

ORGANIZATIONAL CLIMATES OF INNOVATION ACROSS FEDERAL STATISTICAL AGENCIES

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Abstract¹

Using data from an organizational climate survey of government statistical agencies, this paper reports on the current climate of agency innovation within the Federal Statistical System. The four factors contributing most toward a strong innovative climate include: management's value of creativity, strong encouragement of innovation (even if risk is involved), openness to new ways of doing things, and consideration of opinions (regardless of rank.) Currently, the climate of innovation is stronger at some statistical agencies than at others. The perceived climate of agency innovation is found to have a strong, statistically significant effect on agency-level satisfaction ratings.

The NPR and Climates of Innovation and Change

In 1993, the Clinton Administration created the National Performance Review (NPR) to reinvent a Federal government that "works better and costs less." Two of the guiding principles behind the NPR are: 1) cut red tape and 2) empower employees to get results. Between 1994 and 1995, Federal agencies worked with the administration and Congress to begin implementing recommendations of the NPR.

The NPR goals were communicated to the Federal work force via videos, interactive CD-ROMs, newsletters, conferences, and electronic interchanges including e-mail and the internet. The initiatives and recommendations of the NPR were largely accomplished by interagency task forces, internal reinvention teams, reinvention labs, and government summits and conferences.

In practical terms, cutting red tape and empowering employees means replacing regulations, policies, procedures and layered decision making with innovation, line-level decision making and incentives for risk-taking. The NPR encouraged managers to grant subordinates as much freedom in decision making as possible. Federal workers were encouraged to use "common sense" tools to affect change, and government

leaders were challenged to transform their agency's culture by inspiring innovation and rewarding risk-taking.

Moving a traditionally hierarchical bureaucracy toward one of employee empowerment isn't easy. To do so requires strong managerial commitment to subordinate decision-making delegation, the elimination or reduction of old policies and procedures, and often a realignment of organizational structures. Historically, such changes are difficult in a multi-level, stovepipe bureaucracy operating under sometimes arcane and outdated procedures, rules, and policies.

There is no doubt that the NPR received a good deal of media attention and that there are numerous "success stories" to date (in fact, the Census Bureau has been the recipient of several NPR "Hammer" Awards and Customer Service Excellence awards.) Nonetheless, it is difficult to quantify the impacts of the NPR from an organizational culture standpoint. Have the NPR concepts really filtered down to line-level agency employees within the Federal Statistical System? How does one go about quantifying an agency's organizational climate of innovation? Finally, how do agencies in the Federal Statistical System currently rate in terms of innovation and does this climate affect agency-level satisfaction?

What is organizational climate?

Research and theory on organizational culture vary widely across the management science, sociological and psychological literature. Social exchange theorists tend to define organizational climate along dimensions of perceived organizational support (Eisenberger and Huntington 1986; Eisenberger, Fasolo, and Davis-LaMastro 1990). They hypothesize that employee perceptions are formed by how supportive they view the organization to be. The perception of support is influenced by the same type of processes used to judge support in social relationships (Blau 1964). In the organizational context, these processes translate into things like the organization's handling of employee illnesses, personal difficulties, superior performance, mistakes, pay of fair salary, and fair promotion.

Payne and Pugh (1976) subscribe to a more structural functionalist approach advocating that organizational climates arise from the objective realities resulting from the structure of the organization (e.g., size, centrality or decentrality of decision making, level of management hierarchies, and degree to which

¹This paper reports the results of research prepared by Census Bureau staff. The views expressed are attributable to the author and do not necessarily reflect those of the Census Bureau.

policy/procedures constrain behavior). Litwin and Stringer (1968) describe organizational climates multidimensionally using nine subcategories: structure, responsibility, reward, warmth, support, standards, conflict, identity and risk.

For the purposes of benchmarking organizational climate in the Federal Statistical System, this paper focuses specifically on two conceptually distinct organizational climate subcategories: 1) the innovation climate and 2) the support climate. Using the organization as the unit of analysis, I first measure and compare each agency's innovation and support climate "scores". Next, I explore whether either of these dimensions has a significant effect on the overall agency "satisfaction". Finally, I discuss how these findings relate to the NPR and future organizational climate surveys.

Methodology

In order to measure the innovation climate in statistical agencies, I used data from the 1996-1997 Survey Practicum from the Joint Program in Survey Methodology (JPSM) at the University of Maryland. The Practicum conducted an organizational climate survey of employees in nine Federal agencies. These included: Bureau of the Census (BoC), National Agricultural Statistics Service (NASS), Economic Research Service (ERS), Energy Information Administration (EIA), Bureau of Transportation Statistics (BTS), Bureau of Justice Statistics (BJS), National Science Foundation (NSF), National Center for Education Statistics (NCES), and the Bureau of Economic Analysis (BEA). With the exception of temporary workers and field interviewers, the survey attempted to distribute a questionnaire to all employees within each agency.

While the participating agencies had previously been the subject of their own climate surveys and/or employee opinion surveys, the '96-'97 Practicum was the first time a common climate survey was administered across statistical agencies. The survey contained questions on a broad range of topics related to several different organizational dimensions. Since the survey was intended to measure organizational-wide concepts, respondents were instructed to answer questions based on the experiences of the overall climate in their agency rather than from an individual perspective. Since the Practicum was the first time a common survey instrument has been administered to this population, the measures serve as benchmarks, not an impact assessment of the NPR.

Data collection occurred between January and April of 1997. For the five largest agencies, the data were collected under a split-panel design using a combination

of mail survey (paper and pencil) and electronic mail (e-mail) questionnaire. The other agencies' data were collected by a single mode (e-mail only or mail only). The data collection methodology included a prenotice letter from the agency head, a prenotice letter from the JPSM, the survey questionnaire (mail or e-mail), a follow-up postcard (or e-mail), and finally, a telephone follow-up reminder.

Response rates varied across agencies from a low of 51.6% to a high of 71.8%. All agencies combined, 4,834 employees responded for an overall response rate of 56.9%. The mail response rate was significantly higher than the e-mail (70.2% versus 42.9%; see Treat, 1997 for a discussion of the mode differences). Both panels are combined for purposes of this analysis.

Operationalization of Innovation Climate

To operationalize the climate definition of innovation, I focused on questionnaire items similar to those originally proposed by Amabile (Amabile 1983, 1986 and 1988; Amabile and Gryskiewicz, 1987; Hennessey and Amabile, 1988) and later modified by Witt and Beorkrem (1989). Witt and Beorkrem's measure identified nine organizational characteristics that influence and promote innovation and creativity: 1) freedom to decide work assignments, 2) good project management, 3) sufficient resources, 4) encouragement of new ideas, 5) organizational norms of cooperation, innovation, and freedom to fail 6) recognition/reward of innovation 7) sufficient time to think creatively 8) challenging work and, 9) urgency/pressure from outside sources to accomplish something important.

The JPSM climate survey included 12 Likert scale (1-Strongly disagree 5-Strongly Agree) questions that corresponded to roughly seven of these nine innovation constructs. They include:

Employees have little to say about what assignments they receive; Management sets a good example; Managers have poor managerial skills; Employees have adequate resources to do their job well; The agency has too few employees to accomplish its goals effectively; Creativity and innovation are valued; Top level managers disregard employee ideas for improvements; A spirit of cooperation and teamwork exist in the agency; Supervisors/team leaders are open to new ways of doing things; Employees are encouraged to try new ways of doing things, even when there is some risk of failure; It is difficult to get things changed in the agency; and, Red tape and unnecessary rules interfere with completing work on time.

Operationalization of Organizational Support

I also analyzed 13 questions hypothesized to reflect

the organizational climate of support. These were based loosely upon a subset of support categories from Eisenberger's (1986) Survey of Perceived Organizational Support (SPOS). They included: 1) organizational concern about fair pay, 2) the employee's well-being, 3) response to possible complaints, 4) response to special favors, 5) opportunities for promotion, and 6) consideration of employee goals and opinions. The specific questions reflecting these support categories are:

My pay is fair for the work I do; Management looks after employees' interests; The agency does not seem concerned about its employees' futures; Employees who take time off for family, medical or personal reasons hurt their career opportunities; Supervisors/team leaders try to accommodate employees' needs to deal with family and/or personal responsibilities; The agency has effective programs to help with personal and family responsibilities or problems; The agency's work schedule policies try to accommodate employees' personal needs; Managers deal effectively with complaints about sexual harassment; Managers deal effectively with complaints about prejudice or discrimination; Opportunities for advancement in the agency are inadequate; Employee promotions are based on performance and qualifications; Top-level managers disregard employee ideas for improvements; and, Opinions are considered on their merit regardless of the employee's rank.

Operationalization of Agency-Level Satisfaction

The final construct of interest is an agency-level satisfaction measure. This scale was constructed using questions that addressed the overall well-being of the agency rather than individual perceptions and opinions of work satisfaction. They include:

How satisfied are you with the overall conditions in the agency? (very dissatisfied, dissatisfied, neither satisfied nor dissatisfied, satisfied or very satisfied.) Would you say the morale of agency employees is: very low, low, neither low nor high, high or very high? Would you say the quality of products and services provided by the agency is: very bad, bad, neither bad nor good, good, very good, or don't know? As an organization to work for, would you say the agency is: very bad, bad, neither bad nor good, good, very good or don't know?

To test whether the items represented the underlying dimensions of innovation, support, and agency-level satisfaction, responses to the 28 items by the combined sample of employees were analyzed initially by principle components method factor analysis followed by a

varimax rotation². Scores for items that were negatively worded were reversed before the analysis. Answers of "don't know" and missing values were recoded to the overall item mean prior to the analysis.

Results

The factor analysis revealed that some of the items correlated as hypothesized while others did not. The presumptive innovation factor (factor 1) had relatively high factor loadings with nine of the 12 items originally hypothesized to represent the climate of innovation. Three items (employees have adequate resources; agency has too few employees; agency has too much red tape) had relatively low loadings and were subsequently dropped from further analysis. An item previously not hypothesized to correlate with innovation (opinions are considered on their merit regardless of the employee's rank) was subsequently added to the innovation scale since it had a high loading and is somewhat related to Witt and Beorkrem's characteristic of encouraging new ideas. The innovation factor accounted for 32.5% of the standardized variance.

The second factor had relatively high loadings with the four items hypothesized to represent the underlying dimension of agency-level satisfaction. This factor accounted for a much smaller percent of the variance (6.0%).

The third factor (presumably the support dimension) had relatively high loadings on only four of the 12 items originally thought to represent it. All four dealt with the agency's accommodation with personal needs (family time off hurts career; agency accommodates personal problems; work schedule accommodates needs; agency has effective help programs). The remaining items thought to correlate with support had low loadings and were dropped from further analysis. The third factor accounted for approximately 5% of the total variance. Table 1 contains the item factor loadings after rotation.

Agency Climates of Innovation, Support and Satisfaction

Scale scores for organizational innovation, support, and satisfaction were constructed by multiplying item scores that loaded high on a respective factor by the factor loading and then summing the items. Table 1 contains the total mean scale scores and scores by agency. With the exception of the Census Bureau, the agency names are not displayed to maintain

² Varimax rotation is a technique commonly used to redefine factors in order to make sharper distinctions in their meanings (see Kachigan 1986, pp. 389-392).

confidentiality.

Table 1 indicates that the overall innovation climate score for the participating agencies is 17.1. By itself, this score is of little value since we lack any historical benchmark to compare against. Additionally, since the survey included only government organizations, we cannot say where Federal statistical agencies “rate” relative to their private-sector counterparts. We can, however, discuss the innovation, support, and satisfaction climates of government statistical agencies relative to one another.

Table 1 reveals that the largest degree of variation occurred for the innovation climate scores. Scores ranged from a high score of approximately 20.8 at Agency I to a low of 16.4 at the Census Bureau. The difference between the highest and lowest mean scale score was statistically significant ($t=-3.71$, $p<.001$) suggesting that the perception of innovation is stronger at some agencies than at others. This is important because it illustrates that even among government agencies, there are differences in the degree of perceived “bureaucratization.”

Less variation was found between the support scores (scores ranged from 9.8 to 10.8). Perhaps this dimension was perceived more uniformly across agencies since it consists of personnel-related topics that are largely regulated by the Office of Personnel Management (OPM) and standard for all Federal agencies (i.e., sick leave, family leave, employee assistance programs, etc.). While each agency has leeway in how it chooses to implement these policies, the basic provisions are similar. The difference between the highest and lowest support score was not statistically significant at the .01 level.

Agencies B and H “tied” for the highest agency-level satisfaction score of 9.9. Agency C had the lowest score of 8.4. The difference between the absolute highest and lowest mean score was statistically significant (Agency B versus Agency C, $t=13.1$, $p<.001$). In the section below, I explore the topic of agency satisfaction further to see whether the climates of innovation and/or support have any significant effects on it.

Innovation and Support as Predictors of Agency Satisfaction

The final analysis included a regression model with agency-level satisfaction as the dependent variable and the innovation and support measures as independent variables. This regression will indicate whether the innovation and support climates affect satisfaction and how strong these effects are. Individual background variables of grade level, gender and race were also included as controls. Grade level was originally available in three categories (1-11, 12-13 and 14+) and

was dummy coded such that grades 1-13 received a value of one and grades 14 and above a value of zero. Gender was coded such that females received a value of one and males zero. Race was dummy coded such that whites received a value of one and non-whites zero.

It is clear from Table 2 that the perceived climates of agency innovation and agency support both have strong, statistically significant effects on agency-level satisfaction. The model explains a sizable proportion of the variation in agency-level satisfaction ($R\text{-square}=.47$). Both effects are positive meaning that as an agency’s climate of innovation and perceived employee support increase, overall agency satisfaction levels increase as well. While both had significant effects, the innovation variable had the largest impact on satisfaction (Std. beta=.592).

This finding has encouraging implications regarding the NPR. That is, if the NPR efforts can be successful in fostering government organizational climates that are less-bureaucratic, more innovative and change-oriented, then agency satisfaction with overall conditions, morale, and quality of products/services can be expected to increase as well.

Favorable perceptions of how organizations support personal needs (e.g., family problems, support programs, work schedules, time off) also play a significant part in determining agency satisfaction, albeit to a lesser extent. None of the control variables (grade level, gender, and race) was found to have a statistically significant relationship with satisfaction (at the .01 level).

Conclusions

This paper attempted to accomplish three objectives: 1) quantify some of the organizational and management practices that can foster an innovative organizational climate, 2) determine a benchmark of the innovation climates within the Federal Statistical System that can be compared to future surveys, and 3) determine whether innovation is significantly related to agency satisfaction levels.

The factor analysis suggests that the innovation climate is perceived to be strongest where creativity and innovation are considered valued commodities, where supervisors are open to new ways of doing things, where employees are encouraged to try new things (even if risk is involved) and where employee opinions are considered on merit, regardless of rank. To a lesser extent, input to decide work assignments, strong management, effective teamwork, and ease in effecting change also underlie the perception of agency innovation.

Since the ‘97 Practicum was the first time an organizational climate survey has been administered to

statistical agencies, only part of this question can be answered. We don't have any pre-NPR measures to compare to nor do we have any private-sector statistical organizations to benchmark against. Thus, we'll have to wait for future surveys to make inferences about changes in innovation climates, the impacts of future reinvention efforts, and whether Federal agencies are more or less "bureaucratic" than their private-sector counterparts.

The data do, however, allow for between-agency comparisons. These comparisons suggest that the degree of perceived innovation is significantly higher at some agencies than at others. Therefore, even though the agencies may be similar in respect to the work they perform, the regulations they operate under, and to some extent, their organizational structure, the organizational climates are not all the same.

The regression model indicates that the stronger the innovation climate, the higher the agency-level satisfaction. This is true even when controlling for organizational support perceptions and individual-level background characteristics. This finding presents a challenge for government agencies which are not commonly thought of as having a pioneering and innovative organizational culture. However, if the NPR efforts toward decreased bureaucratization can strengthen the perceived organizational climate of innovation, then indirectly, it should bolster an increase in agency satisfaction and the quality of agency products and services.

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Table 1.

Mean Innovation, Support, and Satisfaction Scale Scores by Agency

Scale	Total	Census	Agency B	Agency C	Agency D	Agency E	Agency F	Agency G	Agency H	Agency I
INNO	17.1	16.4	18.8	16.5	17.8	17.8	17.3	17.1	18.5	20.8
SUPP	10.0	9.9	10.3	10.0	10.0	10.4	9.8	10.8	10.7	10.6
SAT.	9.1	8.8	9.9	8.4	9.5	9.3	8.9	9.4	9.9	9.2

Table 2.

Agency-Level Satisfaction Rating Regressed on Measures of Agency Innovation, Agency Support and Background Characteristics as Controls

Independent Variable	Unstandardized Coefficient	Standard Error	Standardized Coefficient
INNOVATION	0.251 **	0.005	.592
SUPPORT	0.176 **	0.013	.173
GRADE	-0.226	0.125	-.021
GENDER	0.100	0.045	.026
RACE	0.100	0.052	.023

Note: R-square = .47

** p < .001