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The Impact of Teams on the Climate for Diversity in Government: The FAA Experience

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16. Abstract

This study examined the effect of teamwork on diversity-related perceptions of the FAA workforce. Recent research suggests that one means of improving the diversity climate of an organization is through the implementation of teams. To assess this conjecture in the FAA, three measures of diversity climate perceptions were examined: employee perceptions of the agency's success in elimination of hostile work environment behaviors, success of the Model Work Environment plan, and personal support for the model work environment vision. Teamwork and organization were examined, controlling for minority status, gender, age, supervisory status, agency and job tenure, and work setting. The results suggest that working as a member of an occupational work team is related to improved perceptions of the diversity climate, but organizational differences do exist. Overall, it appears that the size of the relationship between teamwork and diversity climate is influenced by the degree to which the survey measures focused on specific behaviors versus higher-level judgements. Specifically, behaviorally focused measures showed a stronger relationship with teamwork than did measures of support for the agency's diversity climate vision.

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The Impact of Teams on the Climate for Diversity in Government: The FAA Experience

The 1990s may well be remembered as the era of organizational implosion. In the private sector, some of the pressures that compelled companies to transform their organizational structures included increased competition in a global economy, escalated customer demands, and accelerated advances in technology (Boyett & Conn, 1991; Bowman & Kogut, 1995; Nadler, Gerstein, & Shaw, 1992). At the same time, public institutions faced declining confidence in government and citizens' simultaneous demands for higher quality services and lower taxes. In response, public institutions sought ways to become leaner, more decentralized, flexible and innovative (Osborne & Gaebler, 1992; Osborne & Plastrik, 1997; National Performance Review, 1993). Literature in both sectors asserts that changes in organizational structure should include, in many instances, replacing traditional hierarchical work structures with teams that oversee a "whole" part of the enterprise. These changes in organizational structure should go beyond using teams to solve organizational problems. Rather, the expectation is that organizations will establish a culture that supports teams as the central platform for accomplishing work (Mohrman, Cohen, & Mohrman, 1995; Boyett & Conn, 1991; Linden, 1994, Lawler, 1996; Hyde, 1997).

In addition to organizational structure change, the workforce in both sectors is steadily becoming more diverse, presenting employers with a second set of challenges. An expanding body of literature emphasizes that organizations must successfully manage diversity to gain the maximum potential contribution of their employees and to be competitive in today's environment (see, for example, Chemers, Oskamp & Costanzo, 1995; Rice, 1996; Thomas, 1991, 1996; Fernandez, 1991, 1999; Cox, 1994; Wilson, 1997; Norton & Fox, 1997). Public sector institutions have additional reasons to ensure that people of color and women are fully represented and included at all levels of government. These reasons have to do with the government's particular obligation to ensure that it is representative of the diversity of the nation (Krislov, 1974; Krislov & Rosenbloom, 1981; Federal Glass Ceiling Commission, 1995).

The question asked in this paper is: What happens to an organization when both increasing teamwork and diversity occur? Team-based work structures may have the potential to stimulate innovation and empowerment, but they also require a great deal of collaboration and mutual respect among co-workers (Tolbert, Andrews & Simons, 1995). The philosophy underlying the growing diversity management industry is that misunderstanding and conflict can and often do arise in a work group comprised of people from very different backgrounds. On the other hand, a growing body of literature suggests that ethnically diverse teams are often more creative and innovative than homogenous ones (Rogelberg & Rumery, 1996; Cox, 1994). For that inventiveness to emerge, however, requires more than passive tolerance of one another. Perhaps more importantly, some scholars have suggested that the converse is also true—the establishment of diverse-cross functional teams can foster a more inclusive environment for women and people of color than exists in a traditional, functionally based work structure (Irvine & Baker, 1995; Cox, 1994; Fernandez, 1999). This paper examines this latter presumption with the responses to a survey of Federal Aviation Administration (FAA) employees administered in 1997.

The FAA and Diversity

The Federal Aviation Administration is the largest agency within the Department of Transportation. The FAA provides a safe, secure, and efficient global aerospace system that contributes to national security and to the promotion of U.S. aerospace safety. Overall, the FAA workforce is less diverse than the federal workforce (see Table 1). Whereas women and minorities comprise 42% and 31% of the federal workforce (United States Equal Employment Opportunity Commission [EEOC], 1997), respectively,

Table 1.

Representation in the FAA in White-Collar Jobs by Race/Ethnicity and Gender, FY 1998 (percent)

	White		African American		Hispanic		Native American		Asian Pacific American	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
FG 1-8	12.7	55.6	2.7	16.7	1.8	5.7	0.4	1.7	0.7	2.0
FG 9-12	62.3	18.6	5.2	4.1	3.9	1.2	1.4	0.6	2.1	0.7
FG 13-15	68.1	15.0	4.9	3.0	3.8	0.9	1.4	0.4	2.1	0.5
SES	63.9	15.0	9.4	3.3	2.2	1.1	0.6	0.0	3.9	0.6
TOTAL	31,855	8,816	2,340	1,948	1,792	603	637	221	1016	323

Source: EEOC Form 568

the FAA workforce is 24% female and 18% minority. However, minorities hold a larger share of senior pay jobs in the FAA (21%) than in the federal workforce (12%). Women hold about the same proportion of senior pay jobs in the FAA as the federal workforce (about 20%).

In the early 1990s, the FAA took aggressive action to provide diversity training to all supervisors and managers. A number of different approaches were tried, and early on there was only limited coordination of these efforts. In 1994, steps were taken to develop a coordinated approach to diversity. A senior executive position was created to be the agency's "diversity advocate" and to oversee EEO and affirmative action responsibilities in the agency's Office of Civil Rights. A work group was created that developed a plan of action known as the "Model Work Environment" (MWE). The purpose of that initiative was to create and maintain a productive and hospitable work environment that reflects the nation's diversity (see Table 2.)

Since the MWE policy became official in 1996, the FAA took a number of steps to ensure its implementation. These included mandating specific performance standards for supervisors, managers, and executives; developing special efforts targeting underrepresentation, and revising the executive information system to include line of business demographics. The agency also now includes items related to MWE in the agency's biennial employee attitude survey. In fact, in response to the most recent survey (1997), nearly two-thirds of FAA respondents said they supported the FAA goals or principles related to the MWE to a great or very great extent (Thompson et al., 1999). The FAA, then, appears to have made considerable progress in creating the environment envisioned by the MWE initiative.

Teams in the Government

The notion that employee involvement can increase productivity, quality, and job satisfaction is not new. Since the 1940s, companies have experimented with different forms of worker participation. Efforts to emulate Japanese success in industry accelerated the adoption of quality circles and, later, quality teams in U.S. industries (Levine, 1995). During the 1970s and 1980s, experiments consistently showed that quality, innovation, customer service, and performance were substantially improved when employees had a greater role in organizational decision-making. Meanwhile, during the 1980s, economic pressures to simplify organizational structures and technological innovations that made it possible to push decision-making to lower levels in organizations added even greater impetus to the move toward "employee empowerment." Management consultants have confidently predicted that by 2002, "Teamwork and cooperation will be the basis for creating value in the new organization." Supervisors will be replaced by "enablers" who help employee teams manage interpersonal relationships and "technical support managers" who help them with technical problems (Boyett & Conn, 1991, pp. 6-7).

Table 2.

Definition of the Model Work Environment

MWE Vision Statement

A Model Work Environment is a productive and hospitable environment with at least four characteristics:

- All employees have the opportunity to develop their potential and contribute fully to the organization;
- The contributions of all employees are supported and encouraged;
- Discrimination and harassment in the work place have been eliminated; and
- The nation's diversity is reflected.

Source: FAA

In the federal government, the development of teams to replace traditional hierarchical work structures is arguably more difficult than in the private sector because of the laws and regulations that govern human resource management across the government. For example, hundreds of thousands of federal employees work within the general schedule system, which requires that they be individually categorized into one of several hundred narrow job classifications, paid according to a specific salary schedule, and evaluated based on their individual performance. When the National Performance Review (NPR) created "reinvention labs" and other mechanisms to encourage agencies to experiment with better ways to perform their work by granting them some exemptions from regulations, a number of federal agencies used this authority to create self-managed work teams.

A leading example is the New York Regional Benefits Office (NYBRO) of the Department of Veterans Affairs, which took advantage of this flexibility to reorganize its entire claims processing system. The agency created six self-managed teams and superceded the constraints of the classification system by collapsing 17 different position titles into three. Measures of individual performance were supplemented with measures of team performance. The NYRBO then applied to the federal Office of Personnel Management (OPM) under another program governing "experimental" human resource management systems for authority to replace the general schedule pay system with one that combines skill-based pay with a variable pay component linked to organizational outcomes (Alliance for Reinventing Government, 1999). At the Federal Aviation Administration,

a major impetus for this form of organizational restructuring grew out of a need to change some aspects of its organizational culture.

Teams at the FAA

A 1996 report by the U.S. General Accounting Office (GAO) examining the FAA's acquisition process blamed cost overruns ranging from 50 to 511% and schedule delays averaging nearly four years on a culture within the FAA that "did not reflect a strong commitment to mission focus, accountability, coordination, and adaptability" (GAO, 1996, p. 3). According to the GAO, the FAA, well aware of the problems being caused by its "stovepipe" organization, had begun a reform effort in November 1994. This effort, called the Integrated Product Development System, was based on using cross-functional, integrated product teams.

Meanwhile, in Section 347 of the Department of Transportation's 1996 appropriation bill, the FAA was directed to implement its own personnel management system. This change allowed the FAA to implement many personnel practices outside of the limitations imposed by OPM and existing personnel statutes. In response, the FAA altered its personnel management system with several specific goals in mind. Primary goals included: 1) acquiring, developing, and deploying people where they were needed, 2) developing more effective leadership and management, and 3) making the FAA a desirable place to work. In support of these objectives was the desire to develop human resource management systems that support the achievement of these goals, as well as ones that are efficient and adaptable (FAA office of Human

Resources, 1996). Within this broad framework, the FAA has increased the use of teams and teamwork where appropriate.

Some of the work performed by FAA personnel naturally lends itself to a team approach, while other work does not. For example, much of the work currently performed by air traffic controllers is individual in nature but requires cooperation and coordination among controllers in adjacent sectors. At a higher level of analysis, controllers really function as virtual teams, in that a given aircraft cannot complete its travel from one destination to the next without the coordination of a substantial number of controllers. The FAA's Research and Acquisition (ARA) organization, on the other hand, implemented specifically designed cross-functional teams. ARA developed teams to guide the development, testing, and final purchase of new aviation systems used to support the National Airspace System. The goal of these teams was to significantly reduce the development time and expense of large and complex purchases, as well as improve the functionality of the final product.

Diversity and Teams

Considerable research has concluded that diversity influences on a team's performance outcomes (Jackson, Stone, & Alvarez, 1993; Rogelberg & Rumery, 1996; Watson, Johnson, & Merritt, 1998). In many cases, ethnically diverse teams have been found to be more creative and innovative than homogenous teams (Rogelberg & Rumery, 1996; Cox, 1994; American Management Association, 1998; Jackson, May, & Whitney, 1995). In one experimental study where teams were given a male-oriented task, the quality of the decision reached increased as the proportion of men increased; however, the team that included one woman outperformed the others (Rogelburg & Rumery, 1996).

Positive outcomes of diverse teams are by no means guaranteed. The "similarity-attraction paradigm" suggests that individuals are more attracted to people like themselves and less attracted to those who are different. Consequently, a more diverse group is likely to be less cohesive and to have a more negative climate (Mayo, Meindl, & Pastor, 1996). Cohesiveness, in turn, affects job satisfaction, absenteeism, attrition, and performance (Jackson, Stone, & Alvarez, 1993; Jackson et al., 1991).

Another axiom guiding research in this area is the theory of relational demography, which proposes that an individual's demographic similarity or dis-

similarity to the composition of his or her social unit affects that person's work-related attitudes and behavior (Riordan & Shore, 1997; Tsui & O'Reilly, 1989). Following this theory, demographically distinct individuals who join an existing group are handicapped because the social identities of all involved become more salient, which, in turn, triggers stereotypes and more anxiety on both parts.

Raghurman and Garud (1996) identified three mechanisms that propel the dynamics of diverse groups—behaviors (exit and voice), affect (trust or distrust) and perception (of equity or inequity). They suggest that a group is likely to be more effective and cohesive when they have *diverse skills* to bring to the task at hand, but *share common work-related values.* However, difficulties presented by a diversity in values can be mitigated through the exercise of "voice" and "exit." Voice means providing forums for communication so team members can express concerns and seek clarification. Exit means allowing a group to regenerate itself through reconstituting its membership.

Structuring tasks to require interdependence is also important in encouraging team cohesion. This interdependence should be reinforced by mechanisms that affirm collective accountabilities and impel team leaders to fully develop team members, such as appraisal and reward systems based on team, rather than individual outcomes (Jackson, Stone, & Alvarez, 1993; Irvine & Baker, 1995; Kossek, Zonia, & Young, 1996; Gardenswartz & Rowe, 1994).

With attention to such mechanisms, some scholars have suggested that the establishment of diverse, cross-functional teams may in fact *foster,* rather than *impede,* the inclusion of minorities and women in organizations. Social identity theory proposes that people's self-identification is determined, at least in part, by their membership in groups (Riordan & Shore, 1997). Two of the groups with which people naturally identify are their racial, or ethnic group, and their gender. It is for this reason that the inclusion of a demographically different person on a team, particularly if he or she is the only member of that demographic group on the team, can have the kinds of adverse consequences described above.

Irvine and Baker (1995) argued that the development of teams, particularly cross-functional teams, also has the potential to create *new* identity groups with which people can identify so that their identification with their racial, ethnic or gender group becomes less important. This is, partly, because,

according to social contact theory, increased contact among dissimilar groups can help to break down stereotypes and generate greater attraction.

Membership on the same team would presumably increase contact among its diverse members, particularly when work is structured to require interdependence (Pettigrew & Martin, 1987). Social contact theories hold that greater contact among individuals reduces individuals' tendency to hold negative stereotypes about members of particular groups (Tolbert, Andrews & Simons, 1995; Maluso, 1995). Irvine and Baker (1995) proposed that diverse, cross-functional teams can increase individuals' attachment to the team and organization and foster positive work group relations. Increased attachment and a positive work environment, in turn, augment those individuals' own job satisfaction, motivation, and performance, and lower conflict and turnover. The organization, then, benefits from increased productivity and a reduced financial impairment that is associated with turnover.

Cox (1994) also suggests that reducing intra-group conflict is a reason that many organizations are shifting to team-based work structures; properly structured teams can eliminate power imbalances systematically related to gender and/or race/ethnicity that are the source of much inter-group conflict. Thus, in addition to providing the benefits of organizational flexibility and innovation, the development of cross-functional teams may also reduce inter-group conflict and provide new opportunities for women and minorities. The question asked in the present paper is: What effect, if any, has the shift to team-based work structures had on the climate for diversity in the FAA?

METHOD

Survey Procedures and Participants

A survey was mailed to all full-time permanent and temporary Federal Aviation Administration (FAA) employees during October and November of 1997.

Surveys were mailed to the address used to distribute each employee's Statement of Earnings and Leave. Approximately 48,900 surveys were distributed to the FAA workforce. Of those, 25,004 usable surveys were returned, yielding a response rate of 51%. The survey was comprised of 119 items assessing organizational climate issues, 14 respondent demographic items, and a section for respondent comments. The survey is part of an ongoing assessment of the FAA's climate, initiated in 1984. (For more detail, see Thompson et al., 1999).

Measures

Independent Variables. The topic of interest in this study is respondents' involvement in teams. Two variables were used to examine such involvement. The first measure was respondents' answers to an item on the survey that asked them about the amount of time they spend working in an occupational work team (see the Appendix for details). They were asked to select one of five options labeled from 0-5%, 5-25%, 25-50%, 50-75%, or greater than 75%. From these, only the low (0-5%) and high (75% or more) respondents were included in the analysis to create a clearer distinction between those who are very much involved in teams and those who have little involvement (n=13,367).

The second variable, FAA organization, takes into consideration differences in the type and coordination of work that occurs, based on occupational specialty within the agency. Some FAA organizations have made specific efforts to implement teams, and teamwork, such as the integrated product teams in Research and Acquisition described above. Others organizations have naturally occurring occupational work teams due to the nature of the work[1]. In the multivariate analyses that follow, an ordinal variable (called "organization") is created based on the proportion of the workforce in each organization that reports working in an occupational work team. Very small organizations were eliminated from the analyses

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[1] Currently, there are six major lines of business in the FAA: Air Traffic Services (ATS), Regulation and Certification (AVR), Research and Acquisition (ARA), Airports (ARP), Civil Aviation Security (ACS) and Commercial Space Transportation (AST). In addition, there is an administrative organization called the Region and Center Operations (ARC) organization. Finally, there are a host of staff offices that report directly to the FAA administrator, such as Civil Rights and Human Resources. Within each of these larger organizations, there are subordinate offices. For example, within ATS there are two major organizations, Air Traffic (AAT) and Airway Facilities (AAF). The former is comprised of air traffic controller specialists who ensure safety through the separation or aircraft and the provision of flight information to pilots, the latter ensures safety by maintaining the functionality of the geographically disperse ground based navigational systems. ATS makes up the largest organization within the FAA, having about two-thirds of all FAA employees.

(n < 50). This resulted in eight organizations being retained in the study. Respondents in the overall sample who did not report an organization, and those not in the low and high teamwork groups were eliminated from the analyses (with the one exception noted below).

Control Variables. Research has shown that a number of factors may be related to diversity perceptions. Therefore, given the large sample size in the present study, it seemed prudent to control for some of these in the present study. First, considerable research has shown that women and minorities are more likely to perceive disparate treatment based on sex or race than are men or are non-minorities, and more likely to support efforts to end such disparities (see, for example, United States Merit Systems Protection Board [MSPB], 1992, 1996; Naff 1995a, 1995b). Therefore, measures of respondent minority status (minority and non-minority) and gender were included as covariates.

Respondent age is another relevant variable. Given the increasing emphasis on teams and teamwork in educational settings over the last few decades, younger respondents may be more likely to be comfortable with teamwork than older workers. In addition, college campuses are also increasingly diverse, so younger workers may have more experience with diverse teams. Age was measured using a categorical variable grouped into approximately 10-year intervals.

Similarly, people with higher levels of education are typically more accepting of diversity than those with less education (Clayton & Crosby 1992). Respondent's level of education, as measured by six categories ranging from high school to graduate education, was included as a covariate.

Tenure is important because when a person entered both the agency and their current job influences how the respondent was socialized (Jackson, Stone & Alvarez, 1993; although Riordan & Shore, 1997, reported contrary findings). For example, in past decades the FAA had a very different socialization process for entry-level air traffic controllers, compared with the one being used currently (Broach, 1998). In addition, job tenure may be relevant in that persons who change jobs more frequently or have changed jobs recently, may be more likely to change individualized work behaviors and be more willing to work in a team. Tenure was measured by asking respondents to indicate their number of years with the FAA, and on their current job, respectively.

Research in the FAA (Thompson, Hilton, & Behn, 1997) has shown that, for many perceptual measures, executives and managers tend to provide more positive responses, compared with first-line supervisors and employees. Similarly, supervisors tend to report more positive perceptions, compared with employees. Therefore, it was determined that supervisory status should be taken into account.

Finally, opportunities to work in teams may be affected by the type of facility or location where one works. For example, it would be expected that in facilities or locations with more employees, there would be greater opportunities to work with a broader array of persons. In addition, some types of work are more likely to be addressed by teams, while others are more likely to be handled by individuals. Therefore, work setting was assessed by having the respondents indicate whether they worked at a 1) field office or facility, 2) the Washington headquarters, 3) regional headquarters, or 4) one of the agency's larger centers (i.e., Mike Monroney Aeronautical Center and the William J. Hughs Technical Center).

Dependent Variables. Three dependent variables served as proxy measures of the FAA diversity climate. Each measure is an index that combines responses to several survey items for which there are high inter-item correlations. The items that comprise each measure are presented in the Appendix. The first two measures assess the perceived effectiveness of the agency's efforts to create a better climate for diversity. The third measures respondents' personal support for these efforts.

The first dependent variable, eliminating a hostile work environment, assesses the prevalence of inappropriate behaviors in the workplace. These items were originally worded such that high scores reflected an increased level of perceived inappropriate behavior. For this analysis, they have been re-coded so that a high score represents low perceptions of inappropriate behavior. This measure provides an estimate of the level of inappropriate behavior that occurs in the respondent's immediate work environment, with items focused on behaviors occurring in that environment.

The second dependent variable is the perceived level of success the FAA has had in creating an agency-wide model work environment. These items covered specific behaviors as well as the availability of opportunities to participate in MWE activities. These items are included in the Appendix. This measure

provides an estimate of the respondent's perceptions of agency success with diversity beyond the respondents immediate work environment. (See Table 2 for a summary of the MWE goals.)

The third dependent variable is personal support for the Model Work Environment. This measure assesses the degree to which respondents support the principles and goals of the agency diversity efforts. The items assess the level of respondent support for programs and efforts included under the diversity rubric.

RESULTS

Prior to examining the dependent variables, teamwork differences in the FAA organizations are briefly summarized. The results of this analysis are presented in Table 3, with the organizations sorted in order from highest to lowest percentage of the workforce who indicated they spend 75% or more of their time as part of a work team. The table shows that the organization with the highest degree of teamwork (greatest proportion of respondents indicating 75% or more of time spent in teams) is Air Traffic. The organization with the lowest degree of teamwork is the Headquarters staff. Interestingly, Air Traffic Services also has the third largest portion of respondents indicating they spend less than 5% of their time in work teams. A close examination of Table 3 also shows that the first four organizations have a bimodal distribution of high and low team work. Specifically, the smallest percentage of respondents in these four organizations fall into the middle category of 25 to 50% of time spent working in teams. This result indicates extremes in the use of teamwork,

either high or low, for these four organizations. The last four organizations, on the other hand, have less than 25% of their respondents spending 50% or more of their time working in teams. This distribution of teamwork shows that there are organizational differences in the use of teams and teamwork in the FAA.

Analysis of the Control Variables

Prior to examining the impact of teamwork on perceptions of diversity, analyses were conducted to determine the degree of correlation among the covariates and the dependent variables. These analyses are summarized in Table 4. The table shows there are small, but statistically significant correlations between each of the dependent variables and the covariates, except for one. The results of this analysis suggest that non-minorities reported higher scores for eliminating a hostile work environment and MWE success, and lower scores on personal support for MWE. Similarly, males reported higher scores for eliminating a hostile work environment, and lower scores for MWE success and personal support for MWE. Level of education has the strongest relationship with personal support for MWE, suggesting that higher levels of education are related to greater support. Overall, the positive correlations indicate respondents with higher levels of education, who are older, and are a supervisor or manager are more positive for each of the three dependent variables. FAA tenure is not related to perceptions of eliminating a hostile work environment and is negatively related to perceptions of MWE success and personal support for MWE. This result suggests respondents who have been with the agency longer are less supportive of these efforts. Job

Table 3.

Percentage of the Organization's Workforce involved in Teamwork

	Less than 5%		5 to 25%		25 to 50		50 to 75		75 to 100%	
	%	n	%	n	%	N	%	n	%	n
Air Traffic	34.2	3570	12.0	1253	8.0	831	13.5	1414	32.3	3379
Research and Acquisition	19.0	171	17.4	157	13.3	120	21.1	190	29.3	264
Administration	24.7	445	19.0	343	13.9	250	17.0	307	25.3	456
Airway Facilities	29.3	1693	19.8	1143	15.6	901	16.6	959	18.6	1074
Regulation and Certification	30.2	937	22.5	697	17.3	536	16.4	508	13.7	425
Airports	31.8	100	24.2	76	18.5	58	12.1	38	13.4	42
Security	37.8	196	20.8	108	16.0	83	14.5	75	11.0	57
Headquarters Staff	43.3	107	20.2	50	13.8	34	12.6	31	10.1	25

Table 4.

Correlations Among the Covariates and Dependent Variables

Covariates	Dependent Variables		
	Eliminating a Hostile Work Environment	MWE Success	Personal Support for MWE
Minority	0.079*	0.027*	-0.054*
Gender	0.085*	-0.045*	-0.138*
Education	0.029*	0.021*	0.071*
Age	0.116*	0.127*	0.065*
Supervisory Status	0.178*	0.171*	0.180*
FAA Tenure	-0.010	-0.100*	-0.035*
Job Tenure	-0.106*	-0.213*	-0.166*
Work Setting	0.089*	0.204*	0.110*

* $p < .05$

tenure is negatively correlated with each of the dependent variables, suggesting that respondents with less tenure on their current job are more supportive of the MWE and perceive more improvement in the elimination of a hostile work environment. Finally, work setting correlations suggest that respondents in field offices and facilities are less likely to endorse each of the three dependent variables, compared with those in a headquarters or center setting. Overall, these results suggest that there is a benefit in controlling for these demographic variables.

Analysis of the Dependent Variables

To examine the overall effect of teamwork and organization on the diversity measures, and control for other factors that may affect attitudes about diversity, a multivariate analysis of covariance (MANCOVA) was conducted. The dependent variables were the three climate measures of diversity. The independent variables were level of teamwork (low and high) and the organization (ordered from highest proportion of workforce spending 75% or more of their time doing teamwork to lowest proportion of the workforce in that category). The remaining variables were entered as covariates. Using Pillai's criteria as the statistical criteria, the analysis indicated an overall effect of teamwork and organization on perceptions of the three dependent variables, $F(24, 30669) = 64.13$, $p < .001$. Given the significant overall MANCOVA, the interaction and main effects were examined. There was a significant overall teamwork by

organization interaction, $F(21, 30669) = 2.35$, $p < .001$. In addition, there was an overall significant main effect of organization, $F(21, 30669) = 26.99$, $p < .001$, and a significant main effect of teamwork, $F(3, 10221) = 9.52$, $p < .001$. These results indicate that, for at least one of the dependent variables, there are significant differences based on teamwork and organization. Given the significant overall test and the overall significant interaction and main effects, step-down analyses were conducted for each of the dependent variables. These analyses are discussed next.

Eliminating a Hostile Work Environment. The first dependent variable examined was respondent perceptions of how effectively the FAA had eliminated inappropriate behaviors in the workplace. That variable is called eliminating a hostile work environment. To examine this dependent variable in isolation, a step-down analysis of covariance was conducted. For this analysis, all of the covariates discussed above were included, and the main effect of teamwork and organization, plus the teamwork by organization interaction were examined. The results of this analysis are summarized in Table 5. The table shows that the covariates are significant, with the exception of work setting, indicating that there are differences in perceptions of the agency's ability to eliminate inappropriate behavior based on various demographic characteristics. Table 5 also shows, however, that there was a significant main effect of teamwork and a significant main effect of organization. The teamwork-organization interaction,

Table 5.

ANOVA Summary Table for Analysis of Eliminating a Hostile Work Environment

| Covariates	Sums of Squares	Df	Mean Squares	F	p
Minority Status	55.29	1	55.29	79.50	.000
Gender	90.97	1	90.97	130.81	.000
Education	9.04	1	9.04	13.00	.000
Age	31.98	1	31.98	45.99	.000
Supervisory Status	167.49	1	167.49	240.84	.000
FAA tenure	13.47	1	13.47	19.37	.000
Job Tenure	22.66	1	22.66	32.59	.000
Work Setting	1.89	1	1.89	2.71	.100
Independent Variables					
Teamwork	2.72	1	2.72	3.92	.048
Organization	98.47	7	14.07	20.23	.000
Teamwork by Organization	7.98	7	1.14	1.64	.119
Error	6850.17	9850	.70		
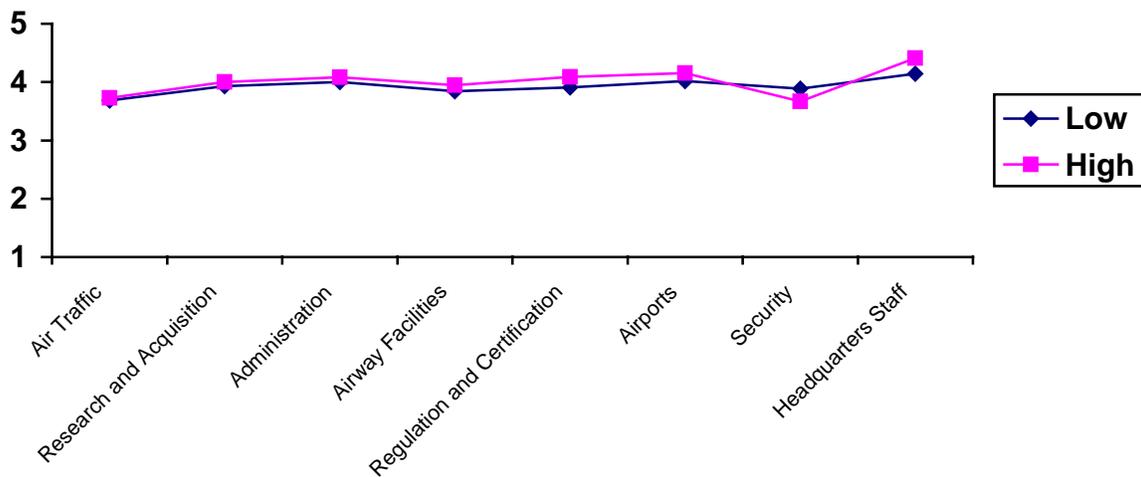
Figure 1. Adjusted Means for Eliminating a Hostile Work Environment, Comparing Low and High Levels of Teamwork for each Organization

however, was not significant. This suggests that perceptions of the FAA's success at eliminating inappropriate behavior does vary among its component organizations and is affected by the use of teamwork.

The main effects are summarized in Figure 1, which graphs the adjusted means for the eliminating a hostile work environment measure. Post hoc comparisons show that, when collapsing across the organization variable, the low teamwork respondents report lower levels of eliminating a hostile work environment compared to the higher teamwork respondents. When collapsing across teamwork, the post hoc analyses reveals that Air Traffic and Security had the lowest scores, while the Headquarters staff, Airports, and Administration organizations had the highest scores. The main effect of organization suggests there are organizational differences in perceptions of eliminating a model work environment. The

absence of a significant interaction indicates that there are no combined effects of teamwork and organization on perceptions of eliminating a hostile work environment.

Model Work Environment Success. The next dependent variable assessed was the respondents' perceptions of the success of the agency's model work environment effort. Again, a step-down ANCOVA was conducted in the same manner as described previously. The results of this analysis are summarized in Table 6. The only covariate to not reach significance was work setting; there was a significant main effect of teamwork and organization, but the interaction was not significant.

The main effects are summarized in Figure 2, which presents a graph of the adjusted means for perceptions of model work environment success. Post hoc comparisons show that when collapsing across organizations, the low teamwork scores for this variable were lower, compared with the high teamwork respondents, supporting the contention that teamwork contributes to improved perceptions

Table 6.

ANOVA Summary Table for Analysis of Model Work Environment Success

| Covariates	Sums of Squares	Df	Mean Squares	F	p
Minority Status	7.56	1	7.56	9.21	.002
Gender	122.99	1	122.99	149.79	.000
Education	3.40	1	3.40	4.15	.042
Age	28.57	1	28.57	34.79	.000
Supervisory Status	205.74	1	205.74	250.57	.000
FAA tenure	7.14	1	7.14	8.69	.003
Job Tenure	59.94	1	59.94	73.00	.000
Work Setting	.08	1	.08	.10	.749
Independent Variables					
Teamwork	13.23	1	13.23	16.11	.000
Organization	48.57	7	6.94	8.45	.000
Teamwork by Organization	11.19	7	1.60	1.95	.058
Error	8087.65	9850	.821		
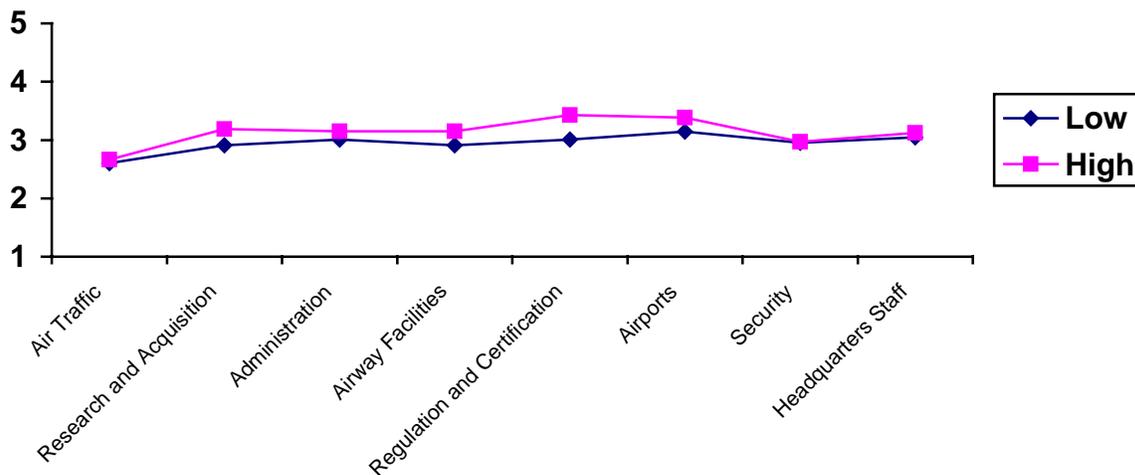
Figure 2. Adjusted Means for Model Work Environment Success Comparing Low and High Levels of Teamwork for each Organization

of diversity. When collapsing across teamwork, the post hoc analyses revealed that Air Traffic had the lowest scores, while the Regulation and Certification and Airports organizations had the highest scores. Again, the results indicate statistically significant differences in perceptions of MWE success across the organizations.

Model Work Environment Support. The final dependent variable examined was the respondents reported level of personal support for the agency's model work environment effort. Again, a step-down ANCOVA was conducted in the same manner as noted above. The results of this analysis are summarized in Table 7. In this analysis, all of the covariates were significant, with the exception of work setting, which approached significance. In addition, there was a significant main effect of organization and a significant main effect of teamwork. The interaction, however, was not significant. This pattern of results suggests that the respondents' perceptions of model work environment success differ based on the organization in which they work, and teamwork, but not the joint effect of the two independent variables.

Table 7.

ANOVA Summary Table for Analysis of Support for the Model Work Environment

| Covariates	Sums of Squares	Df	Mean Squares	F	p
Minority Status	6.72	1	6.72	8.17	.004
Gender	126.20	1	126.20	153.34	.000
Education	3.87	1	3.87	4.71	.030
Age	31.70	1	31.70	38.51	.000
Supervisory Status	211.95	1	211.95	257.54	.000
FAA tenure	6.57	1	6.57	7.98	.005
Job Tenure	64.08	1	64.08	77.86	.000
Work Setting	2.97	1	2.97	3.61	.058
Independent Variables					
Teamwork	13.78	1	13.78	16.75	.000
Organization	45.57	7	6.51	7.91	.000
Teamwork by Organization	9.51	7	1.36	1.65	.116
Error	8643.70	10503	.82		
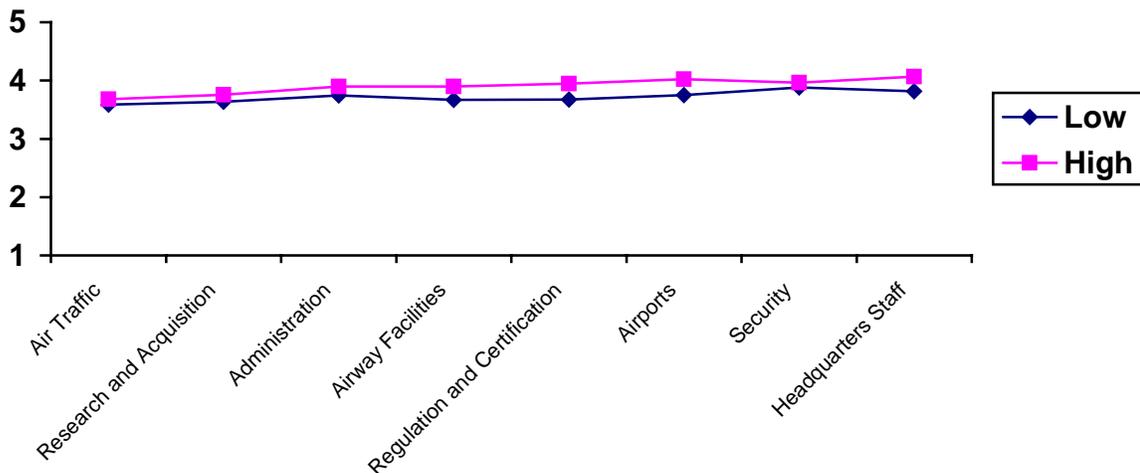
Figure 3. Adjusted Means for Model Work Environment Support Comparing Low and High Levels of Teamwork for each Organization

The adjusted means comparing the low and high teamwork groups for each of the organizations are presented in Figure 3. An examination of the figure and the post hoc analysis reveals that high teamwork respondents have a higher level of support for the Model Work Environment, compared with low teamwork respondents. In addition, the post hoc analysis reveals that Air Traffic and Research and Acquisition have the lowest scores on this measure, and the other organizations generally do not differ from each other.

DISCUSSION AND CONCLUSIONS

The results of this study lend some support to the proposition that involvement in work teams leads to a better diversity climate (as measured by employees' assessment of that climate) and greater levels of support for diversity-related initiatives. Teamwork seems to have the strongest relationship with attitudes in support of initiatives to create a better climate for diversity (in this case, the MWE). There is a weaker relationship between perceptions of inappropriate behavior and teamwork. This would suggest that the positive impact that teamwork has had on the diversity climate is largely centered in changing people's attitudes, rather than changing their behavior. Nevertheless, it is clear from this analysis that the choice of dependent variable is important when considering how improvement in a diversity climate is to be assessed.

The results also show that the relationship between teamwork and improvement in diversity is imperfect. For example, the Air Traffic organization has the lowest overall scores for each of the three dependent variables, yet, they have the highest self-rating of teamwork. Had teamwork provided the primary influence, the scores for Air Traffic would be the highest overall instead of the lowest. One possible explanation for this apparent inconsistency is the relatively homogeneous nature of the Air Traffic workforce, which is primarily non-minority male. As such, they probably are less likely to perceive hostility in the work environment, and are therefore less likely to see the need for efforts designed to improve that environment. However, it should also be noted that in previous surveys of attitudes and perceptions in the FAA, respondents in the Air Traffic organization generally report less positive attitudes and perceptions (with respect to job satisfaction) than members of other organizations. This finding suggests that future research should also take into account the organizational culture that can play a significant mediating role in the relationship between teamwork and the diversity climate.

The study also confirmed findings from previous research indicating that there are a number of other important demographic variables related to perceptions of diversity. In the correlation analysis, minority status, gender, education, age, supervisory status, organization tenure, job tenure, and work setting were related to the dependent variables, and in a predictable fashion. In the ANCOVA's, however, work setting did not emerge as a significant covariate. This suggests that, whether individuals work in a field location, headquarters, or other location does not contribute to the predictability of their attitudes toward diversity, controlling for the other factors. Overall, the effect of including the control variables in the models results suggests that the influence of organizational and individual differences on diversity perceptions is complex.

This study also points out some difficulties in conducting this type of research in a field setting. Specifically, due to the structure of the FAA, the numbers of employees who comprise the workforce in the various organizations vary substantially, as reflected in Table 3. In addition, the larger organizations also tend to be more geographically dispersed and to have a larger number of field facilities. While differences in sample size can be statistically controlled to some extent, this study did not control for employment in the various smaller work units and field facilities that make up the larger organizations. In addition, the large sample size in some of the organizations contributed to finding statistically significant results, while the effect sizes suggest the findings are of limited practical significance. Future research should take these factors into account.

While the effect of teamwork on the climate for diversity, as measured by this survey, was not a striking one, the results did support the proposition that there is a relationship between work arrangements and employees' attitudes. Given the increasing diversification of the workforce and the growing interest in shifting to team-based work structures, this analysis has made an important contribution in examining the link between the two.

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APPENDIX A

Items Comprising the Study Measures

Independent Variables

Teamwork:

<u>Definition</u>: An **OCCUPATIONAL WORK TEAM** is a group of more than two people who are viewed by coworkers as members of a permanent team, and who collaborate to solve technical and other everyday work problems.

Using the above definition, when performing in your main occupational specialty (e.g., controlling air traffic, flying, repairing equipment, inspecting aircraft), what percent of your time do you work as a member of an occupational work team?

  ⭘ 5% or less   ⭘ 5 - 25%   ⭘ 25 – 50%   ⭘ 50 - 75%   ⭘ 75 - 100%

Dependent Variables

Eliminating a Hostile Work Environment
Complaints about discrimination and harassment are not taken seriously by management where I work.
Sexual harassment is a problem in my workplace.
Jokes about women, people of color, etc. are common in my workplace.
To be a "part of the crowd" in my workplace, I have to go along with jokes about people of color, women, etc.

Model Work Environment Success
To what extent has the FAA done a good job:
...creating an environment where discrimination is not tolerated?
...creating an environment where sexual harassment is not tolerated?
...creating a productive and hospitable place to work?
...creating an environment where all employees have the opportunity to broaden their knowledge of the FAA (e.g., town hall meetings, attending briefings)?
...creating an environment where all employees have the opportunity to participate in developmental activities (e.g., details, training, task forces, special assignments)?
...creating an environment where all employees get the chance to fully contribute to meeting their organization's mission?

Model Work Environment Support
To what extent do you support FAA goals or principles related to:
...**Model Work Environment?** - Maintaining a productive and hospitable place to work.
...**Affirmative Action?** - Remedying under-representation due to past discrimination.
...**Equal Employment Opportunity?** - Protecting employees and applicants against discrimination.
...**Prevention of Sexual Harassment?** - Zero tolerance for sexually motivated, unwelcome acts that interfere with work performance.
...**Non-Discrimination?** - No discrimination on the basis of any characteristics not related to job performance.