Institute for Federalism & Intergovernmental Relations

IFIR WORKING PAPER SERIES

Evidence-Based Practice and the Use of Information in State Agency Decision-Making

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IFIR Working Paper No. 2009-10

April 1, 2009

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Abstract

The contemporary policy environment makes persistent demands on agency officials to use the best information available when making decisions about policies, programs, and practices. State and federal legislation calls on agencies to incorporate evidence-based practices in their programs. Using data from a 2008 survey of state agency administrators, we examine the extent to which state government agencies draw upon various sources of information to guide their decisions about programmatic operations. Our findings reveal the extent to which agencies rely on, or weight, scientific studies and formal evaluations compared to other sources. The paper offers new insights into the use of information, particularly scientific evidence, in state agency decision-making, offering the first systematic look at how widely such information is used.

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Introduction

The contemporary policy environment makes persistent demands on agency officials to use the best information available when making decisions about policies, programs, and practices. Indeed, legislation at both the state and federal level calls on agencies to incorporate evidence-based practices in their programs. Appealing to our desire for enhanced government performance and accountability, there is strong pressure to use practices for which effectiveness evidence is available. Public policy research has recently begun to examine the concept, thus far focusing on the ways evidence can be used or on ways to better use best practices. Even so, little is known about the prevalence of evidence use in policy decisions. Where is it being used? What sources of evidence are consulted? Are there differences according to the substantive policy area? These questions frame the present study.

Lack of agreement on what constitutes evidence across policy makers and administrators has led to many programs being labeled "best" or "evidence-based" when the quality of evidence or information itself is suspect. The quality of evidence available varies significantly, and reliability and validity concerns suggest the need for better understanding of the sources of information decision makers consult and how they value them.

We examine the extent to which state government agencies draw upon different sources of information to guide their decisions. In 2008, we conducted a national survey of agency administrators at twelve selected agencies in each of the fifty states: 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, and vocational rehabilitation. The responses are used to explore characteristics of various sources of information used by state agencies to inform

decisions about practice, policy and programmatic operations. Our focus is on determining how agencies view different types of information; specifically, we ask to what extent agencies rely on evidence from scientific studies and formal evaluations relative to other sources, and how they weigh information from different sources. We briefly provide background on evidence-based policy and practice before presenting our theoretical expectations, the survey methodology, our findings and a discussion of the results. The paper provides new insight into the use of information, particularly scientific evidence, in state agency decision-making, offering the first systematic look at how widely such information is used.

Background: Evidence Based Policy and Practice

Rebecca Maynard asked what it would take for decision makers to care about evidence regarding program effectiveness (Maynard, 2006). Her question was posed in the context of her acknowledgement that "…there has been a growing emphasis on evidence-based policy and practice throughout the United States and elsewhere around the world" (Maynard, 2006: 249). Thus, she seems to make contradictory claims—there is growing demand for evidence, but decision makers do not use it. Despite the apparent demand for evidence-based practice, we have not yet reached the point where evidence is "routinely and smartly produced and integrated into decision making" (249).

Indeed, we can document specific instances of laws that require the use of evidence-based practices and efforts to implement evidence-based practices. Currently, much of the focus of policy research is on generating evidence to inform practices, not analysis of the development or choice of practices by the implementing agencies themselves. With creators of such practices and evidence becoming more widespread, agencies' attention to and use of evidence in policy decisions is increasingly salient.

The demand for evidence-based practice stems at least in part from the same political impulses that have led to the widespread adoption of performance measurement and performance management systems by governments around the world. In the United States, performance measurement has become standard throughout federal, state, and local governments (Wang & Berman, 2000; Julnes & Holzer, 2001; Poister & Streib, 1999). Its adoption has been driven by a quest for results and efficiency. At root, it is an extension of a century long effort to rationalize government (Stone, 2002). The call for evidence-based practice can be viewed as part of broader social trends professionalizing various aspects of economic and social life. It is spawned by the growth of the middle class, increasing levels of education, and political pressure for governments to eliminate favoritism and spend the public's money wisely.

The literature on evidence-based practice is young and still developing. Eugene Bardach (2003, 2004) concentrates on best practices in two recent JPAM articles, but also discusses the value of evidence in those settings. Maynard (2006) notes that despite recent attention, "we are far from a world in which evidence is routinely and smartly produced and integrated into decision making" (249), in part because as evidence accumulates, it is more difficult to decipher (259). Maynard adds that it is not easy to determine what evidence is needed because "[t]he set of relevant questions change over time; an accumulation of evidence generally is necessary to have a major impact on policy, and social, economic, and political trends alter the policy agenda in important ways. In addition, more often than not, the relevant questions and their answers are both complex and sensitive to context" (251).

Assessments of why scientifically-based evidence should be used or how it should be used are widespread in the literature (e.g., Robinson, 2000; Cook and Ludwig, 2006; Cook, Shadish, and Wong ,2008; Greenberg, Michalapoulos & Robin, 2006;Bryson and Mowbry,

2005; Hall and Jennings, 2008). A much smaller set of studies examines the use of evidence in policy-making. The area where evidence-based policy and practice has flourished is public health, particularly in developing schedules for approved pharmaceutical use in public programs (Maclure & Potashnik 1997).

Robinson (2000) indicates that recent enthusiasm in labor market policy development in the USA and the UK does not seem to be based on the available pool of effectiveness evidence. Specifically, he finds new programs to be "a disappointing indication of a lack of evidence-based policy making" (25).

Boaz and Pawson's (2005) analysis of systematic reviews used to support policy and practice in mentoring programs reveals cause for pessimism; they observe that the explanatory scope of evidence is often more limited than its adopted use in policy decisions. As they put it, "fuzzy inferences are then dressed and delivered as hard evidence" (Boaz & Pawson 2005, 188).

Despite the apparent attention to evidence-based policy and management, it is not at all clear how wide or deep attention runs. There has been little or no attention focused on the state agencies that develop and implement policies that directly impact citizens' daily lives. No study to date has made an effort to determine the extent to which evidence is used in state agencies' selection of policies, practices and programs, or how it is utilized. While it is easy to identify anecdotal examples and lots of academic writing on the topic, there is little evidence on how many agencies and officials in which policy arenas are attending to evidence to shape policy and practice.

Expectations About Use

The press for greater rationality and professionalism in government has not been uniform, varying over time and across jurisdictions. We might expect the same to be true for evidence-

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based policy and management. In fact, if we view the development of evidence-based policy and management as a function of the same political, social, economic, and technological forces that create demands for rationality, efficiency, and economy in government more generally, we begin to get some leverage on where and when we might expect it to emerge (e.g., Brudney, Hebert & Wright, 1999; Julnes & Holzer, 2001). It ought to vary across governments, time, and functions.

Given strong forces of incrementalism and the difficulty of rationalizing decision-making, we would expect evidence-based policy to proceed slowly and haltingly, making limited penetration into decision-making. If evidence-based policy is grounded in scientific research, we should expect evidence-based policy and management to emerge in those areas of policy where there is the most scientific research on the consequences of programs and practices. It should also emerge more prominently in policy arenas where the questions are instrumental and agreement on ends is widespread. We expect some clear distinctions to emerge according to substantive policy areas, leading us to consider a representative cross-section of state agency types.

Jones & Baumgartner's (2005) theory of information processing suggests that attention is selective, that we tend to draw on one frame or another in considering a situation, and that friction keeps attention focused on one set of considerations instead of another. This has the result of shaping attention to different kinds of information according to the accepted frame. This suggests to us that scientifically-oriented agencies will be more attentive to scientific evidence than those that are not.

Scientific evidence, including the results of formal evaluations, is but one source of information used by public agencies to inform decisions. Such evidence competes with accepted understandings in agencies, political directives, best practice assessments from other agencies or

states, internal assessments, citizen demands, advice of consultants, reports of think tanks, and a

variety of informal evaluations.   In addition, there is a broad and varied understanding among

government administrators of what constitutes evidence in policymaking. Not all have the

products of scientific research in mind. For advocates of evidence-based practices, this suggests

the importance of standardizing definitions of evidence in such a way that allows for broader

interpretations to be assessed and compared across policy areas. Some organizations have taken

steps to clearly define what it means to be "evidence-based." For example, the Coalition for

Evidence Based Policy (2006) requires studies to meet rigorous standards. It takes its criteria

from an Office of Management and Budget (OMB) document, What Constitutes Strong

Evidence of a Program's Effectiveness, which specifies such items as:

- Adequate sample size
- Few or no systematic differences between the intervention and control groups prior to the intervention
- Low attrition, and little or no difference in attrition between the intervention and control groups
- Few or no crossovers between the intervention and control groups after randomization;
- Placebo controls, where appropriate
- Intention-to-treat analysis of study outcomes
- Valid outcome measures, preferably well-established tests and/or objective, "real-world" measures (e.g., arrest rates for a crime intervention)
- Blinded evaluators, where appropriate
- Preferably long-term follow-up
- Appropriate tests for statistical significance (in group-randomized trials, "hierarchical" tests that are based both on the number of groups and the number of individuals in each group)

Many policy areas are not well-suited to random control experiments and their evidence

base is just beginning to develop, offering far less rigor than that suggested by the OMB report.

Given these differences, the meaning of the term evidence-based may also shift across

substantive policy areas. Given this and our belief that there would be a strong bias in responses

if we just asked agencies if they used evidence-based practices or scientifically-based evidence

in decision making, we adopted a strategy of examining the sources of information used by agencies and the importance they attach to those sources. Only some of these sources would provide studies meeting the OMB standard for evidence. This allows us to examine the use of evidence-based information sources in the context of a broader array of information activity.

The survey provides a very rich set of data about agency information seeking behavior and attention to sources of evidence-based practices. Here we focus on four substantive questions: (1) whether, and how often, agencies seek information or evidence to support program/policy decisions, (2) where agencies turn for information and evidence to support program/policy decisions, (3) how much weight various information sources and types of information and evidence receive, and (4) how information use varies by agencies' substantive policy focus.

Methodology: The Survey

The design of our survey began with a series of questions.

1. In developing or adopting new programs, policies and practices, do state agencies seek evidence?

2. Where do they seek it?

3. How do they prioritize it?

4. Is there variance by policy area or agency?

Given these questions, we developed an instrument that would provide data necessary for an empirical cross-sectional examination of 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 search for and use of evidence has to be understood in terms of a broader range of information and sources of influence on agency decision-making. Taking this into account, we chose to concentrate on sources of information, with an expectation that the quality of evidence varies significantly by source. Likewise, it is expected that the quality of information administrators consider to constitute evidence varies significantly. The effort to measure evidence use must take this lack of shared understanding into account.

We used scale measures to provide a meaningful range of variance for the questions in the survey. For example, on substantive question (1), whether the agency seeks program information from external sources, we provided a range of responses from never to very often. For substantive question (2), where they seek information, we provided a range of potential sources informed in part by the responses we received during our prior research and in part by our knowledge of current practice. Question (3) asks about the weights agencies assign to information from each source. The nineteen potential sources of information we include 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 list includes sources that are both internal and external to state government, formal and informal, political and apolitical, in an effort to broadly survey the range of interest in program evidence emanating from agencies of different types. Use of these broader sources is intended to contextualize agency use of evidence relative to other types of information and the varied attention it would receive in their decision-making. The source and weight are indicators of the relative influence each information source holds in agency decision making and provide an opportunity to examine variance among agencies operating in different fields of practice.

We received a total of 234 paper and electronic responses for an initial response rate of 39%. Of 234 responses received, we dropped a total of 17 to ensure reliability and validity, leaving a remaining total of 217 responses for analysis and a final response rate of 36.2%.[1] Response varied by state and agency type, as would be expected. In a given state, the number of selected agencies responding ranged from 2 (16.7%) to 9 (75%). Similarly, the number of states responding for each agency type also varied. Fish and Wildlife agencies were most responsive, with 54% responding, followed by state police (52%), and transportation and highways (48%); Natural Resources (14%) and Tourism agencies (16%) were the least responsive (Table 1). Appendix A provides additional information about the design of the survey.

Findings

There is considerable variation in the use of different information sources. Almost invariably, agencies look beyond their own walls for information to guide their program and policy decisions: 89.2% of agencies indicated they consult external information *often* or *very often*. 10.8% of responding agencies do so *sometimes* or *rarely*. No agencies indicated that they *never* consult external information. Agencies, of course, vary in the extent to which they look outside for information. Responses for each agency type were averaged to yield a mean score on the scale of 0 to 4, with 0 meaning *never* and 4 meaning *very often*. The average score across all agencies was 3.34, between *often* and *very often*. Children and Youth Services agencies reported the highest level of external information gathering (3.67), followed closely by Alcohol and Substance Abuse (3.57) and Tourism (3.57) agencies. Only one agency type, Hazardous Waste Management, scored below 3, indicating a range between *sometimes* and *often*. While these differences may appear important, one-way ANOVA reveals that between-agency differences are not statistically significant.[2]

We now turn to examine the extent to which agencies consult various information sources. Using a scale ranging from *never* (0) to *very often* (4), we asked respondents to indicate the degree to which their agency consults each source to inform policy and programming decisions. Even knowing the frequency with which agencies seek information from various sources tells us little about the value or importance of the information each source provides, although we would expect some relationship between the two. To capture perceived differences in information quality, respondents were asked how much weight they give the information available from each of the identified sources. Table 2 presents the results from all responding agencies by information source and provides one-way ANOVA results to determine if agencies of different types vary in their use of each source or the weight they assign it.

We first examine the frequency with which information from each source is used. Not surprisingly, the most consulted information source is the agency's own internal staff, with an average score of 3.55. The nearest competitor was comparable agencies in other states (3.13) as might be expected, given agencies' shared interests and meetings of associations that bring staff of agencies from across the country or within a region together to discuss common issues and concerns. Research and Formal Evaluations (3.00), Professional Literature (2.97) and Professional Associations (2.87) follow in frequency of consultation. On the opposite end of the spectrum, the News Media are *rarely* consulted (1.12), as are Think Tanks (1.45) and Innovation Award Programs (1.57). The ANOVA results reveal that agencies of different types do not vary in the frequency with which they consult professional associations, professional literature, innovation award programs, or legislative staff. All other sources show statistically significant between-agency differences.

The second half of Table 2 reveals the collective agency weightings by information source. Mean scores for each source were calculated as above, but the scale in this case is from *none* (0) to *very much* (4). As before, information from Internal Agency Staff carries the greatest weight (3.4). Looking beyond the agency walls, Research and Formal Evaluations score highest (3.2), followed by the Governor (3.12) and then Comparable Agencies in Other States (3.01). As before, information from News Media (1.23), Think Tanks (1.64) and Innovation Award Programs (1.79) receive the lowest weights in the range between *little* and *some*. The ANOVA results reveal that agencies do not vary in the weight they afford professional literature, innovation award programs, other state agencies, legislators, legislative staff or local elected officials. All other sources show statistically significant between-agency differences. It is reasonable to expect the value of information to be reflected in the frequency of its consultation;

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we examine this relationship next. Table 3 reveals the average weight assigned each source by agency type and helps to understand where agencies vary in their respect for information of different types.

It is conceivable that the combined weight and frequency of an agency's consulting an information source determines its true influence on agency programming and policy decisions, particularly given the logic that a valued source is more likely to be consulted. We used factor analysis to determine if there are relationships between responding agencies' consultation of sources and the weight they are assigned. Factor analysis further enables us to determine if there are underlying relationships among agency use of the 19 information sources we identified. Thirty-eight variables (the 19 sources used in question 2 and repeated in question 3) were subjected to a factor analytic procedure. 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 (Figure 1) suggested that four common factors were appropriate. In the following iteration we therefore retained only factors with eigenvalues greater than 1.6, which extracted four factors; this model had the advantageous result of every variable loading onto one of the four factors with no spurious or trivial loadings. Four factors explain 63.5% of the underlying common variance of the original variables (Table 4). Table 5 presents the factor loadings with secondary loadings suppressed for clarity.

The results provide important insight into agency utilization of various information sources. First, each of the 19 variables reflecting frequency of consultation loaded onto the same factor as its counterpart variable reflecting weight afforded for each information source across the four factors. This indicates, as would be expected, that agency consultation of an information

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source is highly correlated with the weight it places on the information available from that source. The second important insight is in the composition of the four factors. Common factors are meaningful in that they represent variance shared by the individual variables that load onto them. As Table 5 reveals, six pairs of variables loaded onto factor 1, which we have labeled *political sources*: Associations of government officials, governor, legislators, legislative staff, local government officials, and news media. Five pairs of variables loaded onto factor 2, suggesting the label *professional/scientific sources*: accrediting bodies, professional associations, professional literature, research and formal evaluations, and scientific studies. The link between professional sources and scientific studies likely reflects the central role accrediting bodies and professional associations play in studying or evaluating policies and practices and then disseminating information regarding those that do and do not work. In addition, many professional associations are the source of journals reporting the results of scientific studies. Five pairs of variables loaded onto factor 3, *agency/client sources*: internal agency staff, other state agencies, peer agencies in other states, federal agencies and interest groups. Three pairs of variables loaded onto factor 4, *sources of innovation*: consultants, think tanks and innovation award programs. Because the common factors are independent of one another, a high score on one information dimension does not preclude the possibility that agencies also seek other types of information reflected in the remaining common factors.

How do agencies differ in their use of information on this common scale? Do the agency differences observed in the underlying use and weight of information sources persist in these underlying common factors? Factor scores were generated to identify the extent to which agencies emphasize information from each of the four areas identified. ANOVA indicates statistically significant differences among agency types for each of the four common factors

identified. Table 6 provides the average factor scores for each agency type along with summary data and ANOVA results for each factor. Table 7 presents the factor scores by agency type in rank order to better convey differences among agency types. These data reveal interesting differences in agencies' information focus. The agencies scoring lowest on the *political* information factor are those from areas that are less politicized and more likely to have a base of scientific knowledge, such as vocational rehabilitation and alcohol and substance abuse, while the high scoring agency types are natural resources and economic development— highly politicized policy areas, and, in the case of economic development, an area lacking in scientific evidence of effectiveness.

Hazardous waste management and economic development agencies are found scoring lowest on the *professional/scientific* information factor, while alcohol and substance abuse, natural resources, and fish and wildlife agencies score highest. The *agency/client* factor is of least importance to economic development and tourism agencies while vocational rehabilitation, developmental disabilities and hazardous waste management agencies score highest. Agencies with strong substantive federal counterparts appear to score higher on this factor than do those with weaker federal support. The final factor, *sources of innovation*, sees less use in those policy areas where hard science and practice are well-established, such as fish and wildlife and environmental protection than in fields with a behavioral focus and a steady stream of programmatic innovation such as children and youth services and alcohol and substance abuse.

Most agencies reported scientific evidence to be commonly available. Nearly 90% reported that such evidence is *generally* or *sometimes available* while 10% reported that scientific information is *seldom* or *never* available (Table 8). Table 9 distinguishes these findings by agency type, revealing key differences among agencies in the perceived availability of

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scientific evidence. Economic development reports the lowest available scientific evidence, as expected. Tourism and fish and wildlife agencies report the highest availability of scientific evidence. We did not expect to find tourism agencies in this position, given our explanation that scientific evidence comes from formal experiments and quantitative studies. But, market research can be highly quantitative in nature and tourism professionals rely on data and projections from various sources including the *Journal of Travel Research*, the *Journal of Consumer Research*, *Tourism Management* and the *Journal of Travel and Tourism* as well as annually-published statistical reports based on survey data such as the *Travel & Tourism Market Research Handbook*. ANOVA reveals statistically-significant differences in availability of scientific information reported among the agency types considered (F=4.318, p<.001).

Discussion

This essay presents findings across agency types regarding agency use of information in policy and program decisions. The latitude of the project sheds considerable light on the prevalence of evidence-based practice in state agencies and how scientific evidence is used in conjunction with other sources of information and influence. Differences in agency type provide insight into where use of evidence in policy making and practice is likely to be found, and by extension, where additional effort is required to stimulate its development. Moreover, the characteristics observed will inform the use of evidence-based practice in other levels of governance. Future research may examine the manner in which information is integrated into specific policies, changes in the use of information over time, and potentially changes in the scientific sophistication of information users across agencies. While this study opens the door to understanding state agency information consumption, we have much yet to learn.

Notes

1. A few steps were required to ensure that each agency responded only once. The survey invitation sent to each agency contained a unique code that prohibited multiple responses through the electronic portal. However, given that paper response was optional, several instances of duplicates were encountered. In some cases, duplicate electronic responses were blank, indicating a false start, or were missing a significant number of answers; we deleted the less complete response (n=3). In other instances, both duplicates were mostly complete (or identical in one case), but one was missing one or more values versus the other. In these cases the less complete response was dropped (n=5). One pair of responses appears to have been initiated one day and completed another; the missing values corresponded perfectly between the two, so the responses were simply merged into a new complete response (n=1). In the case of one agency, an electronic response was entered and five photocopies of the survey subsequently arrived by mail a month later. The paper copies were dropped (n=5). Of the remaining duplicates, with no substantive rationale for selection, the first response received was maintained and subsequent responses were dropped (n=3). Missing responses adjust the actual response rate for each item.

2. In approaching this survey, we were aware of the longstanding American State Administrators Project (ASAP) conducted by Deil Wright and colleagues at the University of North Carolina-Chapel Hill. Because ASAP questions administrators about use of innovations and their adoption of new paradigms of management such as "reinventing government," we wanted to ensure that our effort was not duplicating the existing survey. Wright and colleagues supplied us with the questionnaires from 1964 to 2004. We reviewed these survey instruments and found that the substantive content of ASAP was not comparable to our interest in decision making processes. We did, however, find questions pertaining to influence patterns and agency demographics to be useful in informing our questions and approach.

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Appendix A

Administration of the Survey

Building on this foundation and knowledge of the American State Administrators surveys, we developed a questionnaire that covered, as succinctly as possible, the wealth of information we sought pertaining to agency use of information in decision making processes. We generated a template of the survey and solicited feedback from a pilot group of three agency administrators working in three state agencies (Medicaid, Solid Waste Management, and Developmental Disabilities Council). We used the pilot test to ensure clarity of language and terminology as well as available question responses and formats. In particular, we looked for selection of "other" as a response option to determine items we may not have considered. We also examined open-ended responses with the same intent. With this feedback, we revised the instrument for substance, formatting, and space concerns.

To improve external validity and response rate, we included a broad range of agency types but also developed a parallel system of instrument distribution and response. The system included an initial mailing with a cover letter and a coded copy of the instrument linked to the specific agency and a postage-paid return envelope. Included in the letter was a discrete link to an online version of the survey to allow the agency to reduce response time and effort. Following the initial mailing, we conducted follow-up on a bi-weekly cycle by both mail and email to solicit responses necessary to ensure external validity. The Council of State Governments provided an electronic database of state agency administrator physical and electronic mailing addresses. The instrument was launched the week of February 11, 2008 and remained open for response until June 15, 2008.

Figures and Tables

Figure 1: Analysis of Scree

Scree plot of eigenvalues after factor
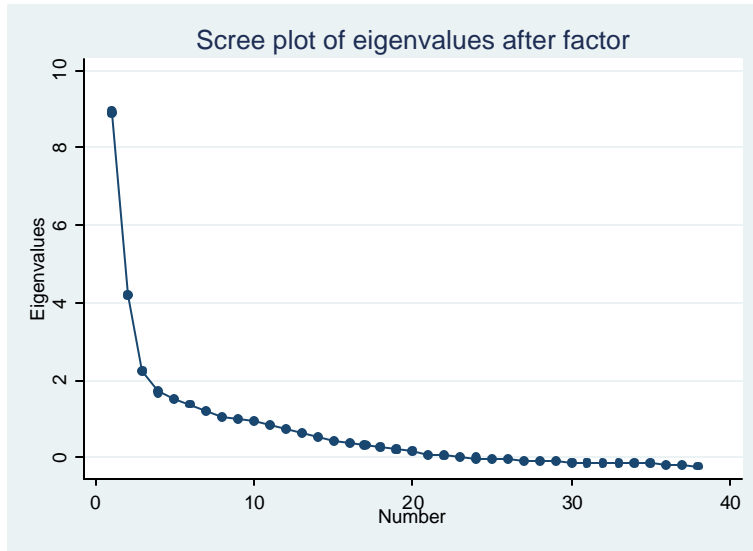
Table 1: Percent of Agencies Responding by Type

Agency	# of Agency Responses	# States Surveyed	% of Agencies Responding	Rank
Alcohol and Substance Abuse	21	50	42%	5
Children and Youth Services	21	50	42%	5
Developmental Disabilities	14	50	28%	8
Economic Development	15	50	30%	7
Environmental Protection	18	50	36%	6
Fish and Wildlife	27	50	54%	1
Hazardous Waste Management	13	50	26%	9
Natural Resources	7	50	14%	11
State Police	26	50	52%	2
Tourism	8	50	16%	10
Transportation and highways	24	50	48%	3
Vocational Rehabilitation	23	50	46%	4
	217	600	36.2%	-

Table 2: Average Score and Agency Differences for Each Information Source: Consultation Frequency (A) and Weight (B)

Information Source	A: Frequency of Consultation ANOVA: Between Groups Results			B: Weight Assigned to Information ANOVA: Between Groups Results		
	Mean Score	F	Sig.	Mean Score	F	Sig.
Accrediting Bodies	2.13	2.006	0.030	2.50	1.756	0.064
Professional Associations	2.87	1.292	0.231	2.78	2.132	0.020
Professional Literature	2.97	1.296	0.229	2.95	1.322	0.214
Research and Formal Evaluations	3.00	2.866	0.002	3.20	2.608	0.004
Scientific Studies	2.68	5.106	0.000	2.97	3.840	0.000
Consultants	2.25	5.824	0.000	2.43	2.219	0.015
Think Tanks	1.45	3.206	0.000	1.64	2.120	0.021
Innovation Award Programs	1.57	1.055	0.400	1.79	1.493	0.136
Internal Agency Staff	3.55	1.656	0.086	3.40	2.192	0.016
Other Agencies in Your State	2.63	1.932	0.037	2.66	0.875	0.566
Comparable Agencies in Other States	3.13	2.383	0.009	3.01	2.861	0.002
Federal Government Agencies	2.79	2.400	0.008	2.82	1.721	0.071
Associations of Government Officials	2.22	2.560	0.005	2.24	1.681	0.080
Governor	2.64	3.575	0.000	3.12	2.148	0.019
Legislators	2.33	1.985	0.032	2.74	0.495	0.905
Legislative Staff	2.08	1.176	0.306	2.30	0.871	0.570
Local Government Officials	2.05	2.094	0.022	2.24	1.261	0.249
Interest Groups	2.52	3.994	0.000	2.44	4.666	0.000
News Media	1.12	1.620	0.096	1.23	2.007	0.030

Table 3: Average Weights for Information Source by Agency Type

Agency Type	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	Governor	Legislators	Legislative Staff	Local Government Officials	Interest Groups	News Media
Alcohol and Substance Abuse	2.50	2.78	3.17	3.39	3.22	2.56	1.78	1.89	2.89	2.44	2.78	2.78	2.22	2.94	2.61	2.22	2.22	2.39	1.11
Children and Youth Services	2.47	2.89	3.05	3.37	2.95	2.47	2.11	2.05	3.32	2.68	3.16	2.79	2.47	2.95	2.74	2.47	2.16	2.58	1.05
Developmental Disabilities	2.54	2.38	2.77	3.00	2.77	3.08	1.31	1.31	3.31	2.62	2.77	2.77	2.08	2.46	2.23	2.00	1.54	2.92	0.92
Economic Development	2.23	2.54	2.69	3.08	2.08	2.62	1.77	1.69	3.31	2.77	2.54	2.15	2.38	3.62	2.62	2.46	2.69	1.54	0.92
Environmental Protection	1.87	2.33	2.53	2.80	3.40	2.20	1.33	1.67	3.53	2.67	3.00	2.87	2.47	3.53	2.87	2.13	2.47	2.40	0.73
Fish and Wildlife	2.55	2.95	3.41	3.55	3.64	2.14	1.32	1.55	3.68	2.55	2.82	2.64	2.05	2.82	2.73	1.91	2.18	2.86	1.23
Hazardous Waste Management	1.83	2.33	2.50	2.42	2.67	2.25	1.50	1.42	3.17	2.83	3.00	2.83	2.33	3.17	2.83	2.08	2.67	2.58	1.17
Natural Resources	2.43	2.57	3.29	3.43	3.43	2.29	2.43	2.14	3.43	2.71	2.86	3.14	2.57	3.00	2.71	2.57	2.14	2.86	1.43
State Police	3.04	3.08	2.96	3.29	2.63	2.00	1.54	1.83	3.63	2.75	3.33	2.71	2.00	3.25	3.00	2.58	2.33	2.08	1.79
Tourism	2.60	3.60	2.80	3.80	3.00	2.80	1.80	2.40	3.60	2.60	2.60	2.40	2.60	3.40	2.60	2.20	2.60	2.20	2.00
Transportation and highways	2.63	2.84	2.68	3.05	3.11	2.53	1.89	1.68	3.26	2.47	2.79	3.16	2.68	3.47	2.89	2.53	2.42	1.84	1.37
Vocational Rehabilitation	2.47	2.79	2.89	3.11	2.63	2.63	1.74	2.32	3.42	2.84	3.47	3.11	1.68	2.84	2.58	2.11	1.74	2.74	1.11

Table 4: Factor Analysis Summary

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	8.91277	4.73631	0.3326	0.3326
Factor2	4.17647	1.9475	0.1559	0.4885
Factor3	2.22896	0.53865	0.0832	0.5716
Factor4	1.69032	0.17921	0.0631	0.6347
…				…
Factor 38				1.00

LR test: independent vs. saturated: chi2(703) = 4473.73 Prob>chi2 = 0.0000

Table 5: Factor Loading Matrix (Varimax Rotation)

Variable	Political	Professional Scientific	Agency/ Client	Innovation
Associations of Government Officials (Consulted)	0.4165			
Associations of Government Officials (Weight)	0.4902			
Governor (Consulted)	0.7166			
Governor (Weight)	0.7207			
Legislators (Consulted)	0.7809			
Legislators (Weight)	0.7656			
Legislative staff (Consulted)	0.7387			
Legislative staff (Weight)	0.7283			
Local Government Officials (Consulted)	0.715			
Local Government Officials (Weight)	0.7545			
News Media (Consulted)	0.609			
News Media (Weight)	0.5821			
Accrediting Bodies (Consulted)		0.4384		
Accrediting Bodies (Weight)		0.5178		
Professional Associations (Consulted)		0.5053		
Professional Associations (Weight)		0.5555		
Professional Literature (Consulted)		0.7108		
Professional Literature (Weight)		0.7218		
Research and Formal Evaluations (Consulted)		0.6484		
Research and Formal Evaluations (Weight)		0.7227		
Scientific Studies (Consulted)		0.6803		
Scientific Studies (Weight)		0.7213		
Internal Agency Staff (Consulted)			0.4294	
Internal Agency Staff (Weight)			0.4406	
Other Agencies in your State (Consulted)			0.5271	
Other Agencies in your State (Weight)			0.5818	
Comparable Agencies in Other states (Consulted)			0.4823	
Comparable Agencies in Other states (Weight)			0.504	
Federal Government Agencies (Consulted)			0.3883	
Federal Government Agencies (Weight)			0.4925	
Interest Groups (Consulted)			0.5374	
Interest Groups (Weight)			0.608	
Consultants (Consulted)				0.6042
Consultants (Weight)				0.5184
Think tanks (Consulted)				0.6543
Think tanks (Weight)				0.6611
Innovation Award Programs (Consulted)				0.5192
Innovation Award Programs (Weight)				0.4191

Table 6: Factor Score results with agency differences and ANOVA

Agency Type	Factor 1 Political Mean	Std. Err.	Factor 2 Professional/Scientific Mean	Std. Err.	Factor 3 Agency/Client Mean	Std. Err.	Factor 4 Innovation Mean	Std. Err.
Alcohol and Substance Abuse	-0.214	0.234	0.278	0.195	-0.283	0.229	0.443	0.169
Children and Youth Services	-0.037	0.256	0.113	0.241	-0.029	0.232	0.488	0.197
Developmental Disabilities	-0.554	0.236	-0.408	0.261	0.298	0.232	0.330	0.203
Economic Development	0.531	0.253	-0.637	0.258	-0.685	0.318	0.151	0.300
Environmental Protection	0.083	0.219	-0.255	0.204	0.262	0.242	-0.694	0.221
Fish and Wildlife	-0.212	0.155	0.786	0.136	0.257	0.178	-0.809	0.226
Hazardous Waste Management	-0.075	0.256	-0.823	0.376	0.522	0.277	-0.018	0.224
Natural Resources	0.482	0.338	0.507	0.297	0.022	0.116	0.551	0.384
State Police	0.457	0.212	0.135	0.170	-0.267	0.154	-0.443	0.163
Tourism	0.284	0.400	0.205	0.271	-0.474	0.315	0.157	0.279
Transportation and highways	0.301	0.185	0.066	0.225	-0.445	0.202	0.331	0.159
Vocational Rehabilitation	-0.619	0.271	-0.291	0.200	0.619	0.204	0.253	0.185
Mean	-5.89E-10		9.17E-10		4.99E-10		-4.91E-09	
Std. Dev.	0.98		0.96		0.94		0.94	
Min	-3.04		-3.35		-3.53		-2.66	
Max	2.12		1.85		2.69		2.69	
ANOVA Between Groups Results:	F=2.52	p<.01	F=4.06	p<.001	F=3.16	p<.001	F=5.18	p<.001

Table 7: Agencies Rank-Ordered by Factor Scores

	Political F1 (Mean)		Professional/ Scientific F2 (Mean)
Vocational Rehabilitation	-0.619	Hazardous Waste Management	-0.823
Developmental Disabilities	-0.554	Economic Development	-0.637
Alcohol & Substance Abuse	-0.214	Developmental Disabilities	-0.408
Fish & Wildlife	-0.212	Vocational Rehabilitation	-0.291
Hazardous Waste Management	-0.075	Environmental Protection	-0.255
Children & Youth Services	-0.037	Transportation & Highways	0.066
Environmental Protection	0.083	Children & Youth Services	0.113
Tourism	0.284	State Police	0.135
Transportation & Highways	0.301	Tourism	0.205
State Police	0.457	Alcohol & Substance Abuse	0.278
Natural Resources	0.482	Natural Resources	0.507
Economic Development	0.531	Fish & Wildlife	0.786

	Agency/ Client F3 (Mean)		Innovation F4 (Mean)
Economic Development	-0.685	Fish & Wildlife	-0.809
Tourism	-0.474	Environmental Protection	-0.694
Transportation & Highways	-0.445	State Police	-0.443
Alcohol & Substance Abuse	-0.283	Hazardous Waste Management	-0.018
State Police	-0.267	Economic Development	0.151
Children & Youth Services	-0.029	Tourism	0.157
Natural Resources	0.022	Vocational Rehabilitation	0.253
Fish & Wildlife	0.257	Developmental Disabilities	0.330
Environmental Protection	0.262	Transportation & Highways	0.331
Developmental Disabilities	0.298	Alcohol & Substance Abuse	0.443
Hazardous Waste Management	0.522	Children & Youth Services	0.488
Vocational Rehabilitation	0.619	Natural Resources	0.551

Table 8: Availability of Scientific Evidence Across Agencies

	All Agencies (%)	All Agencies (#)
Never Available (0)	1.9%	4
Seldom Available (1)	8.1%	17
Sometimes Available (2)	48.8%	102
Generally Available (3)	41.1%	86
Total		209

Table 9: Descriptive Statistics by Agency: Availability of Scientific Evidence

	Mean	Std. Deviation	Std. Error
Alcohol and Substance Abuse	2.38	0.59	0.129
Children and Youth Services	2.00	0.79	0.178
Developmental Disabilities	2.14	0.77	0.206
Economic Development	1.57	0.94	0.251
Environmental Protection	2.56	0.51	0.121
Fish and Wildlife	2.67	0.48	0.092
Hazardous Waste Management	2.17	0.94	0.271
Natural Resources	2.57	0.53	0.202
State Police	2.04	0.47	0.099
Tourism	2.71	0.49	0.184
Transportation and highways	2.54	0.51	0.104
Vocational Rehabilitation	2.18	0.66	0.142
Average	2.29	0.70	0.048

*ANOVA reveals significant between group differences (F-4.318, p<.001)

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