Local Managers, Loss Aversion, and Sustainability Performance: A Macro-Micro Assessment of Risk

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Abstract

Decades of research in psychology and behavioral economics has established that human beings deviate from rational utility maximization in their consumer, employment, and health choices A normative assumption of government reform efforts such as New Public Management (NPM) is that fostering a more innovative, proactive, and risk-taking organizational culture -- developing what has been described as an "entrepreneurial orientation" (EO) -- is a net positive for improved performance (Bellone and Goerl 1992; Osborne and Gaebler 1992; Swann 2017). But in arenas like urban sustainability and resiliency, performance can be an ambiguous, multifaceted concept, with many definitions that can determine how a city government approaches development (Zeemering 2014). Managers' assessments of their own nimbleness, innovative thinking, and risk culture are also likely to influence how they interpret the risk-reward balance of opportunities to enhance organizational performance and sustainability. Thus, our central research questions are, how do managers assess the risk of sustainability initiatives, and how do these assessments influence organizational commitments? We address these questions through a novel multi-method research design which examines the role of organizational performance and EO at both an institutional and individual level. The results indicate that local governments engage in risk-seeking behavior in order to minimize their potential for losses of prior effort. An experimental extension confirms local government administrators are loss-averse when asked to evaluate the merits of a hypothetical sustainability program, although senior-level administrators appear less so.

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Introduction

When bureaucrat enters the mind of the average citizen, the image likely summons a litany of popular pejoratives: lazy, incompetent, robotic, or risk-averse (Lee and Van Ryzin 2018; Milward and Rainey 1983). Indeed, public managers seemingly “can’t win for losing” -- blamed when government fails, and ignored when it succeeds.

These stereotypes overlook the complexity of problems and policies public organizations confront and the decision-making constraints managers operate within (Kettl 2016; Rutherford and Meier 2015). Often, managers must “make the best call” with incomplete information (Simon and March 1958), but, like all individuals, they also suffer from cognitive biases which can systematically skew decision-making, and consequently impact government efficiency and performance (Meier, Favero, and Zhu 2015; Nicholson-Crotty and Nicholson-Crotty 2017).

This study explores a latent cognitive driver of bias in public managerial decision-making -- aversion to loss (Battaglio et al. 2018). We do so in the context of one of the more complex policy quagmires local governments confront today -- sustainability. Local politics, citizen demands, and competing public values are inextricably linked with urban sustainability, limiting the scope and scale of activities that public managers can utilize to promote sustainable and resilient development (Feiock et al. 2014; Swann and Deslatte 2018).

Decades of research in psychology and behavioral economics premised on bounded rationality has established that human beings deviate from utility maximization in their consumer, employment, and health choices (Kahneman and Egan 2011; Kahneman and Tversky 1986; Redelmeier, Katz, and Kahneman 2003; Thaler and Ganser 2015). In particular, prospect theory pioneered by Kahneman and Tversky (1979) holds that variation in how potential losses and gains are “framed,” in terms of semantics, systematically alters preferences (Tversky and Kahneman 1981). Potential losses outweigh potential gains when choices are presented under risk and uncertainty (Kahneman and Tversky 2013).

A normative assumption of government reform efforts such as New Public Management (NPM) is that fostering a more innovative, proactive, and risk-taking organizational culture -- or developing what has been described as an “entrepreneurial orientation” (EO) -- is a net positive for improved performance (Bellone and Goerl 1992; Osborne and Gaebler 1992; Swann 2017). Yet, we know little about whether managers’ nimbleness, innovative thinking, and risk-taking are influenced by loss aversion when assessing risky opportunities. In the context of urban sustainability, performance is an ambiguous, multifaceted concept, with many definitions that can determine how a city government approaches development (Zeemering 2014). Thus, our central research questions are, how do managers assess the risk of sustainability initiatives, and how do these assessments influence organizational commitments?

We address these questions through a multi-method research design which examines the role of organizational performance and EO at both institutional and individual levels (Hendren, Luo, and Pandey 2018; Mele and Belardinelli 2018). First, we conduct an observational analysis drawing from two national surveys of U.S. local government sustainability activities. We then explicitly test for the causal mechanism of loss aversion using an artifactual survey experiment which manipulates the framing of a potential new methane capture and reuse program. We find support across both analyses for our predictions about loss aversion. When deciding whether to continue funding their local energy-efficiency efforts, local government managers' poor satisfaction with implementation of the program was overwhelmed by positive perceptions of the organization's overall sustainability performance. This positive perception of the organization appeared to drive decisions to continue financially supporting the program, consistent with the "sunk costs of innovation" argument offered by Simon and March (1958, 194). Local governments engaged in risk-seeking behavior in order to minimize the potential for losses of prior effort. Under an alternative experimental condition, local government managers are risk-averse when asked to evaluate the merits of creating a new, hypothetical sustainability program, although senior-level administrators appear less risk-averse.

Behavioral Underpinnings of Organizational Performance and Entrepreneurial Orientation

In recent decades, public administration has adopted the mantra that managers should meet current challenges by thinking and acting more entrepreneurially (Moon 1999; Meynhardt and Diefenbach 2012; Osborne and Gaebler 1992; Teske and Schneider 1994). Scholars have operationalized entrepreneurialism through the dimensions of proactiveness, innovativeness, and risk taking (Meynhardt and Diefenbach 2012). In public organizations, EO is defined as a "commitment to intensity of entrepreneurial actions" (Kim 2010) and often studied at an institutional or "macro" level. An implicit assumption in EO is that managers can use public resources to capitalize on social opportunities (Morris and Jones 1999).

More recently, public administration researchers re-discovered the importance of a micro-level approach to assessing how public administrators, citizens and politicians process information and make decisions (Grimmelikhuijsen et al. 2017; Moynihan 2018; Olsen et al. 2018; Simon 1991). This effort has focused largely on observable cognitive biases such as anchoring (Feeney 2012), confirmation (Grimmelikhuijsen and Meijer 2012), status quo (Jilke, Van Ryzin, and Van de Walle 2016), and framing effects (Belardinelli et al. 2018). The explicit implication of the behavioral public administration movement is that managers may not be good at sorting out promising opportunities from risky gambits (Battaglio et al. 2018; Nicholson-Crotty, Nicholson-Crotty, and Webeck 2019).

These macro- and micro-approaches offer complimentary -- although, not often combinatory -- assessments of a persevering normative belief that governmental reforms, through private-sector tools and thinking, can help address the existential threats facing society (Anechiarico 2007; Fiorino 2018; Ingraham 2005; Kettl 2016). This article leverages these approaches to address the call for greater attention to the role of managerial risk assessments in organizational initiatives (Battaglio et al. 2018; Bullock, Greer, and O'Toole 2019). To do so, we first examine what led organizations to make sometimes sizable commitments to an ongoing, sustainability effort instigated by a massive federal intervention, the U.S. Department of Energy's (DOE) $3.2 billion Energy Efficiency and Conservation Block Grant Program (EECBG). Then, we elucidate the linkages between perceived organizational performance, EO, and the latent cognitive mechanism of loss aversion under experimental conditions (Belardinelli et al. 2018; Bellé, Cantarelli, and Belardinelli 2018; Nicholson-Crotty, Nicholson-Crotty, and Webeck 2019). This provides a more comprehensive examination -- through a historical choice cities made, and a hypothetical experiment -- of the limitations of organizational EO when managers are tasked with assessing risk and making programmatic choices.

Applying a Behavioral Theory of Choice: Organizational Performance and the Sunk Cost of Innovation

Public management entails risk management. Local government managers make decisions in an environment of uncertainty, with limited organizational capacities to confront a litany of development, fiscal, infrastructure, resiliency, ecological, and social problems (Kim and Warner 2016; Portney 2013; Teske and Schneider 1994). Risk-taking is central to government reform movements such as the NPM, which helped popularize performance measurement as a way managers can better assess the risks and rewards of alternative management approaches (George, Baekgaard, and Decramer 2018). The literature on public-sector entrepreneurialism, in particular, stakes a position that risk-taking is necessary for being more entrepreneurial and improving performance (Kearney and Meynhardt 2016; Morris and Jones 1999).

While public management research has not delivered a scientifically valid theory of managerial risk assessment (Bullock, Greer, and O'Toole 2019; Deslatte 2020), the potential for one exists. In connecting a behavioral theory of choice to organizations, Herbert Simon, James March, and those who followed their work have provided the intellectual undergirding for linking performance and risk through elements common to a model of both individual and collective decisions (Baumgartner and Jones 2015; Newell and Simon 1988; Simon and March 1958). The model of bounded rationality includes commonalities between how individual and organizational memories are coded into rules, the limits of attention present in agenda setting, disproportionate information processing, and the role of emotion in setting priorities (Jones 2002). Human experiences shape the rules that organizations create to minimize risks of specific problems through routinization (Simon 1996). Individual and collective attention is not often directed at (low-risk) problems which pose distant or abstract threats (Cohen, March, and Olsen 1972; Jones and Mortensen 2018; Kingdon and Thurber 1984). Neither organizations nor humans can sort all available information and must rely on heuristics when assessing risks (Deslatte 2018; Jones

2001). And people identify emotionally with organizational procedures, allowing ideologies, professional norms or pre-packaged "best practices" guide solutions for high-risk problems (Fernandes and Simon 1999). Grounded in the theory of bounded rationality, managerial risk-assessment should be subject to limits of attention and cognitive capabilities, as well as causally connected to organizational decisions.

Building from these behavioral foundations, Bullock, Greer, and O'Toole outline a research agenda for advancing a theoretically informed view of risk in public management (Bullock, Greer, and O'Toole 2019). They call for greater attention to internal versus external risks, the role of loss aversion, and tendency of managers to apply siloed thinking (narrow frames) to problems. Such an approach hones in on cognitive biases in risk perceptions. For instance, rational risk assessment requires a probabilistic understanding of the possible positive or negative consequences of action (Bullock, Greer, and O'Toole 2019; Jones 2002; Simon and March 1958). However, this is often infeasible because many of the problems public managers face are characterized by uncertainty (Boyne et al. 2005; O'Toole and Meier 1999, 2014).

Urban sustainability meets the criteria for complex, ill-defined problems (Funke 2001), in that: not all variables and outcomes are directly observable; multiple economic, environmental, and social goals may conflict with each other; patterns of connectivity between variables are present; and many outcomes, such as mitigation of climate change, are time-delayed (Fernandes and Simon 1999). Sustainability encompasses a broad spectrum of energy, climate, land use, waste, natural resource, social, and infrastructure goals and objectives (Deslatte and Swann 2016; Opp and Saunders 2013; Swann and Deslatte 2018). Like many goals with uncertain outcomes, long-term sustainability problems such as climate risk often take a back seat to more amenable, quantifiable, and solvable ones such as reducing energy costs. As a consequence, we have little empirical evidence of the relationship between many sustainability policy commitments, entrepreneurial management and risk-taking, and performance (Deslatte, Swann, and Feiock 2017; Deslatte and Swann 2017; Swann 2017).

While it has not been extended to urban sustainability, the behavioral public administration movement has generated a nascent literature on the risk attitudes of public employees and managers (Bellé, Cantarelli, and Belardinelli 2018; Cantarelli, Belle, and Belardinelli 2018; Gilad, Bloom, and Assouline 2018; Tepe and Prokop 2018). This work is based on social psychology, and prospect theory in particular, which has demonstrated the latent cognitive mechanism of loss aversion in which perceived gains from choices under risk and uncertainty are outweighed by potential losses (Tversky and Kahneman 1981).

Applied to organizations, prospect theory holds that the expected utility on an initiative under consideration is relative to some reference point. Boundedly rational organizations rely on learning heuristics (Jones 2002; Simon 1991), and one such heuristic is the gap between past performance and expectations (Meier, Favero, and Zhu 2015; Rutherford and Meier 2015). One model of relative risk aversion suggests public managers' risk preferences are contingent on past performance, varying depending on where the organization falls relative to its aspirational standards (Nicholson-Crotty and Nicholson-Crotty 2017). When past performance is substantially below or above their goals, they are more willing to take chances or search for innovative solutions, and more risk-averse when performance is just meeting expectations. In this sense, organizational decisions are made for performance, and shaped by performance.

A behavioral approach to organizational risk-taking suggests organizations have difficulty making changes, and condition their programmatic decisions less on a comprehensive evaluation of all the potential options than on their recent experiences, agenda-setting efforts, and emotions (Jones 2003). Simon and March called this failure to seek out alternatives the "sunk cost of innovation" (1958, 194), arguing choices between program continuation and initiation are not evaluated equally. Rather, organizations give preference to programs already in existence compared to initiating change. All else being equal, program continuity tends to prevail, while search is reduced as satisfaction increases (Simon and March 1958). Loss aversion manifests in this context as a greater willingness by organizations to expend resources to avoid the losses of discontinuing a program than to achieve gains through innovation (Kahneman and Tversky 2013). Perceptions of performance and entrepreneurial orientation are both heuristics for making such decisions.

An Institutional Context for Choice: Local Sustainability Program Performance

We first examine risk-taking through the context of a U.S. federal program which instigated thousands of local sustainability initiatives. The EECBG program, implemented as part of the American Recovery and Reinvestment Act (ARRA) of 2009, financed roughly 7,400 projects to increase energy efficiency and reduce fossil fuel emissions in local communities (Terman et al. 2016).

Under the program, local governments could conduct energy audits of government and residential buildings; create energy efficiency programs and incentives; making grants for retrofitting buildings; construct bike lanes; start recycling programs; replace street-lighting; install technologies to reduce methane or greenhouse gas emissions from government operations, and many other activities (DOE 2015; ICMA 2010). One of the criteria DOE used for evaluating applicants was the likelihood they would continue their activities after the federal grant had expired (Deslatte 2019). We argue this decision to replace federal one-time funding with recurring, local revenues required risk-assessment. Prospect theory suggests that the risk of losing programmatic benefits outweighs the potential for gaining equivalent benefits from program expansion. A decision to non-renew activities or initiatives started through EECBG grants creates the potential for losses of benefits; however, this evaluation would likely be based on past experiences such as performance and satisfaction with programmatic activities.

Several aspects of bounded rationality are applicable to this decision. Agenda-setting involves assessing stimuli from the environment and classifying them as relevant or irrelevant for decision-making, a process which has been compared to an individual's short-term memory (Jones 2002, 2003). Local governments implementing EECBG-funded activities likely encountered more program-relevant information than what they deemed necessary to make implementation and evaluation decisions. The effect of agenda-setting here is that some performance-relevant data are more heavily weighted than others.

Direct experiences with the program are one form of information which may have influenced choice. Since many of the activities eligible for EECBG funding were new to city governments, they required staff and training. Cities made extensive use of contractors, but the contracted services were subject to federal labor and contracting requirements, thus investments in contract management capacity were necessary (Terman et al. 2016). The EECBG program was plagued by implementation delays, technical challenges with online reporting and monitoring, as well as local governments' lack of staffing and expertise navigating federal grants (DOE 2011; Terman and Feiock 2015). These experiences may have drawn additional attention -- serial processing or the act of attending to one item or issue at a time -- as existing grant-management routines proved inadequate or administrative resources were found lacking. "We were able to do a lot of great projects with the money, but the reporting and close out were horribly time consuming," one local government department manager wrote in response to a 2013 survey of EECBG recipients. While negative experiences with the program may have prompted some cities to abandon their EECBG initiatives, others reported organizational learning and increased buy-in from the experience. "Installing LED streetlights with EECBG funds gave our city confidence to pursue a much larger installation of LED streetlights on our own," one manager wrote. "EECBG broke the ice and has been critical in that effort." The result is that while grant-management is a core function of local governments, direct experience with the EECBG program likely stands out as a learning experience encoding new solutions into organizational memory. These new organizational memories could increase commitment for continuing the program after federal funds expired. Thus, we expect that serial processing -- triggered by problems encountered with the program -- fostered a greater intent to codify efforts, and subsequently, an aversion to wasting these efforts and resources.

The EO literature suggests that managers' assessments of their organization's own nimbleness, innovative thinking, and risk culture are also likely to influence this choice. If this is the case, then an organizational EO should foster a willingness to take risks irrespective of other contradictory or unclear information signals. An expectation derived from this logic is that direct experience with the program -- satisfaction -- interacts with perceptions of EO as organizations considered whether to extend the EECBG program. Managers who work in organizations considered more risk-taking, innovative, or proactive may be willing to overlook negative experiences with EECBG implementation or administration. In other words, organizations with higher levels of EO should be less impacted by low satisfaction, evidenced by a positive interaction effect. We utilize an interactive-term hypothesis (Berry, Golder, and Milton 2012) to state this expectation more plainly:

H1: Local government EECBG satisfaction will have a positive effect on the likelihood of program continuation at all levels of EO; as satisfaction increases, the moderating effect of EO weakens.

Another form of information impacting choice is an organization's perceived overall or diffuse assessment of their sustainability performance. Most of the recipients of EECBG funds either had some previous experience with economic, environmental, or social sustainability efforts, or were initiating sustainability planning and activities beyond those funded through the program (Park, Krause, and Feiock 2018; Terman and Feiock 2015). These diffuse experiences are more likely to influence emotional contagion, which is the arousal of employees' attention to the appropriateness or importance of an organization's mission (Jones 1994). Emotional contagion can be useful for motivating employees, but can override a rational benefit-cost analytic decision process and make it more difficult to change course (Krause, Yi, and Feiock 2016). As a consequence, diffuse experiences with organization-wide sustainability efforts and perceptions of performance should make organizations more averse to risks of loss and more likely to continue the EECBG program irrespective of their direct experience with it.

As previously noted, loss aversion suggests governments should be more willing to preserve existing programs in order to avoid the losses incurred than expand into new ones in the hope of future gains. The relative risk model suggests a quadratic relationship with performance aspirations. These organizations will be more risk-averse when performance is closer to aspirational goals. However, the government reform mantra suggests that organizations with high EO will have a more stable tolerance for risk irrespective of past performance. In this case, the relationship between performance and risk-taking is conditioned on the level of EO. In other words, if EO moderates the risk calculus of organizations, we would expect them to be relatively less risk-averse when performance is closer to aspirational goals. EO would have a positive effect on risk-taking at medium levels of performance, and a more negligible influence at high and low performance levels. We again utilize an interactive-term hypothesis to state this expectation:

H2: Perceptions of organization-wide sustainability performance will have a positive, direct effect on EECBG program continuation at all levels of EO; at mid-range levels of performance, the positive effect of EO strengthens.

An Individual Context for Choice: Loss Aversion and Equivalency Framing

A behavioral approach to organizational risk-taking suggests organizations condition their programmatic decisions based more on an effort to avoid losses than seek out gains. While our prior organization-level EECBG program context reflects a historical risk-taking effort, it cannot account for other collective-choice influences or disentangle loss aversion as a causal mechanism from other elements of bounded rationality which may also influence choice. To address this, we must use experimental conditions to fully examine loss aversion. Prospect theory has established that individuals tend to make less-risky decisions when their choices are framed in terms of options between different "gains" scenarios, and they will take greater risks when choices are framed between probable and determinant losses (Kahneman and Tversky 1986). In other words, individuals will take greater risks to avoid losses than they will to achieve greater gains (Kahneman and Egan 2011).

Public managers are likely to respond to choice scenarios differently depending on how the risk of the situation is framed. This inconsistency in choices under uncertainty has fueled a voluminous economics and political science literature on framing effects (Druckman 2001). In public administration, these studies have tended to focus on *equivalency framing,* in which different but logically equivalent -- often numeric -- descriptions of performance are presented (James, Jilke, and Van Ryzin 2017; Olsen 2015; Piotrowski, Grimmelikhuijsen, and Deat 2017). For instance, Grosso and colleagues (2017) found that citizens were more supportive of an HIV prevention program when shown outputs, the number of people served, as opposed to outcomes, or infections prevented (Grosso, Charbonneau, and Van Ryzin 2017). Loss aversion is the tendency to overweight the potential for losses relative to equivalent gains. Public managers -- just like any other individuals -- may demonstrate greater risk tolerance when their choices are famed as potential losses. Recently, Nicholson-Crotty and colleagues (2019) found by replicating a series of widely used framing experiments that public- and private-sector managers had higher risk tolerance when their alternatives for responding to a hypothetical disease outbreak were framed in terms of population losses as opposed to lives saved (Nicholson-Crotty et al. 2019).

We expect this loss-aversion tendency extends to sustainability program scenarios in which public-sector works must consider the pros and cons of allocating public resources to achieve public purposes. Thus, we hypothesize:

H3: Local government employees will be more risk-seeking when new sustainability program costs and benefits are framed in terms of losses as opposed to equivalent gains.

The final proposition we explore is whether an organizational EO influences the perceptual weights managers assign to opportunities for gains and losses -- and thus, their risk behavior -- relative to sustainability initiatives.

The government reform agenda of recent decades assumes managers can be more risk-taking, although such normative theories as NPM do not specify the types of risk or conditions under which risk should be minimized (Bullock, Greer, and O'Toole 2019). Public administrators have long been viewed as more risk-averse than their private-sector counterparts (Merton 1939), although the evidence for this claim is mixed. Some studies claim public employees have a lower tolerance for risk than private ones (Guiso and Paiella 2008), and that selection into public employment is itself an act of risk aversion (Lewis and Frank 2002; Pfeifer 2010), while others challenge the notion of systemic public-private differences (Bozeman and Kingsley 1998; DeHart-Davis 2007; Tepe and Prokop 2018). This literature does not consider the extent to which organizational EO may also influence the willingness of public managers to be more or less risk-taking.

There is some recent evidence which suggests public administrators are more willing to be entrepreneurial when facing immediate resource constraints (Singla, Stritch, and Feeney 2018). However, no studies of which we are aware examine whether EO mitigates or exacerbates loss aversion.

Identification with an organization's mission is one element of bounded rationality relevant for this question. Because the literature does not delve into the appropriateness of risk-taking, we expect that individuals in organizations with higher EO will be more risk-taking regardless of whether opportunities are framed as equivalent losses or gains.

H4: EO will be positively associated with risk-seeking when new sustainability program costs and benefits are framed in terms of both gains and losses.

Research Design

Our study draws data from multiple sources in order to test whether the cognitive mechanism of loss aversion is more likely to influence the willingness of local governments to engage in sustainability initiatives. We utilize two inferential approaches which focus on institutional and individual levels, respectively.

Institutional Analytic Method

The institutional-level analysis uses responses from two national surveys of U.S. local governments which received EECBG funding for sustainability programs. The program, which distributed $3.2 billion in funds from the American Recovery and Reinvestment Act (ARRA) of 2009, financed more than 7,400 projects undertaken by 2,187 state, local, and tribal governments. The surveys were administered in 2012 and 2013. The first survey asked local government managers designated as the official liaison to the federal government a battery of questions assessing the EO of organizations, their satisfaction with the program, and their overall organizational performance on sustainability goals. The second survey asked whether and how they planned to continue their programs or initiatives after their federal grant funds were exhausted. Merging responses of governments which responded to both surveys yielded a dataset (N = 338) of cities and towns to address the potential for single source bias by drawing our independent and dependent variables from separate survey instruments (Favero and Bullock 2015).

The dependent (endogenous) variable, commitment to sustainability program continuation (*commit*), was measured with responses to the 2013 survey (T2), which asked: "For any of the program categories below that were supported by EECBG grant funds, please indicate what happened or what you anticipate will happen with the termination of the EECBG grant." We used 10 survey items, covering a wide range of energy efficiency, green infrastructure, and conservation programs (appendix A). We coded the survey responses as follows: "most will be terminated" = -1; "service not funded with EECBG" = 0; "most will be continued at reduced level" = 1; "most will be continued at same level" = 2 (Cronbach's α = .86).

Three independent (exogenous) variables were developed from responses to the 2012 survey (T1). First, we measured *EO* with five 5-point Likert-type scale items (1 = strongly disagree, 3 = neutral, 5 = strongly agree) related to local government organizations' perceived risk taking; innovativeness; bureaucraticness (reversed); growth and resource acquisition; and dynamism and entrepreneurialism (Cronbach's α = .88). Second, we captured perceived performance (*perform*) with responses to the following question: "How would you describe your city's performance in the past two years on the following?" Seven items measured on a 4-point Likert-type scale (1 = situation is worse, 2 = no change, 3 = some positive effects, 4 = big positive effects) were used, including reduction in government energy use; cleaner environment; green job creation; greenhouse gas reduction; financial savings from sustainability; attracting outside investment; and attracting new residents based on sustainability (Cronbach's α = .82). Third, we measured EECBG program satisfaction (*satisfied*) with five 10-point Likert type scale items, including satisfaction with funding disbursement; technical assistance; DOE project oversight; performance reporting; and overall EECBG program satisfaction (Cronbach's α = .90).

To control for local governments' capacity for continuing sustainability programs, we included in the model city population (*pop*) and median household income (*inc*). Cities (or towns) with greater population and higher incomes should be more likely to have sufficient resources for continuing sustainability programs after EECBG funds were expended, and therefore more likely to commit to continuing their programs.

We use these data to construct structural equation models testing the relationships between perceived performance, EO, satisfaction with the EECBG program in T1, and the decision in T2 to continue on with sustainability programs -- a goal of the federal effort, but one that involves the commitment of ongoing local resources and, we argue, a degree of risk and uncertainty. Table 1 reports the descriptive statistics and bivariate correlations for all variables in the model.

Table 1. Descriptive Statistics and Bivariate Correlations

	Var.	Mean	SD	1	2	3	4	5
1	Commit	0.52	0.96					
2	EO	3.19	1.01	0.12*				
3	Perform	2.78	0.61	0.35***	0.23***			
4	Satisfied	6.95	2.49	0.18**	-0.02	0.18**		
5	Population	120,263	166,635	0.18**	-0.11*	0.35***	0.18**	
6	Income	65,428	20,444	-0.09	0.12*	0.02	-0.14*	-0.02

Note: means and standard deviations were calculated by creating averaged scores across the items that comprised the constructs.
*$p < .05$, **$p < .01$, ***$p < .001$

To test the first two hypotheses (H1 and H2), we followed Maslowsky, Jager, and Hemken's (Maslowsky, Jager, and Hemken 2015) recommended procedure for estimating latent moderated structural equations (LMS) using Mplus software (Muthñn and Muthñn 2012). Before estimating the structural models, we confirmed that the measurement model, which included covariances between all latent factors, adequately fit the data. The measurement model is located in appendix A. Except for the chi-square value (684.57, $p < .001$), all indices suggested a strong fit. The root mean square error of approximation (RMSEA) was .058, which is well below the cut-off value of .08 for a good fit. The comparative fit index (CFI) and Tucker–Lewis index (TLI) were .963 and .959, respectively, both greater than .90, indicating a good fit. The standardized root mean square residual (SRMR) of .069 was also below the recommended cut-off value (.08) that would indicate a good fit. The measurement model also demonstrated that the factor loadings for all latent constructs were sufficiently high.

We then estimated the structural models in two steps (Klein and Moosbrugger 2000; Muthén and Asparouhov 2012). In the first step, we estimated structural models without the latent variable interactions for three models: (i) direct effects of *satisfied* and *EO* on *commit* (Model 0a); (ii) direct effects of *perform* and *EO* on *commit* (Model 0b); and (iii) direct effects of *perform*, *satisfied*, and *EO* on *commit*, including control variables (Model 0c). All models demonstrated a good fit based on the suggested cut-off values above. In the second step, we compared the simpler models to the more complex models estimated with latent variable interaction effects (Model 1a, Model 1b, Model 1c, respectively). We used the XWITH statement with Monte Carlo integration to estimate the latent variable interaction models, using maximum likelihood estimation with robust standard errors (MLR) in Mplus. To determine whether the simpler models (Model 0a–c) fit significantly worse than the more complex models (Model 1a–c), we used the recommended log-likelihood ratio test, denoted by *D*:

$$D = -2[(\text{log-likelihood for Model 0}) - (\text{log-likelihood for Model 1})]$$

The *D* statistic can be compared to a χ^2 distribution using degrees of freedom (*df*) equal to the number of free parameters in the more complex model less the number of free parameters in the simpler model. Using log-likelihood values to compare LMS models is a most optimal approach compared to alternatives for such models (Gerhard et al. 2015). Comparing Model 0a to Model 1a (*satisfied* and *EO* on *commit*), we found that the more complex model fit significantly better: χ^2 (1) = 9.75, p < .01. However, comparing Model 0b to Model 1b (*perform* and *EO* on *commit*) without and with the latent variable interaction, respectively, found that the more complex model did not fit significantly better: χ^2 (1) = 0.41, *p* not significant. Finally, comparing the Model 0c to Model 1c (*perform*, *satisfied*, and *EO* on *commit*, including control variables) found the more complex model with the interaction effects fit the data significantly better: χ^2 (2) = 14.5, p < .01.

In sum, the test results justify using latent variable interaction models for Model 1a and Model 1c (for display purposes, we show all three LMS models below), although changes in R^2 values attributed to the interaction terms were very modest: .028 and .068 for Model 1a and Model 1c, respectively.

Individual Analytic Methods

Due to the organizational-level and observational nature of these data, we cannot make causal claims about the underlying attitudes, beliefs, or behavior of public managers. Thus, the individual-level analysis utilizes a survey experiment conducted through TurkPrime, an online platform which empanels behavioral research participants. Use of online labor pools for social experiments has become a burgeoning method for psychology, political science, and public administration research, and offers some advantages over traditional lab experiments in which participants are often college students (Berinsky, Huber, and Lenz 2012; Buhrmester, Kwang, and Gosling 2011; Clifford, Jewell, and Waggoner 2015). Our panel was assembled via TurkPrime's "concierge" service, which facilitates recruitment of specialized panels. In our case, these were U.S. local government employees, who were asked a battery of socio-demographic questions (gender, age, income), and screened to achieve gender balance and a range of non-supervisory, middle-management, and senior positions. The panel (N=543) was recruited in April 2019, and individual respondents were paid $13 for completing the survey. Descriptively, the panel was 72.2% white, had a modal income of over $105,000, and a modal age range of between 35-54 years old. In terms of seniority, 59.3% of the panel reported they did not supervise other employees, 33.2% reported they "hold a mid-level management position and directly supervise other employees," while 7.5% reported they were a senior executive/manager. Table 2 reports the descriptive statistics for the full panel.

Table 2. Descriptive Statistics for Local Government Employee Experimental Panel

Var.	N	Mean	SD	Min.	Max.
Gender (proportion Female)	543	0.513	0.5	0	1
Seniority (1 = no supervisory; 2 = mid-level; 3 = senior supervisor)	509	1.48	0.63	1	3
Income (Modal category: 7 = $105,000 or more)	543	4.38	1.9	1	7
Age (Two modal categories: 3 = 35-44 years old; 4 = 45-54 years old)	543	3.44	1.19	1	6
% White	543	0.722	0.448	0	1

In the equivalency framing experiment, local government employees were presented with a hypothetical scenario in which their organization was considering installing a methane capture and reuse system at its local wastewater treatment plant. We then employed the same equivalency framing approach used in the widely replicated Asian disease outbreak to frame the choices in terms of equivalent losses or gains (Kahneman and Tversky 1986; Nicholson-Crotty, Nicholson-Crotty, and Webeck 2019). To test our hypotheses of risk-seeking and risk-aversion behavior (H3), and how EO shapes such behavior (H4), half the respondents were randomly assigned to an equivalent gains scenario and asked to choose between the following two options:

Option 1	If Project A is adopted, 20% of current local government energy costs will be saved.
Option 2	If Project B is adopted, there is a 1/3 probability that 60% of energy costs will be saved, and a 2/3 probability that no energy will be saved.

The other half were assigned to an equivalent losses scenario and presented with these options:

Option 1	If Project A is adopted, plant operational costs will increase 20%.
Option 2	If Project B is adopted, there is a 1/3 probability that operational costs will increase 60%, and a 2/3 probability that there will be no increase in operational costs.

Consistent with prospect theory and our research hypotheses, we anticipate local government employees to overwhelmingly seek risk when costs and benefits of sustainability programs are framed in terms of losses rather than gains. If more entrepreneurial organizations are more careful risk-assessors, EO should induce risk-seeking behavior irrespective of loss or gain frames of sustainability efforts.

Results

A central contention of this article is that because organizations face limitations on attention and routinize their response to new stimuli, they are predisposed to preserve programmatic activities. In this specific context, loss aversion plays an important role in influencing local government sustainability continuation and innovation. Thus, individuals and organizations are more likely to take risks on sustainability activities in order to avoid losses as opposed to achieving gains. We find support for our overall contention that human and organizational behavior demonstrates loss aversion, both when they consider continuing existing programs or the creation of new ones. However, contrary to government reform orthodoxy, we find limited support for the contention that organization-level EO consistently influences this tendency. Below, we report results from each of these analyses separately, then their implications are discussed in conclusion.

Institutional Level Analysis

We posited local governments drew from two perceptual sources of information when deciding whether to continue their EECBG-initiated programs: their satisfaction with the program based on direct experiences, and their overall, diffuse sense of organization-wide sustainability performance. Because organizations are believed to process information and set agendas in a similar fashion as individuals, they must often prioritize some flows of information over others. The SEM results support this assertion.

Because organizational EO has been normatively touted by government reformers as a solution to the perceptions of inept, overly bureaucratic decision-making in public organizations, we tested both the direct and interaction effect of EO and satisfaction on commitment to program continuation. To make direct comparisons easier, we report standardized coefficients for all paths in the models. Figure 1a shows the path coefficients for Model 1a, and finds that satisfaction ($\beta = .169, p < .01$), EO ($\beta = .147, p < .05$), and their interaction effect ($\beta = .192, p < .01$)are all statistically significant. That is, program satisfaction appears to have a positive effect on the likelihood of EECBG program continuation at all levels of EO (H1). However, we expected the effect of EO to weaken as program satisfaction increased and find no evidence this is the case. Moreover, the direct effects of EO and satisfaction become insignificant in the full LMS model which accounts for overall perceived past performance and our proxy measures for capacity (city population and income) (figure 1c). Rather, EO and satisfaction appear to have an interaction effect on program continuation ($\beta = .248, p < .01$). We take this as evidence that EO plays a role in the decision to continue program activities based on satisfaction levels.

We used the "rhdf5" package in R (Fischer, Pau, and Smith 2019) to create loop plots from the LMS model analysis in Mplus, which display the latent variable interaction effects. Figure 2a shows the estimated effect of high and low EO on the relationship between EECBG program satisfaction and commitment to program continuation, while figure 2b displays the effect of high and low EO on the relationship between performance and program continuation.

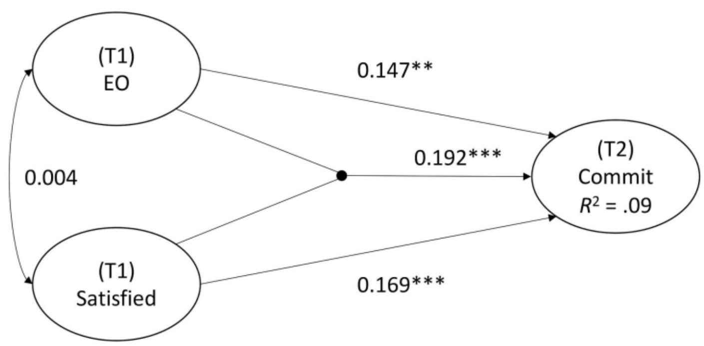


Figure 1a. Model 1a (EO and Satisfaction) (N = 338)

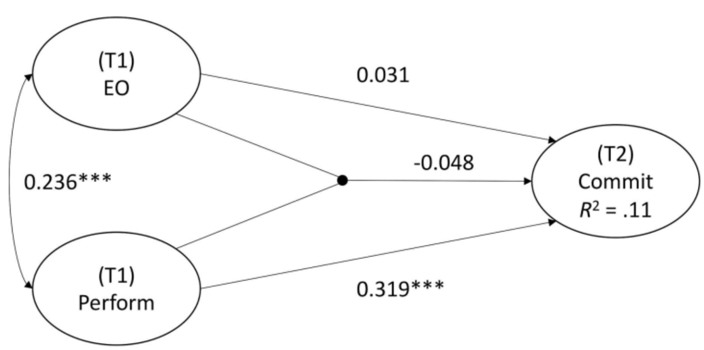


Figure 1b. Model 1b (EO and Performance) (N = 338)

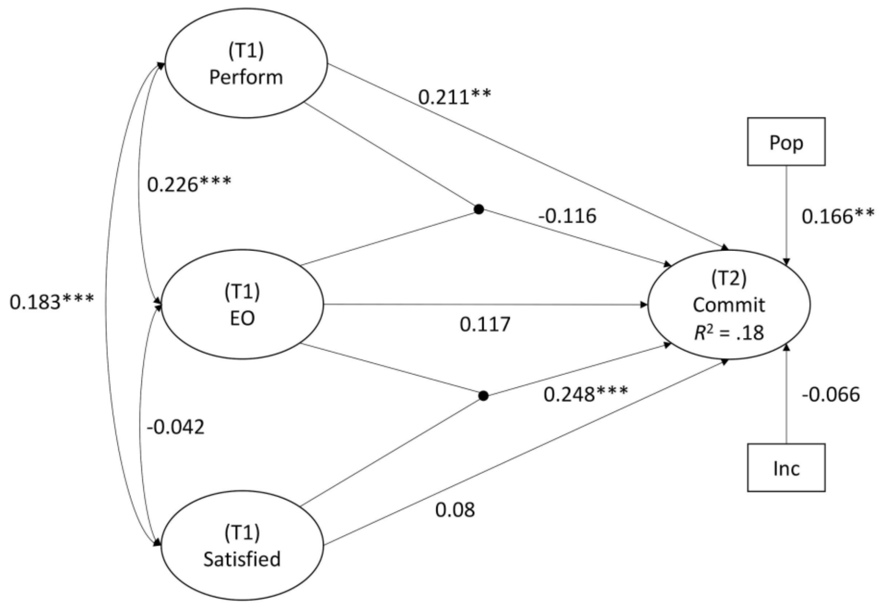
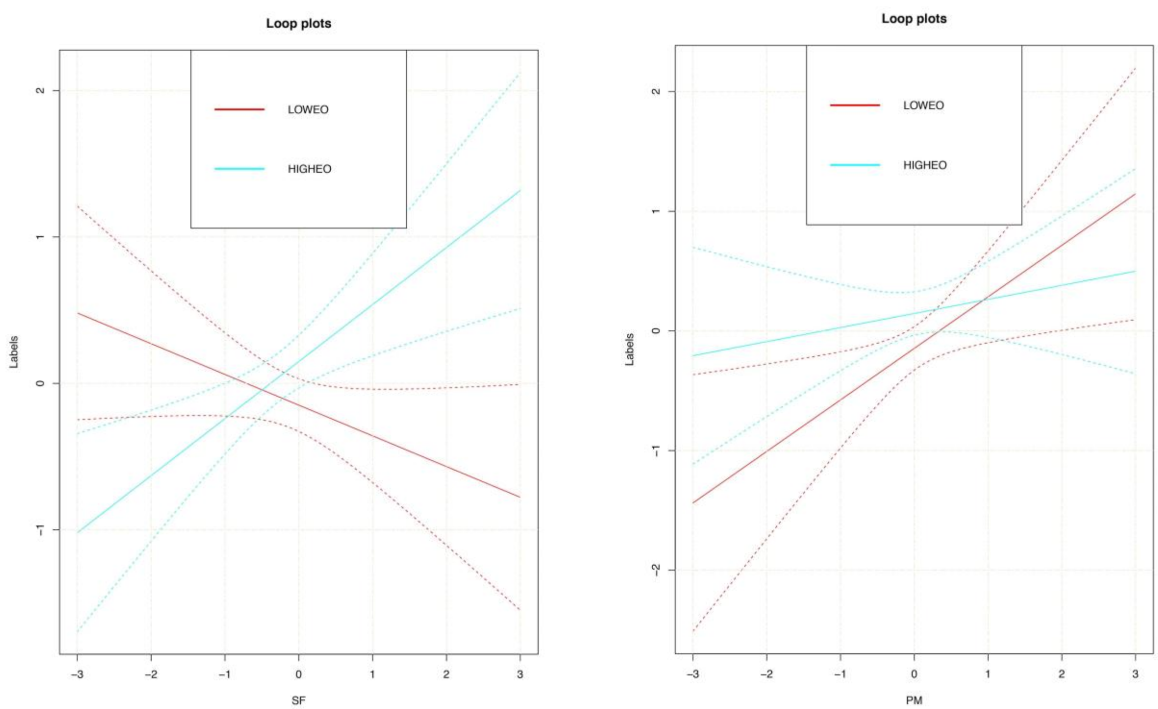


Figure 1c. Model 1c (N = 304)

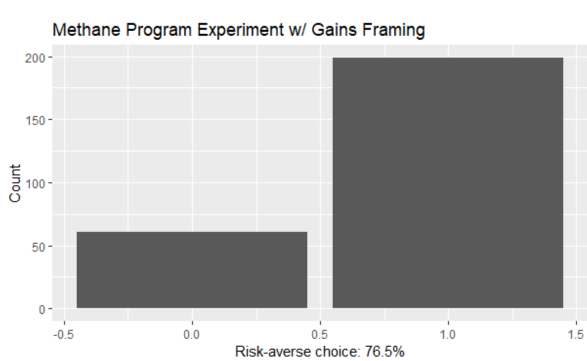


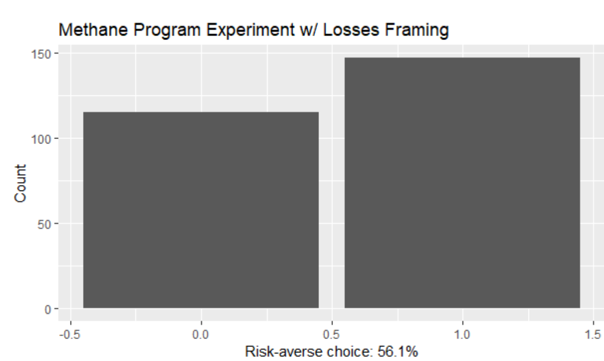
Figures 2a and 2b. *The plot on the left (figure 2a) displays the moderation effect of EO on the relationship between satisfaction and program continuation. Higher EO levels induce a stronger, positive effect for satisfaction. The plot on the right (figure 2b) shows the moderation effect of EO on the relationship between performance and program continuation. Higher EO levels induce a stronger, negative effect for performance, although this effect is not statistically significant.*

Turning to performance, we find evidence in Model 1b and Model 1 c ($\beta = .211, p < .05$) that perceptions of organization-wide sustainability performance had a positive, direct effect on EECBG program continuation (H2). Figure 1b reports the path coefficients for our EO and perform variables along with their interaction term. Only the performance path is statistically significant ($\beta = .319, p < .01$), while the direct effect ($\beta = .031$)and indirect effect of EO ($\beta = -.048$)are insignificant. This result is robust to inclusion of all three predictors in the full LMS model (figure 1c), where we see statistically significant covariances between performance and EO ($\psi = .226, p < .01$)and performance and satisfaction ($\psi = .183, p < .01$). The results indicate that when deciding whether to continue programs, local government officials placed a greater weight on information suggesting overall sustainability performance was high than whether governments were satisfied with the program itself. The full LMS model (Model 1c) suggests this occurs even with controlling for city population ($\beta = .166, p < .05$). Surprisingly, city income level showed a negative -- albeit insignificant -- correlation to program continuation.

Individual Level Analysis

The second experimental design tested the effect of framing a hypothetical methane capture and reuse program in terms of equivalent gains or losses. In the group which received the gains frame, 76.5% of respondents selected the risk-averse option. This result is in line with the voluminous empirical evidence supporting prospect theory (D. Kahneman and Tversky 2013; Bellé, Cantarelli, and Belardinelli 2018). In the loss-frame group, that risk-averse selection dropped to 56.1%, which is a less-precipitous reversal than that found in recent behavioral local government management research (Nicholson-Crotty, Nicholson-Crotty, and Webeck 2019). We first use a chi-squared test to detect whether a statistically significant relationship exists between risk-tolerance and framing. The results support our third hypothesis (H3) that public employees will be more risk-seeking when the cost-benefit balance for a sustainability program is framed in terms of losses ($\chi 2 = 22.01, p < .0001$). This finding has potential normative implications considering that sustainability policy entrepreneurs and advocacy organizations tend to promote the benefits of sustainability rather than the potential economic, environmental, or social losses associated with inaction. We discuss this in greater detail in the following section.





Figures 3a and 3b. *Equivalent gains (left) and losses (right) frames in the methane program experiment demonstrate loss aversion among local administrators. The difference is less pronounced than in many replications of this experiment (Nicholson-Crotty, Nicholson-Crotty, and Webeck 2019) but the difference is statistically significant.*

We then estimated two Bayesian logistic regression models with non-informative priors to examine risk-aversion. The models estimate the influence of EO, past performance, and the seniority of respondents on selecting the risk-averse methane option across both gains and loss frames. The Bayesian interval hypothesis tests reported in Table 3 are the probabilities that each of these parameters positively influence the risk-averse choice. We find a 99.4% chance that perceptions of local government sustainability performance are positively related to risk-aversion in the gains-framing scenario. This result is consistent with the EECBG findings; past performance appears to drive risk-aversion when the scenario is presented as a potential gain. However, when the program is framed in terms of potential losses, we find only a 19.5% chance of observing this effect. We conclude that these finding offer evidence that past performance can bias the assessments of future program participation. Turning to EO, we find only a 63.4% chance that EO is positively related to risk aversion in the gains scenario and an 81% chance in the loss scenario, which we consider inconclusive evidence for H4. Finally, we observe a 23.7% chance that more senior supervisors are more risk-averse under the gains scenario, but we find a 98.7% chance that seniority in an organizational hierarchy positively influences risk-taking in the loss scenario. This suggests the possibility that loss aversion is a weaker cognitive mechanism among higher-level administrators in local governments. However, this could be attributable to either the conditioning from positions which require greater risk-taking or the likelihood that more ambitious, risk-taking individuals self-select into the higher rungs of public organizations.

Table 3. Bayesian Interval Hypothesis Tests for Risk-Aversion

Var.	Interval Hypotheses	Gains Frame	Loss Frame
Performance	($p > 0$)	.994	.195
EO	($p > 0$)	.634	.81
Seniority	($p > 0$)	.237	.014

Discussion and Conclusion

A primary logos of NPM and other government reforms is that the tendencies of *Homo bureaucraticus* can be overcome through indoctrinating or designing entrepreneurialism into public organizations. Loss aversion represents an important cognitive caveat to this creed. EO and the broader notion of entrepreneurialism was imported from the generic management literature (Lumpkin and Dess 1996), and implies that for public organizations to be more risk-taking, innovative, and proactive, they must be willing to accept some losses to achieve overarching goals or greater gains (Meynhardt and Diefenbach 2012; Teske and Schneider 1994). But evidence from prospect theory and its underlying principle of bounded rationality has conclusively demonstrated that loss aversion can bias how individuals contemplate risks versus rewards (Bellé, Cantarelli, and Belardinelli 2018; Kahneman and Tversky 2013). A behavioral theory of collective choice applied to public organizations holds that government officials may be more likely to take risks with public resources when they are confronted with potential losses. The evidence that local governments discounted their direct experiences with EECBG-funded activities when deciding to continue them is consistent with Simon and March's hypothesis (1958) that innovation must overcome the sunk costs which work against abandoning existing programs. Experimental results extend this managerial loss aversion finding to equivalent loss and gains scenarios. At a minimum, the results indicate that reforms designed to engender an organizational EO may not be a panacea for sustainability challenges facing governments globally.

Our study also raises practical considerations for how government officials frame the challenges of sustainability for their communities. Organizations such as ICLEI-Local Governments for Sustainability, the U.S. Conference of Mayors, the International City/County Management Association, the Global Covenant of Mayors for Climate & Energy, and others have spent years, if not decades, organizing and encouraging local governments to take voluntary actions to improve sustainability (Krause 2011; Bai et al. 2018; Homsy and Warner 2015; Portney 2013). Such choices are typically framed around energy efficiency, quality-of-life and other co-benefits, or global environmental benefits which could be achieved from investments in sustainability, and criticized for the potential economic or property-rights losses such commitments could impose (Berry and Portney 2017; Krause, Yi, and Feiock 2016; Yi, Krause, and Feiock 2017). Barriers typically identified include a lack of public engagement, a focus on short-term savings over longer-term benefits, and prohibitive inter-governmental and -sectoral collaboration costs (Deslatte and Feiock 2018; Portney 2005; Zeemering 2014).

However, if local governments are more likely to take risks when facing potential losses, this suggests that sustainability advocacy efforts premised on touting potential societal gains may be wasting an opportunity. Framing sustainability in terms of potential social, economic, and environmental losses which may result from inaction has the potential to motivate greater support for such initiatives. To some extent, this framing is already occurring as the scientific community and media focus communications strategies more on the negative impacts of climate change. For instance, the May 2019 report from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)[1] drew worldwide media and popular attention

[1] https://www.ipbes.net/sites/default/files/downloads/spm_unedited_advance_for_posting_htn.pdf

by highlighting the anthropogenic-induced increase in extinction risks for one million species. Organizations such as the Union of Concerned Scientists, [2] universities,[3] and the media[4] have increased public and stakeholder outreach efforts to link extreme precipitation, flooding, and climate change. In a noteworthy style-change, *The Guardian* newspaper announced in May 2019 it would begin using phrases such as "climate crisis" and "global heating" to emphasis the dire nature of the threat, prompting other news organizations to consider following suit.[5] This indicates that public administration scholars need to direct greater attention to the risk-taking tendencies of local government officials as future infrastructure, ecosystem, social, and economic consequences of climate change are made more salient.

However, this trend also highlights a messaging strategy which goes beyond equivalence framing. *Issue framing*, in which substantively distinct considerations surrounding a policy issue are raised and acted upon (Jacoby 2000), is more commonly used in political science to explore the effects of campaign messaging, elite mobilization, and party competition (Druckman 2004; Slothuus and de Vreese 2010). For instance, one such study on the influence of competing issue frames surrounding a local government growth management initiative -- that it would preserve green space but impose economic costs -- found that citizen exposure to either the strong "pro" or "con" frames via editorials significantly swayed support above or below the mean, respectively (Chong and Druckman 2007).

No studies of which we are aware explore the influence of issue framing on public managers' decision making (Battaglio et al. 2018; Deslatte 2020; Laurian, Walker, and Crawford 2017). This is a surprising omission considering the extent to which local managers are immersed in substantive issue-based arguments for or against the myriad social, environmental, and economic policy problems cities confront (Deslatte, Swann, and Feiock 2017). Much of the effort from state and national governments, international organizations, and policy entrepreneurs to foster greater local government sustainability has hinged on showcasing innovative ideas and framing "success stories" to foster greater policy diffusion (Hawkins et al. 2016; Portney 2013). Future research should direct attention to this omission and examine the effects of positive and negative issue framing on organizational identification, public and stakeholder support.

The limited evidence we find supporting a role for EO in sustainability initiatives also has implications for policy design. Our analysis found an EO only moderates the influence of satisfaction on sustainability program continuation and plays little direct role in decisions to launch new programs. One implication from loss aversion is that local governments may be more likely to make investments to preserve sustainability programs initiated through state or federal

[2] https://www.ucsusa.org/global-warming/global-warming-impacts/floods
[3] https://eri.iu.edu/prepare/webinars.html
[4] https://www.wired.com/story/for-the-midwest-epic-flooding-is-the-face-of-climate-change/
[5] https://www.theguardian.com/environment/2019/may/24/media-outlets-guardian-reconsider-language-climate

initiatives as opposed to instigating them on their own. As previously discussed, this is because the limits on the speed and collective cognitive capacities of organizations make preserving existing programmatic activities more appealing than directing activities toward the creation of new programs (Simon and March 1958).

The decentralized characteristics of U.S.-style fiscal federalism make programs such as EECBG appealing mechanisms from a policy design perspective for stimulating innovation and state and local compliance with national policy goals (Terman 2015; Terman et al. 2016; Wang and Pagano 2017). However, the broader federal stimulus act which authorized EECBG funding was passed by Congress largely along party lines, encountered accountability and transparency challenges (Hall and Jennings 2011; Jennings, Hall, and Zhang 2012), and significant variation across states in implementation timelines and successes (Carley, Nicholson-Crotty, and Fisher 2015). While local-level climate action has been touted by advocacy groups and policy entrepreneurs as a remedy to the U.S. decision to pull out of the 2015 Paris climate accord, loss aversion presents a potential barrier to notions that sub-state actors can go it alone. If more entrepreneurially oriented local governments are no more likely to initiate major strides toward sustainability, local government voluntary actions may not be enough (Portney 2013; Swann 2017). Given the scale and immediacy of climate change threats, the architecture of organizational decision-making suggests future federal initiation of sustainability efforts will be necessary, in much the same way that traditional Community Development Block Grants (CDBG) have evolved into an ongoing inter-governmental program. While there remain significant gaps in our understanding of all that motivates organizational change, the theoretical components of bounded rationality have provided tools for building better institutions to support such future efforts.

Bibliography

Anechiarico, Frank. 2007. “The New Public Management at Middle Age: Critiques of the Performance Movement.” *Public Administration Review* 67 (4): 783–86.

Bai, Xuemei, Richard J. Dawson, Diana Ürge-Vorsatz, Gian C. Delgado, Aliyu Salisu Barau, Shobhakar Dhakal, David Dodman, et al. 2018. “Six Research Priorities for Cities and Climate Change.” *Nature* 555 (7694): 23–25.

Battaglio, R. Paul, Jr., Paolo Belardinelli, Nicola Bellé, and Paola Cantarelli. 2018. “Behavioral Public Administration Ad Fontes: A Synthesis of Research on Bounded Rationality, Cognitive Biases, and Nudging in Public Organizations.” *Public Administration Review* 25 (September): 599.

Baumgartner, Frank R., and Bryan D. Jones. 2015. *The Politics of Information: Problem Definition and the Course of Public Policy in America*. University of Chicago Press.

Belardinelli, Paolo, Nicola Bellé, Mariafrancesca Sicilia, and Ileana Steccolini. 2018. “Framing Effects under Different Uses of Performance Information: An Experimental Study on Public Managers.” *Public Administration Review* 78 (6): 841–51.

Bellé, Nicola, Paola Cantarelli, and Paolo Belardinelli. 2018. “Prospect Theory Goes Public:

Experimental Evidence on Cognitive Biases in Public Policy and Management Decisions." *Public Administration Review* 78 (6): 828–40.
Berinsky, Adam J., Gregory A. Huber, and Gabriel S. Lenz. 2012. "Evaluating Online Labor Markets for Experimental Research: Amazon.com's Mechanical Turk." *Political Analysis: An Annual Publication of the Methodology Section of the American Political Science Association* 20 (3): 351–68.
Berry, Jeffrey M., and Kent E. Portney. 2017. "The Tea Party versus Agenda 21: Local Groups and Sustainability Policies in U.S. Cities." *Environmental Politics* 26 (1): 118–37.
Berry, William D., Matt Golder, and Daniel Milton. 2012. "Improving Tests of Theories Positing Interaction." *The Journal of Politics* 74 (3): 653–71.
Boyne, George A., Kenneth J. Meier, Laurence J. O'Toole, and Richard M. Walker. 2005. "Where Next? Research Directions on Performance in Public Organizations." *Journal of Public Administration Research and Theory* 15 (4): 633–39.
Bozeman, Barry, and Gordon Kingsley. 1998. "Risk Culture in Public and Private Organizations." *Public Administration Review* 58 (2): 109–18.
Brinton Milward, H., and Hal G. Rainey. 1983. "Don't Blame the Bureaucracy!" *Journal of Public Policy* 3 (2): 149–68.
Buhrmester, Michael, Tracy Kwang, and Samuel D. Gosling. 2011. "Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data?" *Perspectives on Psychological Science: A Journal of the Association for Psychological Science* 6 (1): 3–5.
Bullock, Justin B., Robert A. Greer, and Laurence J. O'Toole. 2019. "Managing Risks in Public Organizations: A Conceptual Foundation and Research Agenda." *Perspectives on Public Management and Governance* 2 (1): 75–87.
Cantarelli, Paola, Nicola Belle, and Paolo Belardinelli. 2018. "Behavioral Public HR: Experimental Evidence on Cognitive Biases and Debiasing Interventions." *Review of Public Personnel Administration,* June, 0734371X18778090.
Carley, Sanya, Sean Nicholson-Crotty, and Eric J. Fisher. 2015. "Capacity, Guidance, and the Implementation of the American Recovery and Reinvestment Act." *Public Administration Review* 75 (1): 113–25.
Chong, Dennis, and James N. Druckman. 2007. "Framing Public Opinion in Competitive Democracies." *The American Political Science Review* 101 (4): 637–55.
Clifford, Scott, Ryan M. Jewell, and Philip D. Waggoner. 2015. "Are Samples Drawn from Mechanical Turk Valid for Research on Political Ideology?" *Research & Politics* 2 (4): 2053168015622072.
Cohen, Michael D., James G. March, and Johan P. Olsen. 1972. "A Garbage Can Model of Organizational Choice." *Administrative Science Quarterly* 17 (1): 1–25.
DeHart-Davis, Leisha. 2007. "The Unbureaucratic Personality." *Public Administration Review* 67 (5): 892–903.
Deslatte, Aaron. 2018. "Managerial Friction and Land-Use Policy Punctuations in the Fragmented Metropolis." *Policy Studies Journal: The Journal of the Policy Studies Organization.* https://onlinelibrary.wiley.com/doi/abs/10.1111/psj.12275.
———. 2019. "A Bayesian Approach for Behavioral Public Administration: Citizen Assessments of Local Government Sustainability Performance." *Journal of Behavioral Public Administration* 2 (1): 1–12.
———. 2020. "Revisiting Bureaucratic Entrepreneurialism in the Age of Urban Austerity: Framing Issues, Taking Risks, and Building Collaborative Capacity." In *Urban Studies and*

Entrepreneurship, edited by Muhammad Naveed Iftikhar, Jonathan B. Justice, and David B. Audretsch, 143–59. Cham: Springer International Publishing.

Deslatte, Aaron, and Richard C. Feiock. 2018. "The Collaboration Riskscape: Fragmentation, Problem Types and Preference Divergence in Urban Sustainability." *Publius*, July. https://doi.org/10.1093/publius/pjy020.

Deslatte, Aaron, and William L. Swann. 2016. "Is the Price Right? Gauging the Marketplace for Local Sustainable Policy Tools." *Journal of Urban Affairs* 38 (4): 581–96.

———. 2017. "Context Matters: A Bayesian Analysis of How Organizational Environments Shape the Strategic Management of Sustainable Development." *Public Administration* 95 (3): 807–24.

Deslatte, Aaron, William L. Swann, and Richard C. Feiock. 2017. "Three Sides of the Same Coin? A Bayesian Analysis of Strategic Management, Comprehensive Planning, and Inclusionary Values in Land Use." *Journal of Public Administration Research and Theory* 27 (3): 415–32.

DOE, U. S. 2011. "Energy Efficiency and Conservation Block Grant Recipients Face Challenges Meeting Legislative and Program Goals and Requirements."

Druckman, James N. 2001. "The Implications of Framing Effects for Citizen Competence." *Political Behavior* 23 (3): 225–56.

———. 2004. "Political Preference Formation: Competition, Deliberation, and the (Ir)relevance of Framing Effects." *The American Political Science Review* 98 (4): 671–86.

Favero, Nathan, and Justin B. Bullock. 2015. "How (Not) to Solve the Problem: An Evaluation of Scholarly Responses to Common Source Bias." *Journal of Public Administration Research and Theory* 25 (1): 285–308.

Feeney, Mary K. 2012. "Organizational Red Tape: A Measurement Experiment." *Journal of Public Administration Research and Theory* 22 (3): 427–44.

Fernandes, Ronald, and Herbert A. Simon. 1999. "A Study of How Individuals Solve Complex and Ill-Structured Problems." *Policy Sciences* 32 (3): 225–45.

Fiorino, Daniel J. 2018. *A Good Life on a Finite Earth: The Political Economy of Green Growth*. Oxford University Press.

Funke, Joachim. 2001. "Dynamic Systems as Tools for Analysing Human Judgement." *Thinking & Reasoning* 7 (1): 69–89.

George, B., M. Baekgaard, and A. Decramer. 2018. "Institutional Isomorphism, Negativity Bias and Performance Information Use by Politicians: A Survey Experiment." *Public Administration Review*. https://onlinelibrary-wiley-com.proxyiub.uits.iu.edu/doi/abs/10.1111/padm.12390.

Gerhard, Carla, Andreas G. Klein, Karin Schermelleh-Engel, Helfried Moosbrugger, Jana Gäde, and Holger Brandt. 2015. "On the Performance of Likelihood-Based Difference Tests in Nonlinear Structural Equation Models." *Structural Equation Modeling: A Multidisciplinary Journal* 22 (2): 276–87.

Gilad, Sharon, Pazit Ben-Nun Bloom, and Michaela Assouline. 2018. "Bureaucrats' Processing of Organizational Reputation Signals." *Journal of Behavioral Public Administration* 1 (1). https://doi.org/10.30636/jbpa.11.11.

Grimmelikhuijsen, Stephan G., and Albert J. Meijer. 2012. "Effects of Transparency on the Perceived Trustworthiness of a Government Organization: Evidence from an Online Experiment." *Journal of Public Administration Research and Theory* 24 (1): 137–57.

Grimmelikhuijsen, Stephan, Sebastian Jilke, Asmus Leth Olsen, and Lars Tummers. 2017.

"Behavioral Public Administration: Combining Insights from Public Administration and Psychology." *Public Administration Review* 77 (1): 45–56.

Grosso, Ashley, Étienne Charbonneau, and Gregg G. Van Ryzin. 2017. "How Citizens Respond to Outputs, Outcomes, and Costs: A Survey Experiment About an HIV/AIDS Program." *International Public Management Journal* 20 (1): 160–81.

Guiso, Luigi, and Monica Paiella. 2008. "Risk Aversion, Wealth, and Background Risk." *Journal of the European Economic Association* 6 (6): 1109–50.

Hall, Jeremy L., and Edward T. Jennings. 2011. "The American Recovery and Reinvestment Act (ARRA) a Critical Examination of Accountability and Transparency in the Obama Administration." *Public Performance & Management Review* 35 (1): 202–26.

Hawkins, Christopher V., Rachel M. Krause, Richard C. Feiock, and Cali Curley. 2016. "Making Meaningful Commitments: Accounting for Variation in Cities' Investments of Staff and Fiscal Resources to Sustainability." *Urban Studies* 53 (9): 1902–24.

Hendren, Kathryn, Qian Eric Luo, and Sanjay K. Pandey. 2018. "The State of Mixed Methods Research in Public Administration and Public Policy." *Public Administration Review* 78 (6): 904–16.

Homsy, George C., and Mildred E. Warner. 2015. "Cities and Sustainability: Polycentric Action and Multilevel Governance." *Urban Affairs Review* 51 (1): 46–73.

Ingraham, Patricia Wallace. 2005. "Performance: Promises to Keep and Miles to Go." *Public Administration Review* 65 (4): 390–95.

James, Oliver, Sebastian R. Jilke, and Gregg G. Van Ryzin. 2017. *Experiments in Public Management Research: Challenges and Contributions*. Cambridge University Press.

Jennings, Edward T., Jeremy L. Hall, and Zhiwei Zhang. 2012. "The American Recovery and Reinvestment Act and State Accountability." *Public Performance & Management Review* 35 (3): 527–49.

Jilke, Sebastian, Gregg G. Van Ryzin, and Steven Van de Walle. 2016. "Responses to Decline in Marketized Public Services: An Experimental Evaluation of Choice Overload." *Journal of Public Administration Research and Theory* 26 (3): 421–32.

Jones, Bryan D. 1994. *Reconceiving Decision-Making in Democratic Politics: Attention, Choice, and Public Policy*. University of Chicago Press.

———. 2001. *Politics and the Architecture of Choice: Bounded Rationality and Governance*. University of Chicago Press.

———. 2002. "Bounded Rationality and Public Policy: Herbert A. Simon and the Decisional Foundation of Collective Choice." *Policy Sciences* 35 (3): 269–84.

———. 2003. "Bounded Rationality and Political Science: Lessons from Public Administration and Public Policy." *Journal of Public Administration Research and Theory* 13 (4): 395–412.

Jones, Bryan D., and Peter B. Mortensen. 2018. "Punctuated Equilibrium Eory: Explaining Stability and Change in Public Policymaking, Frank R. Baumgartner." In *Theories of the Policy Process*, 65–112. Routledge.

Kahneman, Daniel, and Patrick Egan. 2011. *Thinking, Fast and Slow*. Vol. 1. Farrar, Straus and Giroux New York.

Kahneman, Daniel, and Amos Tversky. 1986. "Rational Choice and the Framing of Decisions." *Journal of Business* 59 (4): 251–78.

Kahneman, D., and A. Tversky. 2013. "Prospect Theory: An Analysis of Decision under Risk." *Handbook of the Fundamentals of Financial*. https://www.worldscientific.com/doi/abs/10.1142/9789814417358_0006.

Kearney, Claudine, and Timo Meynhardt. 2016. "Directing Corporate Entrepreneurship Strategy in the Public Sector to Public Value: Antecedents, Components, and Outcomes." *International Public Management Journal* 19 (4): 543–72.

Kettl, Donald F. 2016. *Escaping Jurassic Government: How to Recover America S Lost Commitment to Competence*. Brookings Institution Press.

Kim, Younhee. 2010. "Stimulating Entrepreneurial Practices in the Public Sector: The Roles of Organizational Characteristics." *Administration & Society* 42 (7): 780–814.

Kim, Y., and M. E. Warner. 2016. "Pragmatic Municipalism: Local Government Service Delivery after the Great Recession." *Public Administration*. http://onlinelibrary.wiley.com/doi/10.1111/padm.12267/full.

Kingdon, John W., and James A. Thurber. 1984. *Agendas, Alternatives, and Public Policies*. Vol. 45. Little, Brown Boston.

Klein, Andreas, and Helfried Moosbrugger. 2000. "Maximum Likelihood Estimation of Latent Interaction Effects with the LMS Method." *Psychometrika* 65 (4): 457–74.

Krause, Rachel M. 2011. "Symbolic or Substantive Policy? Measuring the Extent of Local Commitment to Climate Protection." *Environment and Planning. C, Government & Policy* 29 (1): 46–62.

Krause, Rachel M., Hongtao Yi, and Richard C. Feiock. 2016. "Applying Policy Termination Theory to the Abandonment of Climate Protection Initiatives by U.S. Local Governments." *Policy Studies Journal: The Journal of the Policy Studies Organization* 44 (2): 176–95.

Laurian, Lucie, Mark Walker, and Jan Crawford. 2017. "Implementing Environmental Sustainability in Local Government: The Impacts of Framing, Agency Culture, and Structure in US Cities and Counties." *International Journal of Public Administration* 40 (3): 270–83.

Lee, Danbee, and Gregg G. Van Ryzin. 2018. "Bureaucratic Reputation in the Eyes of Citizens: An Analysis of US Federal Agencies." *International Review of Administrative Sciences*, June, 0020852318769127.

Lewis, Gregory B., and Sue A. Frank. 2002. "Who Wants to Work for the Government?" *Public Administration Review* 62 (4): 395–404.

Lumpkin, G. T., and Gregory G. Dess. 1996. "Clarifying the Entrepreneurial Orientation Construct and Linking It To Performance." *AMRO* 21 (1): 135–72.

Maslowsky, Julie, Justin Jager, and Douglas Hemken. 2015. "Estimating and Interpreting Latent Variable Interactions: A Tutorial for Applying the Latent Moderated Structural Equations Method." *International Journal of Behavioral Development* 39 (1): 87–96.

Meier, Kenneth J., Nathan Favero, and Ling Zhu. 2015. "Performance Gaps and Managerial Decisions: A Bayesian Decision Theory of Managerial Action." *Journal of Public Administration Research and Theory* 25 (4): 1221–46.

Mele, Valentina, and Paolo Belardinelli. 2018. "Mixed Methods in Public Administration Research: Selecting, Sequencing, and Connecting." *Journal of Public Administration Research and Theory*, August. https://doi.org/10.1093/jopart/muy046.

Merton, Robert K. 1939. "Bureaucratic Structure and Personality." *Soc. F.* 18: 560.

Meynhardt, Timo, and Fabian E. Diefenbach. 2012. "What Drives Entrepreneurial Orientation in the Public Sector? Evidence from Germany's Federal Labor Agency." *Journal of Public Administration Research and Theory* 22 (4): 761–92.

Morris, Michael H., and Foard F. Jones. 1999. "Entrepreneurship in Established Organizations: The Case of the Public Sector." *Entrepreneurship Theory and Practice* 24 (1): 71–91.

Moynihan, Donald. 2018. “A Great Schism Approaching? Towards a Micro and Macro Public Administration.” *Journal of Behavioral Public Administration* 1 (1). https://doi.org/10.30636/jbpa.11.15.
Muthén, Bengt, and Tihomir Asparouhov. 2012. “Latent Variable Interactions.” *Unpublished Manuscript. Retrieved. http://statmodel2. com/download/Latent% 20variable% 20interactions. Pdf*. http://www.statmodel.com/download/LVinteractions.pdf.
Muthñn, L. K., and B. O. Muthñn. 2012. “Mplus User’s Guide.” *Seventh. Los Angeles, CA: Muthén & Muthén*.
Newell, Allen, and H. A. Simon. 1988. “The Theory of Human Problem Solving.” *Readings in Cognitive Science*. https://doi.org/10.1016/b978-1-4832-1446-7.50009-1.
Nicholson-Crotty, Sean, Jill Nicholson-Crotty, and Sean Webeck. 2019. “Are Public Managers More Risk Averse? Framing Effects and Status Quo Bias across the Sectors.” *Journal of Behavioral Public Administration* 2 (1). https://doi.org/10.30636/jbpa.21.35.
Nicholson-Crotty, S., and J. Nicholson-Crotty. 2017. “Performance and Management in the Public Sector: Testing a Model of Relative Risk Aversion.” *Public Administration*. https://onlinelibrary.wiley.com/doi/abs/10.1111/puar.12619.
Olsen, Asmus Leth. 2015. “Citizen (Dis)satisfaction: An Experimental Equivalence Framing Study.” *Public Administration Review* 75 (3): 469–78.
Olsen, Asmus Leth, Lars Tummers, Stephan Grimmelikhuijsen, and Sebastian Jilke. 2018. “Behavioral Public Administration: Connecting Psychology with European Public Administration Research.” *The Palgrave Handbook of Public Administration and Management in Europe*. https://doi.org/10.1057/978-1-137-55269-3_57.
Opp, S. M., and K. L. Saunders. 2013. “Pillar Talk: Local Sustainability Initiatives and Policies in the United States—finding Evidence of the ‘three E’s’: Economic Development, Environmental Protection, and Social Equity.” *Urban Affairs Review* . http://journals.sagepub.com/doi/abs/10.1177/1078087412469344.
Osborne, David, and Ted Gaebler. 1992. “Reinventing Government: How the Entrepreneurial Spirit Is Transforming Government.” *Reading Mass. Adison Wesley Public Comp*.
O’Toole, Laurence J., Jr, and Kenneth J. Meier. 2014. “Public Management, Context, and Performance: In Quest of a More General Theory.” *Journal of Public Administration Research and Theory* 25 (1): 237–56.
O’Toole, Laurence J., and Kenneth J. Meier. 1999. “Modeling the Impact of Public Management: Implications of Structural Context.” *Journal of Public Administration Research and Theory* 9 (4): 505–26.
Park, Angela, Rachel M. Krause, and Richard C. Feiock. 2018. “Does Collaboration Improve Organizational Efficiency? A Stochastic Frontier Approach Examining Cities’ Use of EECBG Funds.” *Journal of Public Administration Research and Theory*. https://academic.oup.com/jpart/advance-article-abstract/doi/10.1093/jopart/muy078/5266901.
Pfeifer, Christian. 2010. “Risk Aversion and Sorting into Public Sector Employment.” *German Economic Review* 2 (February): 239.
Piotrowski, Suzanne, Stephan Grimmelikhuijsen, and Felix Deat. 2017. “Numbers over Narratives? How Government Message Strategies Affect Citizens’ Attitudes.” *Public Performance & Management Review*, 1–24.
Portney, Kent. 2005. “Civic Engagement and Sustainable Cities in the United States.” *Public Administration Review* 65 (5): 579–91.

Portney, Kent E. 2013. *Taking Sustainable Cities Seriously: Economic Development, the Environment, and Quality of Life in American Cities*. MIT Press.
Redelmeier, Donald A., Joel Katz, and Daniel Kahneman. 2003. "Memories of Colonoscopy: A Randomized Trial." *Pain* 104 (1-2): 187–94.
Rutherford, Amanda, and Kenneth J. Meier. 2015. "Managerial Goals in a Performance-Driven System: Theory and Empirical Tests in Higher Education." *Public Administration* 93 (1): 17–33.
Simon, Herbert A. 1991. "Bounded Rationality and Organizational Learning." *Organization Science* 2 (1): 125–34.
———. 1996. *The Sciences of the Artificial*. MIT Press.
Simon, Herbert, and J. G. March. 1958. "Organization." *N. -Y*. https://tech.msu.edu/wp-content/uploads/2017/10/ITServicesPage1OrgChart-for-October-12.pdf.
Singla, Akheil, Justin M. Stritch, and Mary K. Feeney. 2018. "Constrained or Creative? Changes in Financial Condition and Entrepreneurial Orientation in Public Organizations." *Public Administration* 96 (4): 769–86.
Slothuus, Rune, and Claes H. de Vreese. 2010. "Political Parties, Motivated Reasoning, and Issue Framing Effects." *The Journal of Politics* 72 (3): 630–45.
Swann, William L. 2017. "Modelling the Relationship between Entrepreneurial Orientation, Organizational Integration, and Programme Performance in Local Sustainability." *Public Management Review* 19 (4): 542–65.
Swann, William L., and Aaron Deslatte. 2018. "What Do We Know about Urban Sustainability? A Research Synthesis and Nonparametric Assessment." *Urban Studies* , July, 0042098018779713.
Tepe, Markus, and Christine Prokop. 2018. "Are Future Bureaucrats More Risk Averse? The Effect of Studying Public Administration and PSM on Risk Preferences." *Journal of Public Administration Research and Theory* 28 (2): 182–96.
Terman, Jessica N. 2015. "Performance Goal Achievement in Fiscal Federalism: The Influence of State Partisan Environments and Regulatory Regimes." *Policy Studies Journal: The Journal of the Policy Studies Organization* 43 (3): 333–54.
Terman, Jessica N., and Richard C. Feiock. 2015. "Improving Outcomes in Fiscal Federalism: Local Political Leadership and Administrative Capacity." *Journal of Public Administration Research and Theory* 25 (4): 1059–80.
Terman, Jessica N., Anthony Kassekert, Richard C. Feiock, and Kaifeng Yang. 2016. "Walking in the Shadow of Pressman and Wildavsky: Expanding Fiscal Federalism and Goal Congruence Theories to Single-Shot Games." *The Review of Policy Research* 33 (2): 124–39.
Teske, Paul, and Mark Schneider. 1994. "The Bureaucratic Entrepreneur: The Case of City Managers." *Public Administration Review* 54 (4): 331–40.
Thaler, Richard H., and L. J. Ganser. 2015. *Misbehaving: The Making of Behavioral Economics*. WW Norton New York.
Tversky, A., and D. Kahneman. 1981. "The Framing of Decisions and the Psychology of Choice." *Science*. http://science.sciencemag.org/content/211/4481/453.short.
Wang, Shu, and Michael A. Pagano. 2017. "Cities and Fiscal Federalism in the Trump Era: A Discussion." *State and Local Government Review* 49 (3): 184–98.
Yi, H., R. M. Krause, and R. C. Feiock. 2017. "Back-Pedaling or Continuing Quietly? Assessing the Impact of ICLEI Membership Termination on Cities' Sustainability Actions."

Environmental Politics. http://www.tandfonline.com/doi/abs/10.1080/09644016.2016.1244968.

Zeemering, E. S. 2014. "Collaborative Strategies for Sustainable Cities: Economy, Environment and Community in Baltimore." https://www.taylorfrancis.com/books/9781135130763.