

Changing Patterns of Evidence Use: Findings from the 2013 Survey of State Agency Decision Making

Delivered at:

2013 Association for Public Policy Analysis and Management (APPAM) Fall Conference; Washington, DC

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Abstract:

While there has been increasing attention to evidence-based practices (e.g., Provan et al., 2013), one of the central concerns yet to be adequately addressed is the degree to which agency attention to evidence varies over time. While there appear to be growing demands for agencies and officials to base program decisions on scientific evidence of effectiveness, there is little information about whether those demands actually shape agency behavior. Research on this is developing, as demonstrated by Jennings & Hall (2012).

Jennings & Hall (2012) have explored agency use of various forms of information across a number of agency types in the U.S. setting, particularly focusing on the use of scientific evidence of effectiveness relative to other forms of information. Their work has suggested that agencies face different demands in their environments and vary in the extent to which they have relevant evidence available to guide their programs, so they value information of different types to varying degrees. As Hall and Jennings (2008) indicate, the level of evidence needed in any specific agency environment will be somewhat dependent on the inherent risk involved.

Building on this foundation, we seek to expand knowledge by asking three specific questions: 1) how has agency attention to different types of information changed from 2008 to 2013? 2) Are there notable differences in patterns of change across agencies working in distinct functional areas? 3) Does fiscal stress affect the use of some types of information differently than others? One important question is whether the same factors that affect the use of performance information also affect attention to different types or sources of information (Ammons and Rivenbark, 2008; Julnes and Holzer, 2001; Moynihan and Pandey, 2005).

Introduction

One of the central concerns yet to be adequately addressed in the performance management literature is the role of fiscal stress in agency decision making, particularly with respect to the use of various forms of performance information in the decision process. Does fiscal stress increase managerial attention to information about agency programs and practices, or does external information seeking decline to reallocate attention to more pressing needs? Fiscal stress has not been examined explicitly with respect to its influence on changes in utilization of performance information, though research in performance management has considered the role of resource levels as a factor explaining adoption and implementation of PM (e.g. Julnes & Holzer 2001). Interestingly, some research that explicitly examines factors influencing adoption and use of performance measurement does not consider resource levels (e.g. Moynihan & Pandey 2005; Ammons & Rivenbark 2008). Jennings & Hall (2012) have explored agency use of various forms of information across a number of agency types in the U.S. setting, particularly focusing on the use of scientific evidence of effectiveness relative to other forms of information. Their work has suggested that agencies are not created equal, nor is the evidence base from which they draw, and so they value information of different types to varying degrees. As Hall and Jennings (2008) indicate, the level of evidence needed in any specific agency environment will be somewhat dependent on the inherent risk involved.

Building on this foundation, we seek to expand knowledge by asking three specific questions: 1) how has agency attention to different types of information changed from 2008 to 2013? 2) Are there notable differences in patterns of change across agencies working in distinct functional areas? 3) Does fiscal stress affect the use of some types of information differently than

others? One important question is whether the same factors that affect the use of performance information also affect attention to different types or sources of information (Ammons and Rivenbark, 2008; Julnes and Holzer, 2001; Moynihan and Pandey, 2005).

We report findings from the second Survey of State Agency Decision Making to shed light on each of these key questions. The SSADM-2013 is conducted as a partnership between the University of Kentucky, Rutgers University—Newark, and the Council of State Governments. It is delivered to the highest official in each of 14 agency types across the 50 U.S. states (N=700). The 2013 iteration of the Survey repeats key questions on information use from the initial survey (SSADM-2008) but adds new questions to contextualize responses in terms of the agency's fiscal climate, perceived accountability demands, and changes in staffing levels. These controls allow us to examine important changes in agency information-seeking behavior relative to the pressures facing the agency. Our findings will be informative in offering quantitative demonstration of the role fiscal stress plays as a factor in the use of evidence relative to other forms of information, and will offer insight into agency use of performance-oriented information more generally.

Literature on the Use of Evidence Based Policy and Practice

There is a large and rapidly growing body of research on evidence based policy and practice, epitomized by the fact that a new journal devoted to the topic, *Evidence & Policy: A Journal of Research, Debate, and Practice*, is now in its 9th year of publication. Much of this literature addresses topics like the meaning of evidence (Head, 2008), strategies to promote the use of scientific evidence in decision-making and practice (Freiberg and Carson, 2010; Vanlandingham and Drake, 2012), factors that affect the reception and use of evidence (e.g.,

Howlett, 2009), and strategies for developing the best evidence base to inform decisions-making (Hunter, 2009; Konnerup and Kongsted, 2012). Systematic quantitative analyses of the use of evidence-based policies and practices are quite limited in number (but see Jennings and Hall, 2012; Landry, Lamari, and Amara, 2003; Head, *et al.*, 2013), but there is considerable interest in what affects the use of evidence.

Howlett (2009) identifies policy analytic capacity as a key determinant policy makers' ability to implement evidence-based policy. Jennings and Hall's (2012) found that state agencies with greater scientific evidence availability made greater use of scientific/professional sources of information. Landry, Lamari, and Amara (2003), in a study of the use of university research in Canadian agencies, found that the nature of the research, the context of the user, work and policy relevance, adaptation of products, acquisition efforts, and linkage mechanisms all had a positive influence on use considering all policy domains. When policy domains were considered separately, user context, work relevance, adaptation of product, acquisition efforts, and linkage mechanisms increased use across almost all seven domains. Lundin and Oberg studied of the use of expert knowledge in Swedish local government. They reported that high levels of public attention increase expert policy advice from administrators and critical reflection by politicians. When there are large political disagreements, administrators use expert information more, but politicians deliberate less on administrator's policy advice in these situations. To quote: "Thus, conflict seems to generate a pressure on administrators to search for expert knowledge. But, at the same time, within a context of political disputes, politicians make less effort to understand and critically reflect over the information provided to them by the administration, and are less inclined to change their opinions even if good arguments are presented to them (Lundon and Olberg, 2013: 1). Head and colleagues (2013) report a study of interest in and use of social

research by public servants in Australian federal and state governments. In this initial report of a large study, the authors find that 40 percent of state officials report that academic research was used in informing policy making, influencing policy thinking, and legitimating policy choices in their agency. Whether this research meets high standards of validity and reliability is not addressed, but in a separate question about characteristics of research that enhance its use, 53 percent of respondents gave high scientific quality high priority. Of greater importance were the timeliness of the research, its unbiased nature, the provision of brief summaries of key findings, findings having direct implications for policy, and clarity of presentation of the research.

Fiscal stress in the states and the effect of fiscal stress on decision making

The American states experienced considerable fiscal stress as they went through the Great Recession of 2007-2009. Revenues declined precipitously for many states and demand for services peaked as unemployment rose sharply. The economic climate left many states with declining revenues for several years and the recovery has been uneven. Five years after the recession began, unemployment is still well above pre-recession levels. To make matters worse, the fiscal plight of the states is aggravated by underfunding of public employee retirement benefits and cuts in federal funding with the end of stimulus funding and the sequestration of federal funds.

Without going into depth, we can highlight the economic and fiscal impacts of the Great Recession on the states. In advance of the recession, in 2007, the unemployment rate in the U.S. was 4.6 percent. It ranged from 2.6 percent in Utah to 7.1 percent in Michigan. At its peak in 2009, the unemployment rate across the country was 10.0 percent. In the states, it ranged from 4.1 percent in North Dakota and 4.7 percent in Nebraska to 11.6 percent in Nevada and 13.4

percent in Michigan. That year, six states had unemployment rates under 6 percent, whereas 8 states experienced unemployment rates over 10 percent. Although the national economy began to expand in 2009, employment was slow to respond and it responded differently across the country. By 2011, the national unemployment rate had fallen to 8.9 percent, but 8 states still had unemployment rates exceeding 10 percent, including Nevada at 13.5 percent; 6 states had unemployment rates under 6 percent that year, including North Dakota at 3.5 percent.

American states experienced substantial budgetary effects from the economic decline. Data from the Center on Budget and Policy Priorities (2012) indicate the states experienced collective budget shortfalls of \$110 billion in FY 2009, \$191 billion in FY 2010, \$130 billion in FY 2011, and \$107 billion in FY 2012. According to the National Governors Association and National Association of State Budget Officers (NGA/NASBO) (2010), this decline in state revenues was so severe that state spending actually declined in both FY 2009 and FY 2010. Of course, this fiscal pain was spread very unevenly across the states. For example, in FY 2009, spending from state funds declined by almost 36 percent in South Carolina, 34 percent in Indiana, and 33 percent in Wisconsin. In that year, spending from state funds actually grew in Connecticut (11.1 percent), Maine (12.1 percent), Massachusetts (2.3 percent), and Missouri (5.6 percent). In FY 2010, sales tax collections fell by almost 14 percent in Arizona, 13 percent in Nevada, 12 percent in Alabama, but grew by 16 percent in Iowa and 8 percent in Indiana (NGA/NASBO, 2010),

So, what are the likely consequences of such fiscal stress for the use of evidence-based practices and the acquisition of information by state agencies? Reformers and best practice proponents often view fiscal stress as an opportunity to get governments to focus on important activities and improve performance (e.g., Kinney, Hutchinson, Osborne, 2002). Scholars have

argued that cities have three basic strategic options under conditions of fiscal stress: cut spending, increase revenues, or enhance productivity (Morgan and Pammer, 1988). Some scholars have found that fiscal stress stimulates productivity. Lewis (1988) determined that instead of making cut across the board in response to fiscal stress, cities engaged in rational approaches with targeting of cuts on less efficiently performed functions. MacManus and Grothe (1989) found that fiscally stressed counties implemented more sophisticated revenue forecasting techniques than did counties experiencing less stress. Grosskopf, Hayes, and Hirschberg (1995) determined that the Dallas Police Department became more efficient when faced with budgetary stress. Poister and McGowan (1984) reported that urban managers believe productivity improvement can make a strong contribution to fiscal health. In a similar manner, Stipak and O'Toole (1993) found that local managers facing fiscal stress believed that productivity improvement was as important as reducing services and raising revenues and could lead to increased use of tools for productivity improvement. Of interest, given contemporary interest in evidence-based practices, is the fact that these various studies make no mention of the use of analytical tools like program evaluation, cost-benefit analysis, or evidence-based practices as states and communities search for strategies to address fiscal stress. We have, however, found one study that assesses the relationship between evaluation and fiscal stress. Gray and Jenkins (1989-90) report that tight fiscal conditions and concerns about administrative costs in Great Britain led to shift from "top-down rational systems of evaluation to more pragmatic, bottom-up concerns with performance measures and performance indicators." This would be consistent with increased attention to evidence.

On the other hand, some studies find that fiscal stress can reduce rationality in decision making and lead to across the board cuts in programs. Nelson (2012) found that increasing fiscal stress in a set of U.S. municipalities led to less predictable, less rational decisions. Hendrick (1989) found evidence of considerable incrementalism in a local community's response to austerity.

We suggest two theoretical scenarios about the impact of fiscal stress on attention to evidence-based practices. In Scenario 1, fiscal stress leads to demands to cut costs. It eliminates slack resources in public organizations. Consistent with incremental or political theories of budgeting, this leads to either across the board cuts or cuts based on political and policy priorities. Agencies and officials are left with neither time nor resources to search for evidence on effectiveness. As a result, evidence-based policy research is irrelevant.

Scenario 2 is quite different. Again, fiscal stress leads to demands to cut costs and reduces slack resources. Despite this, it leads to a focus on what really works. Policy makers, intent on making the most of limited tax revenue, have an opportunity to eliminate wasteful programs. The greater the stress, the more intense the search. In this situation, policy makers and administrators search for evidence about what works. This might be experiential evidence, but it can also be drawn from scientific studies. In contemporary policy making, this is facilitated by the presence of sites that compile evidence about what works, such as the What Works Clearinghouse of the U.S. Department of Education (found at <http://ies.ed.gov/ncee/wwc/>), the What Works Collaborative of the Urban Institute (see <http://www.urban.org/what-works-collaborative.cfm>) or the Coalition for Evidence-Based Policy (see <http://coalition4evidence.org/>).

Under Scenario 1, levels of fiscal stress ought to affect attention to evidence-based practice, with states and agencies experiencing higher levels of stress turning less to evidence-based practices than states experiencing lower levels of fiscal stress. With increasing stress, we would expect greater reliance on internal sources of information and political sources of information. Under Scenario 2, increasing stress leads to increasing information search, particularly for evidence-based practices. States and agencies experiencing more stress should search evidence-based sources more extensively than states or agencies experiencing less stress.

Design of Current Study

In 2008, the authors of this study surveyed the administrators of 12 agencies in the 50 American states about their agency's use of various sources of information to inform decision making about program policies and operations (Hall and Jennings, 2010, Jennings and Hall, 2011, and Jennings and Hall, 2012). That study examined the relative attention agencies gave to 19 different sources of information used to make decisions and the importance attached to those agencies. We selected twelve agency types to represent the broad spectrum of state government policy activity and to provide for comparison by policy area:

- Alcohol and Substance Abuse
- Children and Youth Services
- Developmental Disabilities
- Economic Development
- Environmental Protection
- Fish and Wildlife
- Hazardous Waste Management
- Natural Resources
- State Police
- Tourism
- Transportation and highways
- Vocational Rehabilitation

The current study relies on a similar survey. It includes many of the same questions but has been expanded to ask question about fiscal stress and strategic planning. In addition, we have added Medicaid and Education to the list of agencies to be surveyed, giving us a total of 14 agencies in 50 states.

Administration of the survey started with a mailing to all agencies May 22, 2013. This was followed several weeks later with a postcard reminder. Following this, we sent an email reminder to all agencies for which we have email addresses. The survey was sent to the head of the agency, but we have no way of knowing whether the head completed the survey or delegated the task of responding to someone else in the agency. Data collection was closed September 16, and duplicates were removed (these result from responses to both paper and online versions of the survey or receipt of multiple paper copies; on a case-by-case basis responses were evaluated to determine which was received from the highest administrator and which was most complete; these were retained). Following this cleanup, 212 responses remained for a response rate of 30.3%, slightly below the 2008 rate.

Respondents were asked to identify the degree to which their agency consults each of 19 different sources of information for ideas that could improve their operations. They were also asked how much weight the agency attaches to information from each source. An additional question asked administrators to compare their use of these sources in the most recent fiscal year compared to past fiscal years. The 19 potential sources of information we included are:

- Accrediting Bodies
- Professional Associations
- Professional Literature
- Research and Formal Evaluations
- Scientific Studies
- Consultants
- Think Tanks

- Innovation Award Programs
- Internal Agency Staff
- Other Agencies in Your State
- Comparable Agencies in Other States
- Federal Government Agencies
- Associations of Government Officials (such as NGA, CSG, NASBO)
- Governor
- Legislators
- Legislative Staff
- Local Government Officials
- Interest Groups
- News Media

This is a diverse set of sources, including those inside and outside of state government, those that are political and those that are non-political, those that are likely to provide scientific evidence of what works and those that are not likely to provide such information. In our earlier work, we discovered distinctive patterns in agency use of these sources. Factor analysis revealed four clusters of information sources: political, professional/scientific, agency/client, and sources of innovation (Jennings and Hall, 2012: 256).

To allow us to examine the effects of fiscal stress, the current survey includes questions asking how the fiscal crisis affected the agency budget in the two most recent budget cycles, whether the agency has experienced greater demands for accountability, and how the agency's change in fiscal resources affected its search for evidence-based practices, program evaluation findings, scientific evidence of program effects, and innovative programs in other states.

Data and Methods

Our analysis consists of three components. First, we want to evaluate the extent to which patterns of information use have changed over time. To do this, we replicate the 2008 factor analysis to determine if information sources grouped in similar fashion, and compare the results. As the following section reveals, there were some changes in the way information sources group

in the 2013 survey responses, which makes direct comparison of factor scores difficult. This leads us to the second component, to determine the extent to which information use has changed in state agencies over the past five years during which the fiscal crisis played out. The timing of the initial survey fell just before the effects of the recession were felt by state agencies, and the 2013 survey just as state economies are beginning to recover, offering insight into the role the fiscal crisis may have exacerbated in agency information use. In particular, we are curious about the change in the use of scientific types of evidence. Our 2008 survey shared 85 matched agency pairs with the 2013 response, allowing us to examine change in each information source's use by the same specific agencies, not just in terms of national averages. These changes are implicitly assumed to result in part from the fiscal crisis. Finally, our analysis extends to the respondent's stated observations about the impact of fiscal stress on their agency decisions. Here we analyze a number of specific questions to provide insight into the effect of fiscal stress on state agency search for information.

Factor analysis further enables us to determine if there are underlying relationships among agency use of the 19 information sources we identified. Factor analysis is a multivariate method which can be used either for confirmatory analysis or exploratory analysis. Whereas our 2008 research (Hall & Jennings 2012) was purely exploratory, lacking any clear theory about the potential groupings of these information sources, our use of factor analysis in the current context better conforms to a confirmatory purpose seeking to validate the relationships observed in 2008. Factor analysis groups variables according to their shared variance into new common factors that reflect underlying constructs in the data. In the confirmatory sense, factor analysis seeks to validate theoretical expectations about the relationships among variables. We factor analyzed the relationships among thirty-eight variables (the 19 sources and weights from the corresponding

survey questions). We included the items from both questions to replicate our 2008 data analysis and because these variables are correlated and provide an overall sense of the degree to which agencies turn to and rely on different sources of information.

Factor analysis is an iterative process that groups variables according to their shared variance. The method of extraction used was principal factors, and the factor loadings were subjected to orthogonal varimax rotation. Analysis of scree following an initial iteration suggested that five common factors were appropriate, rather than the four observed in the 2008 data. In the following iteration, we retained only factors with eigenvalues greater than 1.6, which extracted five factors; this model had the advantageous result of every variable loading onto one of the five factors with no spurious or trivial loadings. Five factors explain 71% of the underlying common variance of the original variables. The factor rotation matrix appears in Table 1. Table 2 presents factor loadings (secondary loadings suppressed for clarity).

As table 2 reveals, there are a few differences from the 2008 loadings. Most notably, the data was better explained by five factors rather than four. This change seems to revolve around a split within what was previously deemed the professional/scientific factor, with professional sources of information beginning to see a stronger differentiation from scientific sources in the new survey. We characterize the five factors along the following dimensions: (1) political, (2) scientific evidence, (3) agency/client, (4) innovation, and (5) professional networks. All but one pair of variables (use/weight) loaded on the same factor. It is curious that the weight given to consultants as a source of information loaded onto factor 3 while consultants frequency of use loaded on factor 4.

We observe the following differences between the 2008 results and the 2013 findings:

1) the 2008 political factor included Associations of Government Officials, whereas that now loads on the innovation factor.

Figure 1: Analysis of Scree

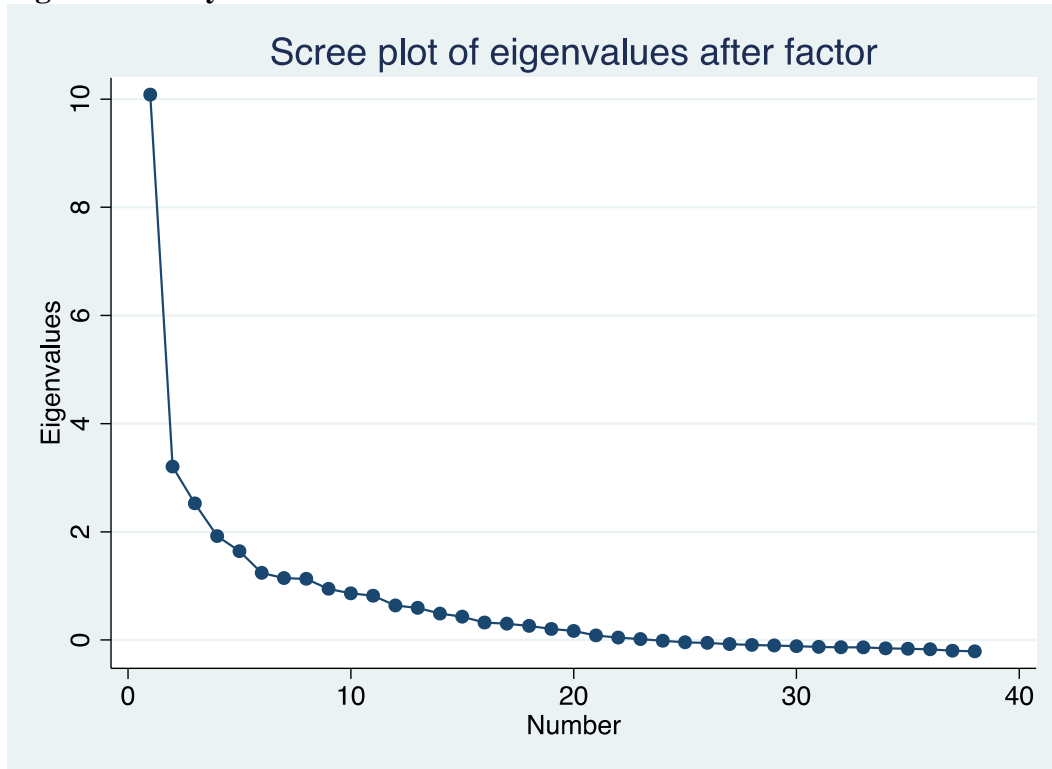


Table 1: Factor Rotation Matrix

	Factor1	Factor2	Factor3	Factor4	Factor5
Factor1	0.6528	0.4556	0.4929	0.2629	0.233
Factor2	-0.6143	0.423	0.014	0.6539	0.1263
Factor3	0.2232	-0.7153	-0.0395	0.6492	0.1246
Factor4	0.3522	0.2992	-0.869	0.1336	0.1156
Factor5	-0.1507	-0.1106	-0.0118	-0.2531	0.9491

2) The 2008 professional/scientific factor is now split in two, with a clearer division between the two. Professional literature, research, and scientific studies now stand alone on factor (3), while a new professional networks factor (5) includes professional associations and

accrediting bodies. This suggests that state agencies are becoming more sophisticated users of information, able to differentiate professional and scientific sources.

Table 2: Factor Loading Matrix

	1	2	3	4	5
Information Source	Political	Scientific Evidence	Agency / Client	Innovation	Professional Networks
Governor (Consulted)	0.7507				
Governor (Weight)	0.678				
Legislators (Consulted)	0.8477				
Legislators (Weight)	0.6716				
Legislative Staff (Consulted)	0.7762				
Legislative Staff (Weight)	0.64				
Local Government Officials (Consulted)	0.7555				
Local Government Officials (Weight)	0.5836				
News Media (Consulted)	0.4621				
News Media (Weight)	0.468				
Professional Literature (Consulted)		0.7058			
Professional Literature (Weight)		0.7927			
Research and Formal Evaluations (Consulted)		0.62			
Research and Formal Evaluations (Weight)		0.7563			
Scientific Studies (Consulted)		0.7041			
Scientific Studies (Weight)		0.7211			
Other Agencies in Your State (Consulted)			0.4531		
Other Agencies in Your State (Weight)			0.5898		
Comparable Agencies in Other States (Consulted)			0.5251		
Comparable Agencies in Other States (Weight)			0.6194		
Federal Government Agencies (Consulted)			0.6352		
Federal Government Agencies (Weight)			0.6795		
Interest Groups (Consulted)			0.4273		
Interest Groups (Weight)			0.5021		
Consultants (Weight)			0.5075		
Consultants (Consulted)				0.3887	
Think Tanks (Consulted)				0.6588	
Think Tanks (Weight)				0.5766	
Innovation Award Programs (Consulted)				0.6589	
Innovation Award Programs (Weight)				0.6788	
Internal Agency Staff (Consulted)				-0.2965	
Internal Agency Staff (Weight)				-0.3586	
Associations of Government Officials (Consulted)				0.5724	
Associations of Government Officials (Weight)				0.5414	
Accrediting Bodies (Consulted)					0.7372
Accrediting Bodies (Weight)					0.7722
Professional Associations (Consulted)					0.4762
Professional Associations (Weight)					0.5214

*Principal factors method of extraction, varimax rotation, secondary and spurious loadings suppressed.

3) The 2008 Innovation factor is expanded to include internal agency staff, which previously loaded on the agency/client factor. It now carries a negative coefficient indicating an inverse relationship between its use and that of the other sources on the factor. In interpreting factor scores, an agency with negative scores favors internal agency employees whereas a positive score indicates more of an external perspective characterized by innovation versus stability.

With no ability to directly compare the 2008 factor scores to the 2013 factor results, we turn to the second component of our analysis: a comparison of each of the individual variables across the full 2008 and 2013 response sets. Table 3 presents the 2008 and 2013 means by information source using only the consultation variable (not the weight variable), emphasizing the change in mean from 2008 to 2013. These differences were computed by subtracting the 2008 value from the 2013 value, so a positive mean conveys an increase in the use of the particular source. Following the mean computation, a series of t-tests were performed to determine if the observed differences are in fact statistically significant ($p < .05$). The results reveal that most variables have undergone some change.

Table 3: Population Mean Change 2008-2013 by Information Source (Use Only, not Weight)

	2013	Std.	2008	Std.	Change		
	Mean	Err.	Mean	Err.	(2013-2008)	t	p(t)
ACCREDITING BODIES	2.9111	0.0785	2.888	0.0821	0.023	-0.5652	0.5722
PROFESSIONAL ASSOCIATIONS	3.7111	0.0613	2.168	0.065	1.543	-18.6014	0
PROFESSIONAL LITERATURE	3.85	0.0666	2.051	0.06	1.799	-21.4093	0
RESEARCH AND FORMAL EVALUATIONS	3.8278	0.0713	2.015	0.0661	1.812	-19.929	0
SCIENTIFIC STUDIES	3.6111	0.0824	2.342	0.0766	1.269	-11.9908	0
CONSULTANTS	3.15	0.0758	2.74	0.0682	0.410	-4.2418	0
THINK TANKS	2.1111	0.0668	3.536	0.0717	-1.425	14.1082	0
INNOVATION AWARD PROGRAMS	2.3944	0.0741	3.439	0.0709	-1.044	10.1364	0
INTERNAL AGENCY STAFF	4.4611	0.0519	1.418	0.0395	3.043	-47.8379	0
OTHER AGENCIES IN YOUR STATE	3.4444	0.0674	2.378	0.0622	1.067	-12.1507	0
COMPARABLE AGENCIES IN OTHER STATES	3.8722	0.0615	1.872	0.0605	2.000	-24.5657	0
FEDERAL GOVERNMENT AGENCIES	3.75	0.0722	2.224	0.0651	1.526	-15.9987	0
ASSOCIATIONS OF GOVERNMENT OFFICIALS	3.1278	0.08	2.765	0.0729	0.362	-3.4386	0.0006
GOVERNOR	3.35	0.0839	2.357	0.0732	0.993	-9.7918	0
LEGISLATORS	3.05	0.0769	2.679	0.071	0.371	-4.286	0
LEGISLATIVE STAFF	2.8944	0.0758	2.939	0.0722	-0.044	-0.3965	0.692
LOCAL GOVERNMENT OFFICIALS	2.7944	0.0763	2.949	0.0744	-0.155	1.4535	0.1469
INTEREST GROUPS	3.3222	0.0746	2.49	0.068	0.832	-8.6439	0
NEWS MEDIA	1.9556	0.0624	3.888	0.0693	-1.932	21.7012	0

Three variables show no change in agency use over time: accrediting bodies, legislative staff, and local government officials. However, all of the remaining 16 variables are statistically different in 2013 than they were in 2008. Three information sources decreased in use from 2008 to 2013: think tanks (-1.4), innovation award programs (-1.0), and news media (-1.9). The remaining 13 variables showed concerted increase in use, consistent with a higher level of information seeking overall. The smallest changes were for legislators, associations of government officials, and consultants, each with an increase less than 0.5. The largest changes were observed in the use of internal agency staff (3.0), comparable agencies in other states (2.0) research and formal evaluations (1.8) and professional literature (1.8). Keep in mind that these changes are on a five-point Likert-type scale. This is very interesting, suggesting a substantial increase in attention to sources of experience and scientific/professional knowledge with much smaller increases in attention to political sources.

Taking the data at face value, agency administrators engaged in much more information search activity in 2013 than in 2008. This could reflect the pressure to find better, more efficient ways to operate in the aftermath of the recession and the search for intelligence to guide decisions about that. If so, this could mean that the recession broke the friction that fosters incremental change and opened the door to punctuations in policy and program. Of course, we do not have data to corroborate that supposition.

We next turn to the 85 matched agency pairs that responded to both the 2008 and 2013 surveys. Table 4 presents the findings of our mean comparison and t-tests across the two years on each of the 19 information sources. Table 5 presents the actual differences in means across the sample. A positive mean indicates an increase in the source's consultation by the responding agency. These results point to actual changes in specific agencies, not changes in average across two mixed

samples taken in separate years. What we see here mirrors the changes overall. Five variables had no statistically significant change in consultation: accrediting bodies, consultants, associations of government officials, legislative staff, and local government officials. Of the fourteen remaining variables, three declined in use: think tanks, innovation award programs, and news media. The remaining eleven variables all saw increases in consultation, with the biggest increases in use for internal agency staff, comparable agencies in other states, research and formal evaluations and professional literature.

With these changes observed, it certainly seems that information seeking increased in general over the course of the five-year period from mid-2008 to mid-2013, though attention to some particular sources waned relative to 2008 levels. This suggests to us that the advent of the fiscal crisis led agencies to search more extensively to determine what others are doing that increases efficiency and effectiveness to manage budgetary cutback pressures. In particular there was a concerted decrease in attention to innovation-oriented sources and a concerted increase in those sources generating professional and scientific information.

Table 4:

Matched Pair Analysis; Mean Comparison by Information Source

	2013				2008				Difference Tests	
	n	Mean	St. Error	St. Dev.	n	Mean	St. Error	St. Dev.	t	p(t)
ACCREDITING BODIES	81	3.025	0.134	1.204	83	2.867	0.134	1.217	0.831	0.407
PROFESSIONAL ASSOCIATIONS	79	3.595	0.095	0.840	84	2.143	0.100	0.920	10.501	0
PROFESSIONAL LITERATURE	79	3.709	0.102	0.908	84	2.000	0.093	0.850	12.409	0
RESEARCH AND FORMAL EVALUATIONS	79	3.671	0.119	1.059	84	1.905	0.094	0.859	11.726	0
SCIENTIFIC STUDIES	80	3.450	0.122	1.090	83	2.241	0.121	1.100	7.048	0
CONSULTANTS	79	2.962	0.106	0.940	84	2.893	0.103	0.944	0.468	0.6401
THINK TANKS	79	2.051	0.093	0.830	82	3.610	0.119	1.074	-10.275	0
INNOVATION AWARD PROGRAMS	79	2.278	0.118	1.049	82	3.488	0.114	1.033	-7.368	0
INTERNAL AGENCY STAFF	80	4.413	0.083	0.741	84	1.476	0.071	0.649	27.029	0
OTHER AGENCIES IN YOUR STATE	80	3.300	0.096	0.863	83	2.398	0.106	0.962	6.297	0
COMPARABLE AGENCIES IN OTHER STATES	80	3.813	0.098	0.873	84	1.905	0.089	0.816	14.467	0
FEDERAL GOVERNMENT AGENCIES	80	3.513	0.113	1.006	84	2.119	0.099	0.911	9.307	0
ASSOCIATIONS OF GOVERNMENT OFFICIALS	79	2.924	0.115	1.022	82	2.890	0.110	0.994	0.213	0.8318
GOVERNOR	79	3.253	0.121	1.080	83	2.301	0.116	1.056	5.672	0
LEGISLATORS	80	3.013	0.107	0.961	82	2.549	0.110	0.996	3.015	0.003
LEGISLATIVE STAFF	80	2.813	0.107	0.956	82	2.915	0.110	0.996	-0.666	0.5067
LOCAL GOVERNMENT OFFICIALS	80	2.688	0.098	0.880	82	2.939	0.117	1.058	-1.643	0.1024
INTEREST GROUPS	79	3.063	0.117	1.042	82	2.500	0.107	0.972	3.549	0.0005
NEWS MEDIA	80	1.963	0.098	0.878	82	3.756	0.112	1.013	-12.031	0

Table 5:

Matched-Pair Agency Reported Change in Information Use by Source 2008-2013: Summary Statistics

	Obs	Mean	Std .Dev.	Min	Max
ACCREDITING BODIES	79	0.1265823	1.890374	-4	4
PROFESSIONAL ASSOCIATIONS	78	1.448718	1.27562	-1	4
PROFESSIONAL LITERATURE	78	1.692308	1.407842	-2	4
RESEARCH AND FORMAL EVALUATIONS	78	1.74359	1.436409	-2	4
SCIENTIFIC STUDIES	78	1.205128	1.775438	-3	4
CONSULTANTS	78	0.1025641	1.499695	-3	3
THINK TANKS	76	-1.592105	1.425273	-4	1
INNOVATION AWARD PROGRAMS	76	-1.197368	1.574969	-4	4
INTERNAL AGENCY STAFF	79	2.949367	1.060947	-1	4
OTHER AGENCIES IN YOUR STATE	78	0.9487179	1.376023	-1	4
COMPARABLE AGENCIES IN OTHER STATES	79	1.936709	1.25414	-1	4
FEDERAL GOVERNMENT AGENCIES	79	1.455696	1.474549	-3	4
ASSOCIATIONS OF GOVERNMENT OFFICIALS	76	0.0789474	1.564295	-4	3
GOVERNOR	77	0.961039	1.809635	-3	4
LEGISLATORS	77	0.5194805	1.577893	-2	4
LEGISLATIVE STAFF	77	0.012987	1.473391	-3	3
LOCAL GOVERNMENT OFFICIALS	77	-0.1688312	1.559374	-4	4
INTEREST GROUPS	76	0.6447368	1.670959	-4	4
NEWS MEDIA	77	-1.727273	1.343957	-4	2

The final component of our analysis examines agency reported changes that result from the fiscal crisis. Table 6 presents the response to a general question about the extent to which agencies in our population experienced budgetary change over the past cycle. 26% experienced deep cuts (>10%), and 32% experienced modest cuts (0-10%). 15% experienced no change, 20% experienced incremental growth, and 7% felt significant growth.

Table 7 connects agency fiscal situation to their use of four specific forms of information (evidence-based practices, program evaluation findings, scientific evidence, and innovative programs in other states). These tables reveal strong incremental pressure, as over 50% of

agencies responded there was no change in their search for each type of information as a result of budgetary change.

Table 6: Recent Agency Budgetary Trends

Question 3.1 Recent years have brought significant fiscal stress to state agencies, including budget cuts and greater demands for accountability. How has the fiscal crisis affected YOUR AGENCY in the two most recent budget cycles? Please indicate the response that best indicates the impact on your agency.

Significant Cuts (>10%)	26.3%
Minor Cuts (0-10%)	32.1%
Budget Neutrality (no change)	15.3%
Minor Growth (0-10%)	19.7%
Significant Growth (>10%)	6.6%

Table 8 reports findings of our inquiry regarding the effect of fiscal stress on a number of policy criteria. Agencies report that fiscal stress does not affect the weighting of most criteria, with the exception of cost and efficiency, both of which became more important in 50 percent or more of the responding agencies. About a third indicated that perceived effectiveness in other settings and politics became more important.

Table 7: Effect of Budget Trends on Agency Search for Science-Based Programs

Question 3.3: How did your agency's change in fiscal resources (budget) impact your search for each of the following? Please select the most appropriate response for each item:

(1) Evidence-Based Practices	
Decreased Substantially	2.9%
Decreased Some	5.9%
Did Not Change	53.7%
Increased Some	26.5%
Increased Substantially	11.0%
(2) Program Evaluation Findings	
Decreased Substantially	1.5%
Decreased Some	6.6%
Did Not Change	50.4%
Increased Some	29.2%
Increased Substantially	12.4%
(3) Scientific Evidence of Program Effects	
Decreased Substantially	2.2%
Decreased Some	8.1%
Did Not Change	54.4%
Increased Some	25.0%
Increased Substantially	10.3%
(4) Innovative Programs in Other States	
Decreased Substantially	2.2%
Decreased Some	2.9%
Did Not Change	55.5%
Increased Some	25.5%
Increased Substantially	13.9%

Table 8: Effect of Fiscal Stress on the Importance of Policy Criteria

Question 5.3: Under fiscal stress, such as budget cuts, how does the importance of each of the following change in your agency?
Please select the most appropriate response for each item:

(1) Perceived Effectiveness in Other Adopted Settings	
Becomes less Important	4.5%
Does not Change	59.4%
Becomes More Important	36.1%
(2) Cost	
Becomes less Important	0.8%
Does not Change	12.8%
Becomes More Important	86.5%
(3) Risk to Clients or Recipients	
Becomes less Important	2.3%
Does not Change	77.4%
Becomes More Important	20.3%
(4) Legal Considerations	
Becomes less Important	0.8%
Does not Change	82.6%
Becomes More Important	16.7%
(5) Scientific Evidence of Effectiveness	
Becomes less Important	2.3%
Does not Change	68.2%
Becomes More Important	29.5%
(6) Potential Side Effects	
Becomes less Important	3.8%
Does not Change	76.7%
Becomes More Important	19.5%
(7) Equity	
Becomes less Important	3.0%
Does not Change	77.4%
Becomes More Important	19.5%
(8) Efficiency	
Becomes less Important	0.7%
Does not Change	49.3%
Becomes More Important	50.0%
(9) Politics	
Becomes less Important	3.0%
Does not Change	64.4%
Becomes More Important	32.6%

We turn next to some preliminary regression analyses aimed at determining the relationship between budget conditions and the effect of fiscal stress on agency use of scientific

information. A positive relationship between these variable would indicate that as the budget increased, the effect of a change in fiscal resources on use of the practice increased; a negative relationship would indicate that as budgets increased, the effect of changes in fiscal resources on the use of information declined. Put differently, a decline in budgetary resources led to an increase in the effect of budget change on the use of information. We first looked to our aggregated data for all agencies to determine the effect of budget decline on the effect of budget change on the search for scientific evidence and innovative programs (Evidence-Based Practices, Program Evaluation Findings, Scientific Evidence of Program Effects, and Innovative Programs in Other States). Four regression models were run using all responding agencies as observations, and while the coefficients were all positive, which would indicate a positive correlation, the relationship failed to attain statistical significance in any of the four models. As noted above, given the lack of reported change, this is not surprising. To investigate further, though, the regression was repeated for each of the four variables by agency type (where possible due to limited responses) to determine if there are differences across agency types.

The results are presented in Table 9. Here we see that, while most agency types exhibit no relationship between budget distress and use of the four information sources, a few do demonstrate some relationship. For Alcohol and Substance Abuse agencies, there is a positive relationship between budget change and the use of evidence-based practices and scientific evidence, indicating that there is a direct relationship between budget and use of scientific evidence in these agencies. That is, as budgets grow, so grows reliance on EBP and SE. We see a similar relationship for Developmental Disabilities agencies and the use of EBP. For Fish and Wildlife agencies, the effect is observed for program evaluation findings and scientific evidence. For state police agencies, increased budget corresponded with increased use of program evaluation findings. And, interestingly, Vocational Rehabilitation agencies report a negative

effect where other agencies experienced a positive relationship. For Voc Rehab agencies, an increasing budget was met with reduced emphasis on EBP, PE, and SE. Said differently; a decreasing budget resulted in greater reliance on evidence in Voc Rehab agencies.

*

Table 9: The Relationship Between Budget Change and Reported Use of Four Information Sources

Table 6	Evidence Based Practices		Program Evaluation Findings		Scientific Evidence		Innov. Prog. In other States	
	Beta Coeff.	R-sq	Beta Coeff.	R-sq	Beta Coeff.	R-sq	Beta Coeff.	R-sq
Alcohol & Substance Abuse	.5*	0.34	0.26	0.2	0.49***	0.58	.02	.002
Children & Youth Services	0.05	0.02	-0.14	.07	-0.03	0.02	-.01	0
Developmentally Disabled	0.49**	0.33	.31	.13	0.12	0.02	-9E-18	0
Economic Development	-0.33	0.11	-	-	-0.33	0.11	.33	.11
Education	0.04	0	-.04	.002	0.04	0.002	-0.04	.002
Environmental Protection	0.17	0.08	.12	.04	0.09	0.02	.23	.10
Fish & Wildlife	0.08	0.03	.21*	.21	0.27**	0.27	-0.19	.10
Hazardous Waste Management	-0.67	0.33	-0.67	.33	-0.67	0.33	-0.33	.11
Medicaid	-	-	-	-	-	-	-	-
Natural Resources	0.19	0.15	.37	.32	0.23	0.1	.21	.09
State Police	0.14	0.04	.36*	.32	0.14	0.04	.14	.04
Tourism	-	-	-	-	-	-	-	-
Transportation & Highways	-0.22	0.1	-0.25	.09	-0.26	0.1	-0.08	.01
Vocational Rehabilitation	-0.32**	0.34	-0.35**	0.36	-0.24*	0.2	-0.2	.08

*= p<.10, **=p<.05, ***=p<.01, ****=p<.001

Note: These results are obtained from question 3.3, specifically asking how the change in fiscal resources impacts the search for each.

To conclude, tables 10 and 11 report the effect of inadequate resources and fiscal stress on the use of scientific evidence and on the importance of scientific evidence by agency type. For most agencies, inadequate resources reduce the use of evidence; natural resources and Medicaid are exceptions with positive values and five agency types report no effect (table 10). For all agencies except economic development, fiscal stress increases the importance of scientific evidence. This presents a conundrum for managers facing resource declines in that evidence is more important to inform decisions, but its use tapers off as a result of insufficient resources.

**Table 10: Mean Score for Effect of Inadequate Resources on Use of Scientific Evidence
(Range -1 to 1)**

	Effect of Inadequate Resources on Use of Scientific Evidence
Alcohol & Substance Abuse	-0.3
Children & Youth Services	0
Developmentally Disabled	-0.7142857
Economic Development	-0.25
Education	0
Environmental Protection	-0.2941176
Fish & Wildlife	-0.2
Hazardous Waste Management	0
Medicaid	1
Natural Resources	0.125
State Police	0
Tourism	0
Transportation & Highways	-0.25
Vocational Rehabilitation	-0.0666667
TOTAL	-0.1777778

Table 11: Effect of Fiscal Stress on Importance of Scientific Evidence of Effectiveness

	Effect of Fiscal Stress on Importance of Scientific Evidence of Effectiveness
Alcohol & Substance Abuse	0.2
Children & Youth Services	0.33
Developmentally Disabled	0.31
Economic Development	0
Education	0.4
Environmental Protection	0.125
Fish & Wildlife	0.47
Hazardous Waste Management	0.33
Medicaid	1
Natural Resources	0.22
State Police	0.18
Tourism	0.5
Transportation & Highways	0.25
Vocational Rehabilitation	0.13
TOTAL	0.27

Conclusion

In this paper, we have begun to explore the effect of fiscal stress on information acquisition behavior of state government agencies. The analysis to this point reveals that agencies searched more aggressively for information from a variety of sources in the aftermath of the Great Recession and the fiscal crisis it posed for state governments. Some information sources grew in importance. The biggest increases were from internal agency staff, comparable agencies in other states, research and formal evaluations, and the professional literature. In other words, the greatest increases in attention went to experience and formal knowledge.

In addition, patterns of use have changed. The factor analysis suggests that a more clearly delineated set of evidence-based source cluster together. There continues to be a political cluster, and the use of internal agency staff stands in contrast to the use of innovation sources. It also suggests varied effects of budgetary shortfalls on the demand for and use of evidence-based information sources.

We have much left to explore. The survey contains information on a wide variety of factors that might relate to affect, and be affected by information acquisition. It contains information on the availability of science to support an agency's decisions and the agency's use of scientific evidence to guide decisions, the changing demand for accountability, mandates for EBP, the political environment of the agency, performance management, and strategic planning. Thus, in subsequent analyses we will be able to model information acquisition as a function of the political and budgetary environment, as well as the management environment. Combining the survey with budgetary, political, and socioeconomic characteristics, we hope to examine the effect of context on agency information acquisition and the use of evidence-based practices.

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