision-making with performance targets. There, agencies recognized compliance would require substantial pumping reductions and land fallowing but differed about how such reductions should be achieved and where land should be fallowed. Particularly prevalent were concerns that larger commercial farms served by a minority of agencies would seek to reduce basin-wide water use by buying out the smaller farms represented by a majority of agencies. Allocating groundwater yield to each agency (setting performance targets) provided a means to fence off those larger pumpers.

In the fourth basin selecting limited scope decision-making with performance targets, agencies adopted the coordination mechanism primarily to support their management actions

rather than to address coordination concerns. Agencies in this basin saw pumping reductions as necessary for achieving sustainability. Allocating the basin yield among agencies was seen as a needed step toward developing a market for groundwater trading and crediting, which was perceived by the participating agencies as providing the most efficient and acceptable way of reducing groundwater pumping.

Coordination Mechanism D

Four basins selected deliberative only decision-making with non-binding authority. While configurations of concerns varied across the basins selecting this coordination mechanism, within each basin at least one agency insisted on operating fully independently. As one interviewee said:

“We never really even considered doing a joint GSP. We always wanted to do one on our own.” (Interviewee #9)

Our ethnographic data indicate these agencies would not accept a coordination mechanism that would impose any form of oversight over their decisions. The specific groundwater context of these basins reinforced this desire for independence, as the distribution of groundwater problems across each of these basins was especially heterogeneous. For example, in two of the basins, land subsidence is a serious problem in only a portion of the basin. In those basins, agencies saw independence as necessary for addressing subsidence and other distinctive groundwater-related problems within their respective jurisdictions.

These staunchly independent agencies constrained the options for basin-level coordination since their refusal to

consider other coordination mechanisms outweighed any other concerns or lack thereof held by other agencies.

A CONTINGENCY EXPLANATION OF AGENCY COORDINATION MECHANISM CHOICE UNDER A MANDATE

Our analysis of the relationship between concerns and the coordination mechanisms selected by basins complying with SGMA illuminates how agencies weigh varying considerations when deciding how to coordinate in response to a mandate. Seven configurations of concerns emerged across the 19 basins (Table 2), who then adopted 4 distinct coordination mechanisms (Table 3). Basins adopting the same coordination mechanism did not always share the same concerns. This equifinality demonstrates a lack of simple cause-to-effect linkages from any one concern to the selection of a coordination mechanism. Moreover, concerns combined with other considerations to influence coordination mechanism choice.

These findings suggest the need for a contingency approach that accounts for how differing conditions influence selection of institutional arrangements (see e.g., Ansell and Gash 2008; Molenveld et al. 2021). Drawing on our ethnographic data and informed by the QCA results, we trace the considerations of agencies to develop the following contingency theory of agency choices under a mandate to coordinate (figure 2).

Autonomy forms the starting point for selection of coordination mechanisms. Across the basins, autonomy is the most frequent type of concern; it rarely occurs in isolation from other concerns; and no other types of concerns occurred

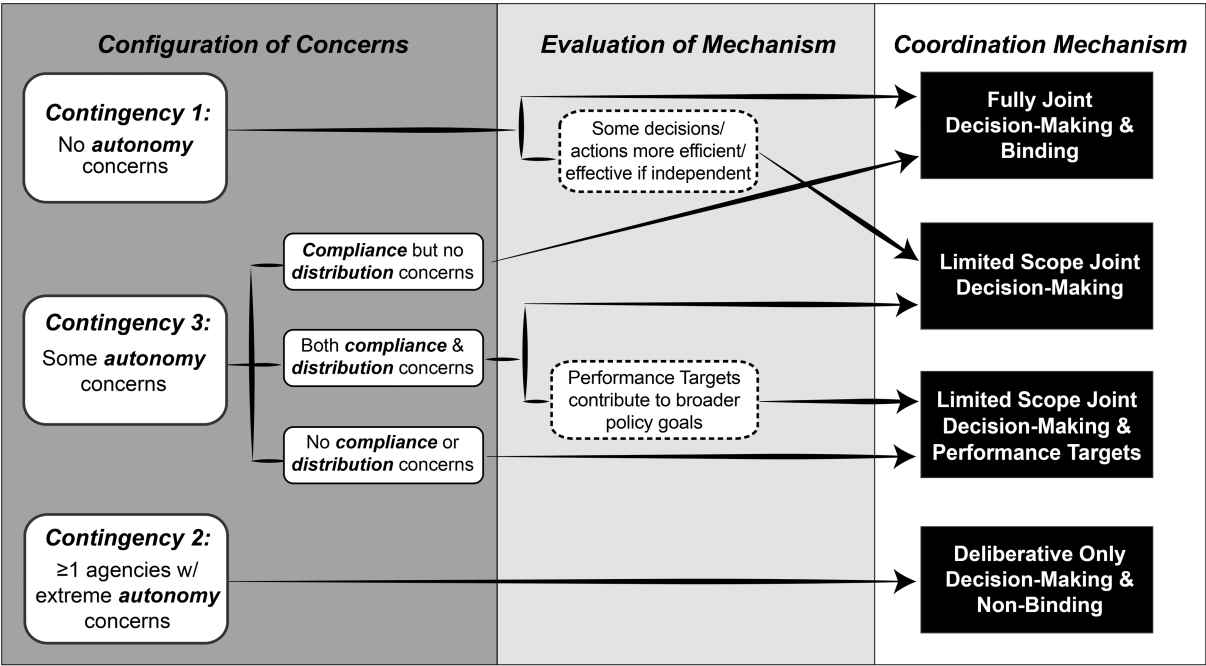


Figure 2 Contingencies Guiding Coordination Mechanism Choice. Agencies’ choice of coordination mechanisms is guided by their concerns about the risks of coordination and the costs and benefits of differing coordination mechanisms. Under a mandate, agency concerns about loss of autonomy is the keystone that sets the path for coordination decisions. When agencies do not have autonomy concerns (Contingency 1), they will generally comply by engaging in fully joint decision-making. When agencies have autonomy concerns, two paths emerge. If one or more agencies have intransigent autonomy concerns (Contingency 2), the agencies will engage in deliberative-only decision-making. Otherwise, agencies will employ a coordination mechanism that employs some form of joint decision-making, the scope of which will depend on how agencies balance their autonomy concerns with their concerns about compliance with the mandate, distribution of responsibilities, and any potential mutual gains from working together.

without *autonomy* concerns also being present. Confirmation of hypothesis #1 as well as the QCA sufficiency analysis for *Coordination Mechanism A* (fully joint decision-making with binding authority), also indicate that agency choices under SGMA were highly influenced by the presence (or absence) of *autonomy* concerns. These observations are compatible with a recent survey of GSA managers (An and Tang 2022), which found *autonomy* concerns to be a central consideration in decisions regarding GSA formation.

Our ethnographic data suggest the risk of *autonomy* loss functions as a threshold concern that sets the stage for agency selection of coordination mechanisms. When deciding how to coordinate under a mandate, agencies evaluated *autonomy* prior to evaluating other considerations. The first contingency is thus whether there is a presence or absence of concerns about *autonomy*. If agencies do not have *autonomy* concerns, they will adopt joint decision-making with binding authority. Whether that decision-making is fully joint or limited in scope will depend on agencies' perceptions of whether some actions will be more efficient or effective if undertaken separately. This first contingency is demonstrated by the basins selecting *Coordination Mechanism A* (fully joint decision-making with binding authority), and one of the basins selecting *Coordination Mechanism B* (limited scope joint decision-making with binding authority).

The second contingency is whether any one agency wants to protect its *autonomy* above all else. When agencies' coordination concerns differ, even if most agencies share concerns, a single agency disagreeing can greatly influence the forms of coordination undertaken. In this context, agencies have limited options for working together and may select mechanisms with deliberative-only decision-making and non-binding authority.

The third contingency covers situations in which agencies have *autonomy* concerns yet are willing to work together. Here, agencies will engage in some form of joint decision-making, the boundaries of which will be determined by how agencies balance their concerns about *compliance* with mandate requirements, their perceptions of the costs and benefits of working together, and their concerns about the *distribution* of those costs and benefits. How those considerations combine can lead agencies down three potential pathways.

One pathway encompasses agencies with *autonomy* concerns but without *compliance* or *distribution* concerns. These agencies will adopt coordination agreements with limited-scope joint decision-making and may adopt performance targets. This choice, observed in two of the basins selecting *Coordination Mechanism B* (limited scope decision-making with binding authority), and two of the basins selecting *Coordination Mechanism C* (limited-scope decision-making with performance targets), is consistent with the ICA Framework's efficiency argument, i.e., agencies seek to minimize risks and maximize benefits of coordination. Limited-scope joint decision-making allows agencies to balance autonomy concerns with anticipated benefits of coordination.

The second pathway in this contingency encompasses agencies with autonomy concerns plus *compliance* and *distribution* concerns. These agencies will adopt mechanisms with both limited-scope joint decision-making and performance targets. This choice, demonstrated by two of the four basins selecting *Coordination Mechanism C* (limited-scope decision-making with performance targets), aligns with our hypotheses related to the effects of *compliance*

and *distribution* concerns. Here, limited-scope joint-decision making allows the setting of performance targets. Use of performance targets concurrently addresses concerns about meeting the requirements of the mandate and the allocation of responsibilities while preserving as much autonomy as possible.

The last pathway in this contingency encompasses agencies with both *autonomy* and *compliance* concerns that do not hold *distribution* concerns. These agencies will adopt coordination mechanisms that involve fully joint decision-making with binding authority. This choice matches the basin selecting *Coordination Mechanism A* (fully joint decision-making with binding authority) despite agencies holding *autonomy* concerns. It also illustrates that strong *compliance* concerns can outweigh some *autonomy* concerns, particularly in the absence of strong *distribution* concerns. Joint decision-making with binding authority may seem the most effective means of avoiding penalties for non-compliance even though it encroaches on agency autonomy.

Notably, several sets of conditions led to the selection of coordination mechanisms with the same attributes. Fully joint decision-making, for example, was selected in basins where agencies did not have *autonomy* concerns but also where agencies did have *autonomy* concerns combined with strong *compliance* concerns. Similarly, limited-scope decision-making was selected in basins that had *autonomy* concerns combined with *distribution* concerns, but also in a basin where agencies did not have *autonomy* concerns but thought it would be more efficient or effective to make some decisions independently. Limited-scope decision-making plus performance targets was arrived at in basins where agencies had *autonomy*, *compliance*, and *distribution* concerns but also in cases where those concerns were not present if one or more agencies saw performance targets as serving their other policy objectives.

Further, it merits mention that *defection* concerns do not appear in the contingencies. This may be due to the low prevalence of *defection* concerns in our dataset. Since defection was a real possibility, we do not know why few agencies held concerns about it. Indeed, after coordination mechanisms were selected, yet while GSPs were still being developed (i.e., after research for our study was completed), defection occurred in four of the nineteen basins. One or more agencies withdrew from a GSP, refused to sign a final form, or submitted to the state a GSP containing information that was inconsistent with the submissions from other agencies in the basin. With regards to the effects of *defection* concerns, agencies in the two basins where such concerns were present also had *autonomy* and *distribution* concerns. We expect the attributes of the coordination mechanisms selected to address those concerns served to sufficiently assuage agencies' *defection* concerns. Further research is needed to confirm this supposition and test its role in our contingency theory.

THEORIZING INTER-AGENCY COORDINATION UNDER A MANDATE

The contingencies identified above have implications for theorizing coordination under a mandate. Foremost, our analysis of coordination under SGMA affirms that, with some revisions, the ICA Framework's conceptualization of agencies' decisions regarding how to coordinate has applicability to mandated coordination. The ICA Framework propounds

that coordination risks, then net benefits, drive coordination mechanism selection. Our findings add important nuance to this conceptualization by depicting a hierarchy of coordination risks. Agencies responding to SGMA first evaluated and addressed their concerns about autonomy. Subsequently they evaluated other types of concerns, followed by looking at the potential benefits of coordination.

The prominent role of *autonomy* in this hierarchy of concerns also confirms our expectation that the ICA Framework's characterization of coordination risks does not reflect the full spectrum of risks that may arise when coordination is mandatory rather than voluntary. Specifically, the presence of a mandate changes how agencies consider the prospect of loss of *autonomy* and adds the risk of non-compliance, while removing the risk of not identifying coordination partners.

As stated above, because the ICA Framework conceptualizes voluntary coordination, it treats *autonomy* as a transaction cost and thus something agencies might be willing to forego if outweighed by the benefits of coordinating. Yet when mandated to coordinate, as our data show, agencies view autonomy as an existential concern rather than as a cost. This perspective propels consideration of autonomy to the front of decision-making processes. The presence of an extensive scholarly literature on bureaucratic turf-protecting behavior (e.g., Bardach 1996; Bjurström 2019) suggests in many instances mandates will evoke autonomy concerns. While a majority of basins in our study had strong autonomy concerns, autonomy was not a concern in every basin. Moreover, in some basins, concerns about autonomy differed across agencies. Our findings that autonomy concerns are commonplace, yet their occurrence can also be variable, highlights the need for theories of mandated coordination to deeply engage with the effects of a mandate on agencies' sense of control and self-determination. It also points to the need to develop better understandings as to why autonomy concerns arise in some instances and not in others.

In contrast to *autonomy*, concerns about *compliance* appear to have a less pronounced role in selection of coordination mechanisms. Only a handful of basins held compliance concerns and, when present, compliance concerns only influenced coordination mechanism selection when there was not one or more agencies in the basin that held extreme autonomy concerns. The implication of this finding for theorizing mandatory coordination remains unclear.

The presence of an explicit oversight and sanctioning process for non-compliance with a mandate is a factor identified by prior scholars as important for explaining agency implementation of top-down policies (May 1993). While SGMA includes provisions for oversight and sanctioning, agencies responding to SGMA varied in how they interpreted the mandate and its prospective penalties. Some agencies anticipated the state would assess and enforce compliance at the scale of the basin, while other agencies anticipated compliance would be evaluated and enforced at the scale of an agency or subgroup of agencies. Agencies also held varied opinions as to whether the state would intervene should it find a basin to be non-compliant. While this variation is a plausible explanation for the limited role of *compliance* concerns in agency selection of coordination mechanisms under SGMA, it underscores the need for theories of mandated coordination to include consideration of the design of coordination mandates. Not only will the extent to which *compliance* concerns emerge

depend on agency perceptions of oversight and sanctioning of the mandate, we can expect variability as to how 'street level bureaucrats' perceive their responsibilities and the risk of noncompliance with a mandate (see e.g., Hupe and Hill 2016; May 2015). Comparative research across mandates with differing levels of specificity; varying oversight and sanctioning processes; and that range in their credibility of enforcement by higher levels of government is needed to provide sufficient evidence for fully theorizing the role of *compliance* concerns.

In addition, our findings highlight the importance of accounting for the multi-lateral dynamic of coordination when theorizing mandated coordination. The second contingency identified above encompasses the situation in which one or more agencies force the selection of coordination mechanism by refusing to participate in a mechanism that may constrain its autonomy. In some basins, not only did agencies that engaged in coordination not hold similar autonomy concerns, but some had greater influence over what mechanisms were selected for coordination. Differences in the perspectives of coordinating agencies are not well addressed in the existing literature on inter-agency coordination, in part due to the literature's emphasis on voluntary coordination, under which, if strong differences exist, agencies can simply choose not to coordinate. Future research is needed to examine, perhaps from a game-theoretic perspective, how agencies negotiate coordination mechanism selection when their concerns differ so that this dynamic can be accounted for in theories of coordination under a mandate.

CONCLUSIONS

While inter-agency coordination portends multiple benefits, in many instances intervention by higher levels of government is needed to prompt its occurrence. While mandates may be instrumental in bringing about inter-agency coordination, the mechanisms agencies select to coordinate with one another as they respond to a mandate can affect achievement of coordination outcomes (Roberts and Milman 2023). Our research illustrates that, while there are similarities between how agencies make coordination decisions when coordination is voluntary and when coordination is mandatory, the differing risks of coordination that occur under a mandate influence agency behavior. A mandate brings concerns about self-determination and control to the center of decision-making, driving choices regarding how to engage in coordination. How agencies navigate their autonomy concerns is thus likely a central factor influencing coordination outcomes.

Our research also shows how a single coordination mandate can have differential effects. Not only did basins responding to SGMA hold varying concerns about the risks of coordination, even basins with similar sets of concerns selected differing coordination mechanisms. Diverse responses to a mandate may be desirable if that diversity reflects agencies tailoring coordination mechanisms to their respective contexts. Yet the resulting heterogeneity may generate inconsistent implementation and goal attainment. Heterogeneity in coordination may also increase the challenge of steering agency actions in the future, as subsequent steering attempts may be difficult to design for diverse institutional arrangements. Thus, an important unanswered question is the extent to which a mandate should allow agency discretion in deciding how to coordinate.

Lastly, while our research examines mandated coordination in the context of groundwater, our findings are likely generalizable to a variety of social and environmental issues. This includes not only the management of other common-pool resources (e.g., forests, fisheries, and irrigation systems) but any issue where there is potential for transboundary externalities or inefficiencies to arise from a myriad of approaches to knowledge production, goal setting, and/or policy adoption (e.g., health care, transportation, and crime). Agency contexts, including their histories, power dynamics, resource scarcity and competition, organizational missions, and politics will influence their coordination concerns. Improved understanding of how agencies respond to coordination mandates can support policy makers in crafting more effective mandates. Such policy design improvements may in turn enhance the effectiveness of efforts to remediate social and environmental problems through inter-agency coordination.

Supplementary material

Supplementary material is available at *Perspectives on Public Management and Governance* online (www.ppmg.oxfordjournals.org).

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Data Availability

The data that support the findings of this study are openly available at the Qualitative Data Repository. See Milman, Anita. 2023. "Ascertaining Intergovernmental Coordination Mechanisms" <https://doi.org/10.5064/F6QHVGUI>. QDR Main Collection. V1.

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