9-18-2021

Public Preferences for Disaster Federalism: Comparing Public Risk Management Preferences Across Levels of Government and Hazards

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Recommended Citation

Wesley Wehde and Junghwa Choi (2021). Public Preferences for Disaster Federalism: Comparing public risk management preferences across levels of government and hazards. Public Administration Review, 82(4) 733-746. https://doi.org/10.1111/puar.13432

Public Preferences for Disaster Federalism: Comparing Public Risk Management Preferences Across Levels of Government and Hazards

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Abstract:

Despite a general lack of political knowledge among the public, research demonstrates that individuals intuitively know which level of government should be, and sometimes is, responsible for policy problems. In this article, we look at public federalism preferences in the context of disaster management, particularly for managing the risks associated with three different types of hazards—specifically global warming, earthquakes, and wildfires—and examine if their preferences are aligned with the division of responsibility in disaster management. Using survey data from Oklahoma, we find that individuals appropriately match their preferences to the intergovernmental nature of disaster federalism in the United States. Additionally, knowing the causes of these hazards is strongly associated with a preference for the appropriate, to disaster scope and scale, level of government. Finally, using seemingly unrelated regression techniques, we find that many, but not all, relationships are hazard general while some are hazard specific.

Evidence for Practice

• Members of the public seem to possess nuanced “intuitive federalism,” recognizing the intergovernmental nature of disaster management.

• The public’s “intuitive federalism” extends to preferring the level of government more appropriate for the scope and scale of managing certain disasters, specifically wildfires and earthquakes.

• Public education campaigns focused on hazards’ causes, not risk perceptions, may increase support for the appropriate, defined by typical disaster scope and scale, level of government.

Scholars have previously argued that the public does not have strong views on the federal system in the United States or other countries such as Canada (Cantril and Cantril 1999; Cutler 2008). This may not be surprising, given the public's lack of political knowledge (Page and Shapiro 1992; Price 1999). However, a more recent body of research has found that the public can differentiate between the responsibilities of the levels of government in a federal system (Arceneaux 2005; Konisky 2011; Schneider and Jacoby 2013). This body of scholarship has demonstrated that individuals have "intuitive federalism" (Arceneaux 2005; Schneider and Jacoby 2013). Intuitive federalism is the idea individuals develop preferences for which level of government should be responsible for policy problems without necessarily being politically knowledgeable (Schneider and Jacoby 2013). Scholars have also found that public preferences for federalism may be shaped by demographics, political dispositions, and problem definitions (Dinan and Heckelman 2020; Schneider 2008; Wehde and Nowlin 2021).

In this article, we explore public federalism preferences for three hazards and if these preferences match the reality of policy provision. Furthermore, we seek to analyze the determinants of individual federalism preferences, in the understudied context of disaster management. Previous work in this domain has either looked at disaster management generally (Schneider 2008) or at singular hazards (Choi and Wehde 2019). We build on this work by comparing federalism preferences across multiple hazards. Comparing preferences across hazards is important as previous research has demonstrated that hazard characteristics help explain public attitudes and beliefs (Choi and Wehde 2020; Robinson, Stoutenborough, and Vedlitz 2017). Additionally, while others have focused on delineating policies and public preferences across levels of government, we argue that policy is often actually provided through intergovernmental collaboration. The measurement strategies of previous research on intuitive federalism preclude examining the possibility that individual members of the public recognize that multiple levels of government are responsible for disaster management. We improve upon this research by examining data that allow for respondents to report their level of preference for both state and federal policy intervention.

Specifically, our survey of Oklahomans suggests that a plurality of respondents intuitively match their preferences to the reality of intergovernmental disaster federalism in the United States. Additionally, the distribution of public federalism preferences differs slightly across hazards in intuitive ways. For hazards with larger geographic scopes, such as global warming, the public prefers federal government intervention while for hazards with smaller geographic scopes, such as wildfires and earthquakes, the public prefers state government intervention. Furthermore, using seemingly unrelated regression (SUR), which allows for direct comparisons across hazards, we find a nuanced relationship between individual characteristics and federalism preference. While age, gender, and risk perception have consistent relationships with federalism preferences across all three hazards, other factors such as beliefs about causality or ideology vary in their relationships with federalism preferences across the hazards. In

the following article, we proceed by describing the federal system in the context of disaster management in the United States. We then describe relevant hazard characteristics and review previous research on federalism preference determinants. Next, we describe the Oklahoma Weather, Society and Government Survey conducted in the spring and summer of 2018 and present our results from descriptive and SUR analyses. Finally, we conclude with a discussion of the theoretical and practical implications of our research for future studies of disaster federalism and management.

Intuitive Federalism in Disaster Management

The concept of intuitive federalism implies that individuals intuitively hold and develop preferences for different levels of government, irrespective of whether they understand the political and policy realm. Individuals understand these distinctive responsibilities through their daily experiences (Schneider and Jacoby 2013). For example, people tend to believe state and local governments are responsible for policy areas such as economic development but that immigration should be addressed by the federal government (Schneider, Jacoby, and Lewis 2011). Furthermore, research on intuitive federalism has demonstrated that individual federalism preferences often match the actual reality of policy service provision (Schneider, Jacoby, and Lewis 2011).

The existence of intuitive federalism is especially interesting in domains where jurisdictional mismatch occurs. Jurisdictional mismatch refers to when regulatory governance could be more efficient at a different level of government (Adler 2005). For instance, it has been argued that more overarching federal, or even transnational, efforts are required to address global warming (Stoddart, Tindall, and Greenfield 2012). However, global warming federalism in the United States, primarily under Republican presidents, has largely moved in the opposite direction with a limited role for the federal government and state and local governments dominant (Adler 2005; Samet and Woodward 2018; see Kettl 2020 for a similar phenomenon regarding COVID-19). Many states are individually pursuing more aggressive policies to reduce emissions and establish stricter standards than those required by the federal government (Samet and Woodward 2018). Thus, the intuitive, in intuitive federalism, refers to both the reality of policy and an understanding of the scope of policy problems; that is, even when federalism results in jurisdictional mismatch, the public may prefer the level of government more appropriate for the problem scale. Following this argument, we seek to answer our first question as follows:

> RQ1: Which level of government, between federal and state, does the public prefer to manage risks associated with hazards? Do their preferences match the actual provision of disaster management policy programs?

Federalism and Disaster Management in the United States

To answer the questions mentioned earlier, it is necessary to understand disaster federalism in the United States. Disaster management[1] in the United States is often categorized into four phases including mitigation, preparedness, response, and

recovery.[2] During these four phases, different levels of government and their agencies collaborate and cooperate to manage emergencies and disasters effectively. Therefore, disaster management is an intergovernmental function.

Previous research has extensively documented how disaster management in the federal system of the United States is supposed to proceed versus how it actually proceeds (Birkland and DeYoung 2011; Landy 2008). If an emergency becomes large enough and the local governments cannot solely address the situation, this emergency turns into a disaster and response efforts will necessitate involvement from state-level actors. At this stage, most governors have significant discretion in declaring a state of emergency and mobilizing and coordinating resources for the local governments. If the capacity of local and state governments together is exhausted, the governor may request for a disaster declaration from the president. The president can, if deemed necessary, approve the disaster declaration. This opens the doors to a variety of federal funding sources for state and local levels that would otherwise be unavailable (Birkland and DeYoung 2011). State and local governments then may utilize the resources and funding from the federal government to respond to and recover from the current disaster. This federal support allows state and local government to mitigate similar disasters in the future and be prepared to prevent emergencies from becoming disasters.

It should be noted that the involvement of higher-level governments does not mean that they completely replace the role of the lower levels of governments. Instead, different levels of government simultaneously work together as partners in coordination and collaboration in disaster management (Schneider 2008). More specifically, during the response phase, disaster management actors from different levels of government and potentially different sectors utilize an Incident Command System as a part of the National Incident Management system (NIMS).[3] NIMS provides structures and processes that facilitate the effective collaboration among various actors from different levels of government, agencies, and jurisdictions to prepare for and respond to major emergencies and disasters (Lester and Krejci 2007). This system is not a hierarchical system with one actor or level at the top and others as subordinates but rather a highly centralized network system (Lester and Krejci 2007).

Most research has focused on intergovernmental coordination in the response and, to a lesser extent, recovery stages of the disaster cycle. However, Birkland and Waterman (2008) described how the Stafford Act intended to promote intergovernmental relations for preparedness and mitigation as well. Under these programs, certain states emerged as leaders in mitigation in what were intended to be federal-state partnerships (Birkland 2006). The primary mechanism of intergovernmental relations for these stages is funding: the federal government makes funds available through certain programs such as the Hazard Mitigation Grant Program to states and localities that comply with planning incentives and other regulations.

As stated earlier, local and state governments, in general, take the lead in disaster management and the federal government primarily assists them by providing technology and other resources: the federal government is not expected to take initiative, especially in response and recovery phases (Birkland and DeYoung 2011; Landy 2008). However, the 9/11 attacks in 2001 brought some changes to the role of the federal government in disaster management (White House 2003). Previously the federal government was involved in disaster management only when the state and local governments had exhausted their resources and requested assistance. However, since the 9/11 attacks, the federal government may take more proactive and command roles in disaster management when incidents that have nation-wide impacts such as mass casualties, damages, or disruption occur (Schneider 2008; White House 2003). Importantly, recent research on the COVID-19 pandemic suggests federal systems are more agile than unitary systems in the disaster response stage (Bel, Gasulla, and Mazaira-Font 2021).

Consequently, all levels of government are involved in disaster management; however, which government dominates or leads depends on the situation and phase. Primarily, local and state governments lead while the federal government assists. The role of the federal government is particularly limited at the beginning of the disaster response and recovery phases; however, the federal government is expected to become more involved when the scale of disasters exceeds local and state capacities. During the mitigation and preparedness phases, state and local governments must take the initiative to utilize funding from the federal government to develop and implement programs specific to their locality. Based on the federal system in disaster management in the United States and the assumptions of intuitive federalism, we reach our first expectation as follows:

> Expectation 1: Respondents will equally prefer both state and federal governments to be involved in hazard risk management policy.[4]

Public Federalism Preferences and Hazard Characteristics

For most hazards, there exists a robust literature on policy preferences and to some extent federalism preferences (Maestas et al. 2020; Schneider 2008). For instance, Choi and Wehde (2019) found that individuals prefer state, over federal, government to mitigate the risks associated with earthquakes in Oklahoma. Schneider (2008) also explored how the public attributes responsibilities to different levels of government for addressing natural hazards. However, most of this work looks at a specific hazard and scholars have not compared how public preferences for disaster federalism, and predictors thereof, are systemically similar or different across hazards.

Existing research finds that public attitudes toward government and policies vary depending on the hazard examined (Choi and Wehde 2020; Robinson, Stoutenborough, and Vedlitz 2017). This is because hazards' differences in terms of scale and causality lead to different experiences, which in turn affects individual perceptions and attitudes

toward government and their policies (Coombs and Holladay 2005; Weiner 2006). It is, therefore, reasonable to expect that public preferences regarding disaster federalism may vary across different hazards. Thus, we examine three hazards: global warming, earthquakes, and wildfires. We chose these three hazards for a couple of reasons. First, they share some similarities; however, they are significantly different in terms of scope and scale. Furthermore, these are some of the most prevailing natural hazards in Oklahoma, the state for which we have data. Earthquakes and wildfires have significantly damaged properties and the environment as well as threatened human lives in Oklahoma (Weir, Reid, and Fuhlendorf 2012; Wu et al. 2017). Global warming and its associated negative effects have been observed across the United States, including Oklahoma (Gray et al. 2019). By looking at three different hazards that are salient in the state, we expect to examine how different types of hazards may shape federalism preferences for disaster management. Table 1 provides a succinct comparison of these three hazards.

From Table 1, we can see that the characteristics of earthquakes and wildfires, in particular their geographic scope and timescale, on average lead to responses and preparation primarily at the state level. Additionally, this generally fits how these hazards are managed, except in the most disastrous cases where the effects exceed local or state capacity. Thus, under the assumption the public intuitively understands the responsibilities of different levels of government and their preferences often match the reality, it is reasonable to expect the public may prefer the state government for earthquake and wildfire risk management policy. Next, despite jurisdictional mismatch (Adler 2005), the public may prefer federal government global warming risk management policy because of the scope and scale of the hazard. Therefore, we hypothesize hazard-specific federalism preferences as follows:

Expectation 2-1: Federalism preferences will be hazard specific.

Expectation 2-2: Federalism preferences for earthquake risk management policy and wildfire risk management policy will be more similar than either hazard compared to global warming.

Expectation 2-3: On average, respondents will prefer the federal government relative to the state government for global warming risk management policy. 736 Public Administration Review • July | August 2022

Expectation 2-4: On average, respondents will prefer the state government relative to the federal government for earthquake risk management policy.

Expectation 2-5: On average, respondents will prefer the state government relative to the federal government for wildfire risk management policy.

Table 1 Comparison of Hazards across Multiple Dimensions

	Earthquakes	Wildfires	Global Warming
Causality	Mostly human in Oklahoma*	Mostly human	Mostly human
Geographic scope	Local, sub-regional	Local, regional	Global
Predictability	No	Somewhat	Yes
Timescale	Short, usually seconds to minutes**	Medium, days to months	Long, decades

*Although earthquakes are generally known as a geophysical natural hazard, scientists report that a majority of earthquakes in Oklahoma have been heavily triggered by the injection of wastewater produced by oil and gas companies (Choi and Wehde 2019). Therefore, we see earthquakes in Oklahoma as a human-induced hazard.
**See https://www.usgs.gov/faqs/what-difference-between-aftershocks-and-swarms?qt-news_science_products=0#qt-news_science_products.

Determinants of Public Preference for Disaster Federalism

Existing literature suggests that the public largely matches policy areas to the correct level of government and their preferences for federalism match the actual federal system. This research has also demonstrated that certain individual characteristics are related to differences in intuitive federalism beliefs (Schneider, Jacoby, and Lewis 2011). Therefore, we ask:

> RQ2: What individual factors are (not) consistently associated with federalism preferences across multiple hazards?

Some scholars have focused on how political beliefs moderate intuitive federalism preferences. Scholars have shown that Republicans and conservatives have slightly higher preferences for state and local governments, relative to their Democratic and Liberal counterparts, across a variety of policy areas (Dinan and Heckelman 2020; Schneider, Jacoby, and Lewis 2011). Ideology (more conservative) has been shown to be consistently related to a relative preference for state/local policy over federal policy (Konisky 2011; Wehde and Nowlin 2021). Based on these arguments, we hypothesize as follows:

> Expectation 3-1: Republicans will prefer state over federal hazard risk management policy for global warming, earthquakes, and wildfire.

> Expectation 3-2: Conservative ideology will be associated with preferences for state policy over federal policy.

Just as broad political beliefs help explain venue preferences, so do issue-specific characteristics. This research has drawn on work from policy process theory to demonstrate how individual problem definitions are related to policy and venue preferences (Choi and Wehde 2019; Liu, Robinson, and Vedlitz 2020). Problem definition refers to how individuals define the issues they face and includes dimensions such as issue image (how risky/beneficial the issue is, frequency of issue), issue scope or ownership (level of effect or policy authority), and issue causality (Baumgartner and Jones 2010; Rochefort and Cobb 1993). Choi and Wehde (2019) found that issue causality, specifically believing earthquakes in Oklahoma are manmade, is strongly associated with a preference for state over federal policy. Maestas et al. (2020) found that risk perceptions, an element of issue image and problem definition, are positively associated with a preference for uniform regulation and federal, as opposed to the state, control. For global warming, a meta-analysis of over 170 studies concludes that causal beliefs about climate change are consistently related to multiple outcomes, including policy support (Hornsey et al. 2016). A related line of research suggests that respondents tend to seek characteristics (e.g., causality or scope of the issue) of problems first and then match them to the acceptable solutions (Coombs and Holladay 2005; Weiner 2006). Based on these findings and arguments, it is reasonable to expect that issue causality of hazards may lead to changes in individual preferences for government responsibilities. However, problem definition is unique to each problem and hazard, thus the directions of these relationships may vary depending on the domain. Therefore, we explore broader expectations rather than specify directionality as follows:

> Expectation 4: Problem definition will be associated with federalism preferences for all three hazards.
>
> Expectation 4-1: Risk perceptions, as an element of issue image, will be associated with federalism preferences for all three hazards.
>
> Expectation 4-2: Beliefs about future frequency, as an element of issue image, will be associated with federalism preferences for all three hazards.
>
> Expectation 4-3: Issue causality, specifically human causes, will be associated with federalism preferences for all three hazards.

Finally, work on venue preferences has examined issue-specific characteristics. Issue-specific characteristics generally indicate respondents' attention to the specific issues and knowledge about them (Liu, Robinson, and Vedlitz 2020). In studies of hazard policy preferences, one of the most important issues specific characteristics is previous experience. Findings on previous experience are mixed. Some find null effects (Bechtel and Mannino 2019). Others find the experience is associated with positive expectations and evaluations of the federal government (Darr, Cate, and Moak 2019). Others find the experience is associated with less blame for state and local governments (Gomez and Wilson 2008). Although it is clear previous experience

matters in policy and venue preferences, the direction and magnitude of this relationship are uncertain.

> Expectation 5: Previous experience will be associated with a federalism preference for all three hazards.

Data and Methods

The data used for this study were collected as a part of a larger project for which the details can be found in Jenkins-Smith et al. (2017). The sample was collected through a complex process using an address-based sample of the population of Oklahoma with oversamples for certain areas. Respondents were initially contacted by phone or mail for recruitment; subsequent surveys were conducted by either phone or online. Jenkins-Smith et al.'s (2017) documentation of retention and response rates for the first 13 waves of the project suggest reasonable response rates given the complexity of the task. In this study, we rely on data from wave 17, collected March–May 2018, and wave 18, collected June–July 2018. We use variables measuring partisanship and ideology that were collected in wave 17 as these questions were asked once a year. All other variables come from wave 18. Table 2 presents question wording for key variables.

We use the variables as reported in this table except for the last two which form our dependent variable. To measure relative federalism preferences, we subtract the measure for state government involvement from the measure for federal government involvement for each of the three hazards. Thus, the resulting variable is equal to negative 10 for an individual who wants state government extremely involved and federal government not at all involved in addressing the risks of a particular hazard. On the other hand, a score of positive 10 suggests the individual wants the federal government extremely involved and the state government not at all involved. Summary statistics of all variables used in analysis are presented in Table 3, as well as answers to RQ1.

Table 3 suggests approximately 19 percent of respondents experienced a wildfire in the spring while 32 percent experienced an earthquake. About 42 percent of our respondents are male and just under 60 percent believe greenhouse gas emissions are causing global warming. Risk perceptions for all three hazards are approximately at the middle of the scale with global warming evoking the most risk (6.0), followed closely by earthquakes (5.9) and then by wildfires (4.1). Finally, examining our dependent variables and answering RQ1, we find that on average respondents prefer, slightly, the state government to be involved in addressing earthquake and wildfire risks and the federal government to be involved in addressing global warming risks. For all three dependent variables, though the relative preferences are slight, the means are statistically different from zero. We also find that no individual wants the federal government extremely involved and the state government not at all involved for any of the three hazards. Effectively, if respondents want some federal involvement, they also

want some state involvement. Figure 1 illustrates the full distributions for each of these variables.

Table 2 Measurement of Key Variables

Variable	Question Wording	Measurement
Ideology	On a scale of political ideology, individuals can be arranged from strongly liberal to strongly conservative. Which of the following categories best describes your views?	1—Strongly liberal 2—Liberal 3—Slightly liberal 4—Middle of the road 5—Slightly conservative 6—Conservative 7—Strongly conservative
Education	What is the highest level of education that you have *completed?*	1—Less than high school 2—High school graduate/GED 3—Vocational or technical training 4—Some college 5—2-year/Associate's degree 6—4-year/Bachelor's degree 7—Master's degree 8—PhD/JD (Law)/MD
Global warming cause	In your view, are greenhouse gases, such as those resulting from the combustion of coal, oil, natural gas, and other materials, causing average global temperatures to rise?	0—No 1—Yes
Global warming risk perceptions	On a scale from zero to 10, where zero means *no risk* and 10 means *extreme risk*, how much risk do you think global warming poses for people and the environment?	0—No risk … 10—Extreme risk
Global warming effects	In your view, is global warming causing the weather patterns in Oklahoma to change?	0—No 1—Yes 2—Do not know
Wildfire risk perceptions	On a scale from zero to 10, where zero means *no risk* and 10 means *extreme risk*, how much risk do you think wildfires pose to people and structures on your property?	0—No risk … 10—Extreme risk
Wildfire cause	To the best of your knowledge, what causes most of the wildfires that we experience in Oklahoma?	0—Lightning or other natural causes 1—Recoded to include all human causes: arson, industrial accidents, prescribed burns that escape and spread, accidents starting from BBQs, campfires, cigarettes, car mufflers, etc.
Past experience: wildfire and earthquake	*This spring*, have you experienced any of the following kinds of events in the area around where you live? Please indicate all that apply	0—No 1—Yes
Future experience: wildfire and earthquake	Looking to the future and again thinking about the area around where you live, do you think that the following kinds of events will happen more frequently, less frequently, or with about the same frequency over the *next few springs* as they have *this spring*?	3—More frequently 2—With about the same frequency (reference category) 1—Less frequently
Earthquake risk perceptions	On a scale from zero to 10, where zero means *no risk* and 10 means *extreme risk*, how much risk do you think earthquakes pose to people and property in Oklahoma?	1—No risk … 10—Extreme risk
Earthquake cause	In your view, what is the *primary* cause of the increase in earthquakes that some parts of Oklahoma have experienced over the last few years?	1—Natural shifts of tectonic plates along fault lines (reference category) 2—Human activities such as natural gas extraction and/or wastewater disposal 3—Do not know
Federal government involvement*	On a scale from zero to 10, where zero means *not at all involved* and 10 means *extremely involved*, how involved do you think the U.S. government should be in [randomly assigned: "managing" or "regulating"] the risks associated with earthquakes/wildfires/global warming?	0—Not at all involved … 10—Extremely involved
State government involvement*	On a scale from zero to 10, where zero means *not at all involved* and 10 means *extremely involved*, how involved do you think the State of Oklahoma should be in [randomly assigned: "managing" or "regulating"] the risks associated with earthquakes/wildfires/global warming?	0—Not at all involved … 10—Extremely involved

*Mean response to survey question is not statistically different across randomized word treatment for earthquakes and global warming. However, mean response is different across word choice for wildfires; respondents who saw the word managing had slightly higher, statistically significant at 0.05, mean responses than those who saw the word regulating for both wildfire questions.

Results

Intuitive Federalism for Hazard Risk Management Policy

First, we examine whether public federalism preferences reflect the complex intergovernmental reality of hazard risk management across the types of hazards. Figure 1 suggests that across all three hazards, a significant portion of the sample has equal preferences for state and federal government involvement in addressing risks. Approximately 52 percent of respondents rate preference for state and federal government involvement equally for global warming. The results are similar for earthquakes and wildfires, though slightly smaller. For both hazards, approximately 40 percent of respondents rate state and federal government equally in their preference for intervention. Substantively, these findings suggest that respondents may understand that disaster management is an intergovernmental function and coordination of multiple levels of government is required to address all three hazards, but especially global warming.

However, as we hypothesized, the public displays slightly different federalism preferences for different types of hazards. Figure 1 demonstrates how the distribution is negatively skewed, reflecting preferences for state government, for both wildfires and earthquakes. The distribution for global warming, on the other hand, is positively skewed indicating that the public prefer the federal government intervention to manage risks associated with global warming. As demonstrated in Table 3, the mean for each of these variables is different from zero, suggesting there is statistically significant evidence that respondents prefer the federal government for global warming policy and the state government for earthquakes and wildfires. These results confirm Expectations 2-3 through 2-5. We find evidence that a large portion of our respondents prefer equal levels of state and federal involvement but that on average respondents intuitively match the scope of the hazard to the appropriate level of government. Additionally, we find that the average preference is significantly different across all three comparisons (p-value <.01 for all three; global warming vs. wildfire, t-stat = 33.3; global warming vs. earthquakes, t-stat = 34.0; wildfire vs. earthquakes t-stat = 3.86). These results descriptively confirm Expectation 2-1 that federalism preferences are hazard specific.

In the next section, we present the results from a system of equations SUR analysis. The SUR approach is appropriate when analyzing multiple dependent variables that are similar in concept and measurement such that the residuals may be correlated. Each individual regression can be estimated individually using Ordinary Least Squares (OLS), but the SUR approach estimates the set of regressions simultaneously as a system of equations. The residuals from each regression will be correlated because the regressions share unobservable factors, which explain the dependent variable. One requirement of this method is that each individual regression must have some unique variable that is not included in the other regressions. If this requirement is not met, the SUR estimates will be identical to OLS estimates. We meet this requirement because our variables which measure risk perceptions and causality are unique to each hazard and therefore each individual regression. SUR will also result in equal estimates as individual OLS regression if there is no correlation between the observed residuals. Thus, an important check of the SUR method is evaluating the

correlations between the residuals; we find that there are correlations between the residuals of each regression in Table A4 in the Appendix.

Table 3 Summary Statistics

Statistic	Mean/Mode	*SD*	Min	Max
Dependent variables				
Wildfire federalism preference	−1.4*	2.1	−10	9
Global warming federalism preference	0.57*	1.5	−10	9
Earthquake federalism preference	−1.6*	2.4	−10	8
Independent variables				
Male	0.42	0.49	0	1
Age	61.2	13.7	21	95
Logged income	10.9	0.71	9.2	13.7
Education	5.2	1.8	1	8
Republican (democrats and other omitted)	0.46	0.5	0	1
Ideology	4.6	1.7	1	7
Wildfire risk perceptions	4.1	2.9	0	10
Global warming risk perceptions	6.0	3.1	0	10
Earthquake risk perceptions	5.9	2.4	0	10
Wildfire cause	0.81	0.40	0	1
Global warming cause	0.58	0.50	0	1
Earthquake cause (mode)	2	NA	1	3
Earthquake experience	0.32	0.47	0	1
Wildfire experience	0.19	0.39	0	1
Earthquake future frequency (mode)	2	NA	1	3
Wildfire future frequency (mode)	2	NA	1	3

*$p<.01$, t-test for mean = 0.

Determinants of Intuitive Federalism for Hazard Risk Management Policy

Table 4 presents the regression coefficients from each of the individual regressions that are a part of our SUR system of equations. The benefit of the SUR estimation is that it facilitates testing if coefficients are equal to each other across the regressions. This is not possible in a standard regression framework as each regression is estimated separately instead of simultaneously. Comparing coefficients is done by restricting the models to have equal coefficients and comparing this model to the unrestricted model using the Wald test on the Chi-squared distribution. The results for these tests that help answer RQ2 are presented in Tables 4 and 5.

From Table 4, a few results stick out.[5] First, we see that no variable is consistently related to federalism preferences across all three hazards. This suggests that the effects of respondent demographics and hazard-specific experiences and attitudes are contingent upon the hazard examined. This is true even for hazard-specific beliefs such as causality where we have variables that are measured similarly across all three hazards.

For demographic effects, we find many hazard-specific relationships. However, in general, our results suggest that demographic effects are positively associated with intuitive federalism. Specifically, we find that when significant, all but one demographic is associated with a relative preference for the intuitive, appropriate to scale and scope, level of government. The key exception to this is the negative relationship between age and global warming federalism preferences where age is associated with a relative preference for state over federal government.

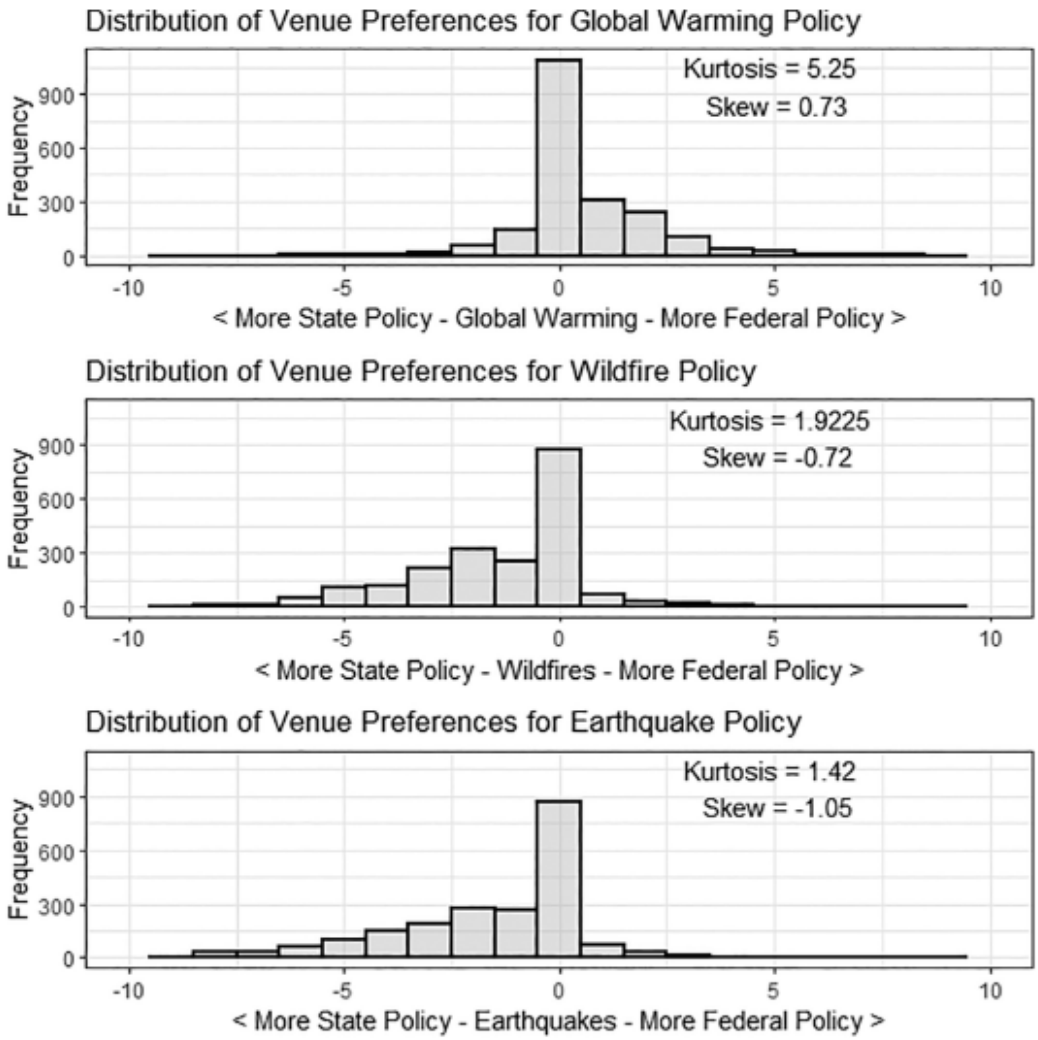

Figure 1 Distribution of Dependent Variables

Examining the role of political beliefs, we find no evidence that partisanship is associated with federalism preferences across all three hazards, in contrast to Expectation 3-1. However, ideology is associated with federalism preferences for earthquakes and wildfires but not global warming. Thus, we find mixed support for Expectation 3-2. This could be, in part, because of correlation between ideology and partisanship, and the inclusion of both in these models. This could also be because of the conflict between conservative ideology and the scale of global warming. Conservative ideology is generally associated with preferences for less government or for lower levels of government. Given this implied conflict, we see intuitive federalism is engaged and conservative respondents are no different, statistically, from their liberal counterparts in their relative preference for government levels to address global warming. However, for earthquakes, going from most liberal to most conservative, respondents will move 1.6 points, or two-thirds of a SD, in relative preference for state government. For wildfire federalism preferences, the change is slightly smaller at 1.3 points, or just over 0.6 SDs, on our wildfire federalism preferences measure.

Table 4 Seemingly Unrelated Regression Results

	Global Warming Federalism Preferences	Wildfire Federalism Preferences	Earthquake Federalism Preferences
Age	−0.006* (0.003)	−0.007 (0.004)	−0.014*** (0.004)
Male	0.21** (0.073)	0.044 (0.10)	0.14 (0.11)
Education	0.040 (0.021)	−0.14*** (0.030)	−0.063 (0.033)
Logged Income	0.085 (0.056)	−0.17* (0.077)	−0.34*** (0.084)
Republican	0.033 (0.09)	0.024 (0.12)	−0.20 (0.13)
Ideology	−0.032 (0.030)	−0.21*** (0.036)	−0.26*** (0.040)
White	0.12 (0.11)	−0.24 (0.16)	−0.11 (0.17)
Earthquake experience			−0.17 (0.11)
Earthquake: Less frequent in future			−0.024 (0.12)
Earthquake: More frequent in future			0.35** (0.13)
Earthquake: Human caused			−1.35*** (0.14)
Earthquake: Do not know cause			−0.64*** (0.16)
Earthquake: Risk perceptions			0.029 (0.024)
Wildfire experience		−0.26* (0.12)	
Wildfire: Less frequent in future		0.22 (0.14)	
Wildfire: More frequent in future		0.004 (0.11)	
Wildfire: Human caused		−0.014 (0.11)	
Wildfire: Managing vs. regulating[a]		0.11 (0.09)	
Wildfire: Risk perceptions		0.005 (0.016)	
Global warming: Effects in OK, Yes	0.05 (0.14)		
Global warming: Effects in OK, Do not know	0.35** (0.11)		
Global warming: Human caused	0.57*** (0.11)		
Global warming: Risk perceptions	−0.004 (0.02)		
Constant	−0.72 (0.65)	2.75** (0.89)	5.39*** (0.97)
N-size	1,773	1,773	1,773
Adjusted R^2	0.057	0.049	0.090
Root MSE	1.49	2.07	2.25

Notes: OLS R^2 for system: 0.075; McElroy r^2 for system: 0.065.
*$p<.05$.
**$p<.01$.
***$p<.001$.
[a]Because the word choice affected mean response, we include an indicator where 1 = regulating, 0 = managing.

Looking to hazard-specific factors, it is important to compare similar concepts when possible. For all three hazards, we have a measure of their beliefs about causality. For wildfires, we find no association between believing most wildfires are human caused and federalism preferences.[6] However, this same belief, that human activity is causing global warming or earthquakes in Oklahoma, has a strong relationship with intuitive federalism preferences. These results suggest mixed support for Expectation 4-3. Importantly, the effects are in opposite directions, in both cases strengthening relative preferences for the intuitive level of government, state for earthquakes, and federal for global warming. In contrast to Expectation 4-1, risk perceptions are unrelated to federalism preferences for all three hazards.

For earthquakes specifically, we find that believing earthquakes will become more frequent in the future is associated with relative support for federal, over state, involvement. This could be, in part, because of the importance of the oil and gas industry in the state of Oklahoma. People may know that the state government may not be able to easily regulate the biggest industry in the state, therefore, they expect the federal government to be involved in this matter more. For wildfires, beliefs about future frequency are not associated with federalism preferences. Thus, we find mixed support for Expectation 4-2. However, experience of a wildfire is associated with relative support for state involvement in addressing risks while experience with earthquakes is not associated with federalism preferences. Again, we find mixed support for Expectation 5.

We also estimate SUR models for a modified dependent variable where all negative values are recoded as −1 (state > federal) and all positive values are recoded as positive one (federal > state); all zeroes remain coded as zero. These results are presented in Table A5 in the Appendix. We estimate this model because it emphasizes the relative nature of intuitive federalism. In general, our main findings for political dispositions, issue specific measures, and problem definition are robust to this specification. Additionally, see Table A4 in the Appendix, which shows the residual correlations among the individual regression components of our SUR system. These results confirm Expectation 2-2 that federalism preferences and their explanations are more similar for earthquakes and wildfires than for either compared to global warming. Finally, we use the SUR approach to statistically compare coefficients across each regression in Table 5.

Table 5 provides the answers to our second research question (RQ2), which asked which individual characteristics are or are not consistently associated with federalism preferences across hazards. Most of our coefficient tests do not result in statistically significant differences, suggesting that of the potential explanatory factors we included most are not hazard specific. However, for certain key variables, we see that their effects differ depending on the hazard examined. For education, this means the effect on wildfire federalism preferences is more negative (toward state government) than for earthquake federalism preferences. For income, the reverse is true; the effect is more negative (toward state government) for earthquakes than for wildfires. Across both education and income, the signs are opposite when comparing global warming to either other hazard; thus, it is relatively unsurprising that these differences are statistically significant. Importantly, these results suggest education and income are both associated with a relative preference for the level of government as predicted by intuitive federalism.

Among explanatory variables, the only other one which is different across all three pairs is human causation. In this case, the coefficients are negative for earthquakes (significant) and wildfires (nonsignificant) and positive for global warming (significant). This suggests that believing earthquakes are caused by human activity is more strongly associated with preference for state government addressing the risks

than for wildfires. This is also in contrast to beliefs about global warming being caused by human activity, which is associated with a preference for the federal government addressing the risks. These results suggest causal beliefs are strongly associated with "intuitive (disaster) federalism" preferences.

Finally, comparing coefficients, we find that the coefficient of ideology on federalism preferences is not different when comparing earthquakes and wildfires. However, when comparing either earthquake or wildfire federalism preferences to global warming federalism preferences, we find a statistically significant difference in coefficients. Thus, while in all three models the coefficient is negative, suggesting conservatives have a relative preference for state government, it is more negative for wildfires and earthquakes than for global warming. These results, again, are generally robust to differences in the dependent variable specification, seen in Table A5 in the Appendix.

In summation, we find that many of the possible relationships we examined are inconsistent across hazards. These findings suggest that some explanations for federalism preferences are hazard specific, providing evidence for Expectation 2-1. Examining multiple hazards allowed us to illuminate which explanations for policy and federalism preferences are generalizable and which are specific.

Discussion

The main purpose of this study was to explore federalism preferences for hazard risk management policies for three hazards: global warming, earthquakes, and wildfires. It is important to understand federalism preferences and intuitive federalism, especially under conditions of jurisdictional mismatch and intergovernmental collaboration. If the public believes one level of government should do the work but is not, because another level is that the public may develop negative views toward the government. Scholars have shown that the negative reputations of governments and their agencies may impact their autonomy, power, and legitimacy in the political and administrative process (Robinson et al. 2021). Furthermore, we also investigated the factors explaining those preferences.

Utilizing a survey of Oklahomans and SUR techniques, our descriptive analyses suggest that large proportions of respondents prefer equal involvement from the state and federal governments and therefore may understand that disaster management is an intergovernmental responsibility. This public understanding seems to be well-aligned with how disaster management works in the U.S; disaster management is, indeed, an intergovernmental task (Schneider 2008).

However, on average, the analyses also indicate that respondents slightly prefer state intervention to manage risks associated with wildfires and earthquakes but federal intervention for global warming. In disaster federalism, the federal government is expected to take proactive leading roles when the scale and scope of an incident exceed local capacity. Given the expected broader impacts of global warming, our

results suggest that the public may intuitively understand this responsibility and ask for more actions from the federal government in managing potential risks (Arceneaux 2005; Schneider and Jacoby 2013).

Table 5 Chi-Square Statistics from Wald Test Comparing Pair-Wise Coefficients

	Global Warming vs. Wildfire	Global Warming vs. Earthquakes	Wildfire vs. Earthquakes
Age	0.13	3.47	2.97
Male	2.02	0.30	0.81
Education	25.9***	7.28**	5.75*
Logged income	7.97**	19.0***	3.85*
Republican	0.95	2.21	2.75
Ideology	15.9***	21.9***	1.40
White	3.67	1.34	0.55
Experience	NA	NA	0.31
Less frequent in future	NA	NA	2.05
More frequent in future	NA	NA	4.58*
Human cause	13.5***	111.6***	55.3***
Risk perceptions	0.13	1.11	0.74

Notes: NA represents no relevant or possible comparison.
***$p<.001$.
**$p<.01$.
*$p<.05$.

We also found that individual political beliefs and problem definitions are associated with public federalism preferences for global warming, earthquakes, and wildfires. These results are in line with the existing literature (Choi and Wehde 2019; Schneider 2008). One of the most important findings in our analysis is that the determinants of public preferences for disaster federalism vary depending on the types of hazards. Our analyses indicate that while many variables are consistently associated with public preferences for disaster federalism across all three hazards, a substantial portion are not. Our findings support the previous argument that public attitudes and beliefs may vary depending on the characteristics of hazards (Choi and Wehde 2020; DeYoung and Peters 2016).

Our results emphasize the value of comparisons across policies and hazards. This allows for establishing which relationships generalize across hazards or policy areas and which are more hazard-specific. Ultimately, if government responsibility follows from public federalism preferences, then scholars of both must pay special attention to issue-specific variables. Furthermore, our results also emphasize the fact that there is a jurisdictional mismatch in disaster management according to public perceptions for global warming. This finding again supports the argument of intuitive federalism that political knowledge or reality may not necessarily shape public federalism preferences.

A few limitations of our study should be acknowledged. First, the three hazards we study all have human-related causes; severe weather such as tornadoes or hurricanes without human cause may exhibit different relationships or patterns. Future research ought to consider a wider array of hazards and federalism preferences for managing their associated risks. Future research ought to consider hazards that cannot be easily or directly connected to human causes to see if there is variation in federalism preferences rooted in these differential causes. Also, the role of local government is extremely important in disaster management, however, due to data limitations, we are

only able to look at the public preference for state and federal governments. Future research should consider all three levels of government to understand public intuitive federalism in the context of disaster management (see Wehde and Nowlin 2021 for an example).

We also recognize key limitations in our research design and methodology. As with all descriptive survey research, our estimates are not causal. Future work could experimentally manipulate whether respondents received information intended to increase risk perceptions of disasters risks or inform about their causes. This research could also help establish the direction of causality; while we propose causal beliefs lead to disaster federalism preferences, it may be that preferences for federalism actually cause changes in causal beliefs. This research would provide stronger evidence to support changes in communication techniques by public managers charged with addressing disasters. Another limitation is in the methodology. While SUR provides important benefits, the index we analyze means we are unable to specifically distinguish between an increase in federal support or an equal decrease in state level support. While approaches like this are common in the literature (see Choi and Wehde 2020; Konisky 2011; Leland et al. 2020), designs which can better account for absolute and relative changes (see Wehde and Nowlin 2021 for one approach), as opposed to only one or the other, may be helpful in understanding public policy preferences in multi-level systems.

Lastly, we study the public in Oklahoma which may only generalize to smaller, conservative states with a mix of urban and rural populations and similar hazard profiles such as others in the West and Midwest. More specifically, our results for understanding earthquake policy preferences may only generalize to other states where earthquakes are primarily human-activity caused. Given our study considers federalism preferences in a federal system where states can vary widely, future research ought to examine if the patterns we find hold in other states or among a more general sample of the American public. It could be that some of our findings are related to the particulars of the state government and population examined.

Conclusion

One implication of our results is that public managers charged with state-level risk communication and garnering public support focus on education about hazard causes. Knowledge of hazard causes is generally associated with a relative preference for the appropriate level of government. Specifically, public risk communicators should focus on education about hazard causes instead of risk perceptions of the hazards as risk perceptions are associated with, though non-significantly, relative preference for the inappropriate or non-intuitive level of government.

By comparing three hazards and federalism preferences simultaneously, our analyses contribute to scholarly endeavors to understand the effects of hazards with various characteristics on public policy. Future scholars should consider collecting

similar data that allow for comparisons of venue preferences and policy choices across hazards that can take advantage of the methodology we use. SUR allows scholars to directly compare across hazards and account for and assess the correlation of the unexplained variance allowing for more appropriate estimates. We believe data and techniques such as these overcome the limitations of previous research, which either examines disaster management generically or single specific hazards and allow for more generalizable knowledge.

Notes

1. Emergencies and disasters both may pose immediate harm to society; however, they are different in that disasters overwhelm local capacity and require external assistance (Coppola 2015). Despite this, scholars and practitioners often utilize these terms interchangeably since emergency and disaster management can be nested and share components and processes (Al-Dahash, Thayaparan, and Kulatunga 2016). Thus, we use the terms disaster management and disaster Public Preferences for Disaster Federalism: Comparing Public Risk Management Preferences Across Levels of Government and Hazards 743federalism here, but note that disaster management in this article includes the management of both emergencies and disasters.

2. Mitigation and preparedness phases generally begin before disasters occur. The mitigation phase is to prevent the likelihood of a disaster happening or to reduce its consequences. During the preparedness phase, disaster management actors make plans for and train relevant actors for disaster response and recovery. One important task during the preparedness phase is educating the public. Once a disaster occurs, the response phase begins. During this phase, disaster management personnel provide immediate aid to the population affected. The disaster recovery phase, then, is intended to return the community or society to normal or a “new normal” (Coppola 2015).

3. The ICS is a hierarchical structure that provides a standardized framework for different levels of government and multiple agencies to cooperate and coordinate response activities during disasters (Lester and Krejci 2007).

4. While we acknowledge the importance of local governments in hazard risk management, due to data limitations we are only able to consider state and federal governments.

5. Table 4 also suggests we have limited explanatory power for our dependent variables as demonstrated by the low adjusted R2 values. This is partially due to our index construction, which reduces the overall variance of the dependent variable relative to the individual policy preference measures. Also, our interest in theory testing as opposed to model building presupposes a focus on the signs and significance of the coefficients over R2 values. All variance inflation factors are less than 5 (largest is 3.05), and therefore multicollinearity does not seem to be a significant problem. See Table A1 for a correlation table of all continuous independent variables.

6. See Table A2 for a regression with a more nuanced wildfire causation variable. We dichotomize between human and natural causes here for simplicity and comparison; however, human causes of wildfire can range from accidental to intentional. Importantly we find no significant differences between the expanded model and the model in the text or across all causes (Table A3).

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Appendix

Table A1 Correlation Table of Continuous Independent Variables

Variable	Age	Logged Income	Ideology	Education	Wildfire: Risk Perceptions	Global Warming: Risk perceptions	Earthquake: Risk Perceptions
Age	1	−0.16***	0.068*	−0.088**	−0.14***	−0.009	−0.061*
Logged Income		1	0.037	0.39***	−0.017	−0.075*	−0.084**
Ideology			1	−0.143***	−0.064*	−0.64***	−0.36***
Education				1	−0.063*	0.087**	0.025
Wildfire: Risk perceptions					1	0.17***	0.26***
Global warming: Risk perceptions						1	0.51***
Earthquake: Risk perceptions							1

***$p<.001$.
**$p<.01$.
*$p<.05$.

Table A2 OLS Estimates for Wildfire Venue Preferences With Nuanced Causality Measurement

	Wildfire Federalism Preferences
Age	−0.008** (0.004)
Male	0.048 (0.102)
Education	−0.136*** (0.030)
Logged Income	−0.174** (0.077)
Republican	0.022 (0.123)
Ideology	−0.211*** (0.036)
White	−0.201 (0.160)
Wildfire: Managing vs. regulating[a]	0.036 (0.099)
Wildfire Experience	−0.278** (0.131)
Wildfire: Less frequent in future	0.322** (0.153)
Wildfire: More frequent in future	−0.038 (0.120)
Wildfire: Risk perceptions	0.032* (0.018)
Wildfire cause: Arson[b]	0.146 (0.160)
Wildfire cause: Lightning, natural accidents	0.150 (0.131)
Wildfire cause: Industrial accidents	0.377 (0.540)
Wildfire cause: Prescribed burns that spread	0.198 (0.187)
Constant	2.580*** (0.880)
N	1,773
R^2	0.059
Adjusted R^2	0.051
Residual *SE*	2.072 (*df* = 1,756)
Statistic	6.928*** (*df* = 16; 1,756)

*$p<.05$.
**$p<.01$.
***$p<.001$.
[a]Because the word choice affected mean response, we include an indicator where 1 = regulating, 0 = managing.
[b]Omitted cause: Accidents from BBQs, campfires… etc.

Table A3 Results From Seemingly Unrelated Regression for Three Point Federalism Preferences Scale

	Global Warming Federalism Preferences	Wildfire Federalism Preferences	Earthquake Federalism Preferences
Age	−0.002 (0.001)	0.0003 (0.001)	−0.001 (0.001)
Male	0.050 (0.03)	0.005 (0.03)	0.056 (0.03)
Education	0.023* (0.009)	−0.040*** (0.009)	−0.021* (0.009)
Logged income	0.041 (0.02)	−0.040 (0.02)	−0.066** (0.02)
Republican	−0.020 (0.04)	−0.012 (.04)	−0.096** (0.04)
Ideology	−0.014 (0.01)	−0.052*** (0.01)	−0.046*** (0.01)
White	0.068 (0.05)	−0.083 (0.05)	−0.068 (0.05)
Earthquake experience			−0.066* (0.03)
Earthquake: Less frequent in future			0.006 (0.03)
Earthquake: More frequent in future			0.092** (0.04)
Earthquake: Human caused			−0.26*** (0.04)
Earthquake: Do not know cause			−0.15*** (0.04)
Earthquake: Risk perceptions			0.013* (0.006)
Global warming: Effects in OK, Yes	−0.023 (0.06)		
Global warming: Effects in OK, Do not know	0.089 (0.05)		
Global warming: human caused	0.249*** (0.05)		
Global warming: Risk perceptions	0.006 (0.008)		
Wildfire: Managing vs. regulating[a]		0.022 (0.03)	
Wildfire Experience		−0.093** (0.04)	
Wildfire: Less frequent in future		0.070 (0.04)	
Wildfire: More frequent in future		−0.017 (0.03)	
Wildfire: Risk perceptions		0.003 (0.005)	
Wildfire: Human caused		−0.017 (0.03)	
Constant	−0.399 (0.27)	0.467 (0.26)	0.794** (0.26)
Root mean squared error	0.62	0.60	0.59
Adj-R^2	0.07	0.04	0.07

Notes: OLS R^2 for system: 0.07; McElroy r^2 for system: 0.06.
*$p<.05$.
**$p<.01$.
***$p<.001$.
[a]Because the word choice affected mean response, we include an indicator where 1 = regulating, 0 = managing.

Table A4 Correlation Matrix of the Residuals

	Earthquake Federalism Preferences	Global Warming Federalism Preferences	Wildfire Federalism Preferences
Earthquake federalism preferences	1.0	0.080	0.47
Global warming federalism preferences	0.080	1.0	0.084
Wildfire federalism preferences	0.47	0.084	1.0

Table A5 Chi-Square Statistics from Wald Test Comparing Pair-Wise Coefficients for Federalism Preferences SUR (Models in Table A1 in the Appendix)

	Global Warming vs. Wildfire	Global Warming vs. Earthquakes	Wildfire vs. Earthquakes
Age	2.00	0.73	0.54
Male	1.14	0.03	2.38
Education	25.2***	13.0***	3.72
Logged Income	6.55*	12.0***	1.10
Republican	0.02	2.37	4.47*
Ideology	5.51*	4.14*	0.19
White	5.36*	4.55*	0.09
Experience	NA	NA	0.36
Less frequent in future	NA	NA	1.60
More frequent in future	NA	NA	5.55*
Human cause	20.9***	67.8***	21.4***
Risk perceptions	0.05	0.55	1.66

Notes: NA represents no relevant or possible comparison.
***$p<.001$.
**$p<.01$.
*$p<.05$.