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## Organizational Distance Scaling: Exploring Climates Across Organizations

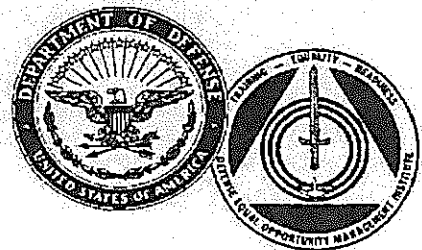
by

Major Rick S. Tallarigo, PhD  
Chief, Organizational Research Division  
Defense Equal Opportunity Management Institute

and

Dan Landis, PhD  
University of Mississippi  
Summer Faculty Research Fellow

June 1995



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Rick S. Tallarigo  
Defense Equal Opportunity Management Institute (DEOMI)

Dan Landis  
University of Mississippi

## **Abstract**

A multidimensional scaling (MDS) analysis was applied to organizational climate measures aggregated to organizational levels. The distances between organizations yielded a three-dimensional solution, and was interpreted using discriminant analyses. Organizational characteristics most predictive of climate differences included organizational mission, size, and several indicators of internal demographic composition. Implications and future research needs are discussed.

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## Organizational Distance Scaling: Exploring Climates Across Organizations

Rick S. Tallarigo  
Defense Equal Opportunity Management Institute (DEOMI)

Dan Landis  
University of Mississippi

**Organizational climate**, as a construct in industrial-organizational psychology, has undergone changes in its conceptual definition since the 1960's (Rentsch, 1990). Early literature described climates as mediating the influences of objective organizational properties on individual motives and behavior (e.g., Forehand & Gilmer, 1964; Sims & LaFollette, 1975). Later treatments argued that climate, due to its perceptual nature, was more indicative of **psychological climate** than organizational properties, assuming that climate could be measured independently from job or organization-related affect (Guion, 1973; James & Jones, 1974; Johannesson, 1973; Woodman & King, 1978). Lately, there has been renewed interest in cross-level analysis (e.g., how individuals' responses are related to macro-organizational characteristics)(Katzell & Austin, 1992). In climate research, this perspective is reflected in the question of how climate may be related to organizational characteristics. For example, Joyce and Slocum (1990) developed a theoretic typology in which climates covary with strategic positions (i.e., how organizations, through their leadership, adapt and change in response to their environments). Another example is Haverman (1993), who found that organizational size was related to the organization's ability to change. Although she did not measure climate perceptions, Haverman's (1993) findings may provide some basis for expecting that climate perceptions, to the extent they measure an organization's propensity to change, would be related to organizational size. The notion that climates should be differentiated on the basis of organizational characteristics is consistent with early and popular definitions of climate. For example, Forehand and Gilmer's (1964) definition emphasized the cross-organizational requirement that climate "distinguishes the organization from other organizations" (p. 362). Relatively few studies, however, have performed cross-organizational climate analyses, focusing instead on intra-organizational relationships between climate and individual responses.

The purpose of this paper is to report on an initial exploration of relationships between organizational climates and independently measured organizational characteristics. The climates studied in the present study are climates for equal opportunity, measured in Department of Defense organizations. Conceptually, EO climate derives from the climate dimensions of reward orientation and consideration, warmth, and support (Campbell, Dunnette, Lawler, & Weick, 1970). Equal opportunity (EO) climate has been defined as "the expectation by an employee that work-related behaviors directed by others toward the person will reflect merit and not one's racial/ethnic group, gender, national origin or membership in any other minority group" (Landis, Dansby, & Faley, 1993, p. 211).

An initial consideration for this study concerned the appropriateness of aggregating individual perceptual scores. Criteria for determining "collective climate" (Joyce & Slocum, 1984) include demonstrations of mean differences between organizational groups, relationships to organizational or individual criteria, or agreement of perceptions within organizational units. We found that our data, when aggregated, produced meaningful zero-order correlations with measures of organizational mission, structural level, size, and demographic composition patterns. In addition, previous research using military organization (Jones & James, 1979) found that units of approximately the same size as ours were ideal for climate homogeneity.

Based on these initial findings, we expected to find that organizations differing in terms of size, mission, level, and demographic patterns will have differentiated climates.

## **Method**

Our approach was to use Euclidean distance modeling with metric multidimensional scaling (MDS) to uncover the dimensions along which organizations differed on EO climate. MDS is an appropriate technique for uncovering the dimensions of similarity for sets of stimuli (Torgerson, 1957; Tzeng & Landis, 1978). In the present study, the stimuli were the aggregated responses of a large number of organizations. This approach is conceptually identical to the analyses of some thirty-plus language/culture groups studied by Osgood and colleagues (Osgood, May, & Miron, 1975; Tzeng & Landis, 1978).

### **Units of Analysis**

Organizations, rather than individuals, served as subjects of study. The organizations had a modal population of 50 members (median = 102; N = 955), and represented all branches of the military services, both active and reserve. Membership within the organizations spanned all ranks, and included those in combat as well as support roles. Demographically, the organizations were approximately 80% male and 60% majority (i.e. white).

### **Measures**

Organizations were surveyed with the Military Equal Opportunity Climate Survey (MEOCS). The MEOCS has undergone extensive field testing and psychometric evaluation, and consists of a battery of factor analytically derived scales measuring aspects of EO climate and organizational issues (see Landis, Dansby, & Faley, 1993). Coefficient alpha internal consistency estimates for the 12 scales ranged from .76 to .91. This study aggregated individual responses on five EO scales: Sexual Harassment and Discrimination, Differential Behaviors toward Minorities, Positive EO Behaviors, Racist/Sexist Behaviors, and "Reverse" Discrimination. In addition to climate perceptions, non-climate organizational characteristics were obtained by the researchers independently from survey respondents. These additional measures characterized each

organization in terms of branch of service, mission type (combat, combat support), geographical area, level of military command (e.g., brigade, battalion, wing, etc.), component (active, reserve), population size, the percentages of males/females, race/ethnic groups, categories of age and ranks, and percentages of those members in each organization who perceived themselves as victims of discrimination.

## **Analyses**

The analyses began with a calculation of the means on the five MEOCS scales for each organization. These means were then standardized with a mean of 0 and a standard deviation of 1, in order to remove unit idiosyncratic variances. We then calculated Euclidean distances in the five-dimensional space defined by the means. The matrix of distances was then subjected to multidimensional scaling procedures as implemented in the MDS program of Version 6.07 of SAS (SAS, 1992) and the resulting dimensions rotated using Varimax. Naming of the dimensions occurred as follows. First each dimension was dichotomized at its mean. Then a canonical discriminant function procedure was applied (Pedhazur, 1982) with unit characteristics as the predictors and the two groups as criteria. A single discriminant function was obtained for each MDS dimension. The unit characteristics which loaded at each end of the discriminant function were then used to name the dimension. Three such procedures were run, one for each dimension.

## **Results**

### **Determining the Number of Dimensions**

The MDS procedure produced three dimensions as determined by the pattern of eigenvalues and the level of the stress (or badness-of-fit) criterion. The first five eigenvalues were: 153.40, 92.70, 86.91, 45.07, and 25.67. Differences between the values indicated a sharp drop after the third dimension. The overall model stress was .10, which indicated a good level of fit (Davison, 1983).

### **Naming the Dimensions**

Table 1 provides the total sample standardized canonical coefficients. Table 2 presents the means of each of the significant criteria (i.e., organizational characteristics) for the upper and lower half of each dimension. Dimension 1 is characterized by large combat units whose members tend to report themselves as victims of discrimination and have somewhat low levels of organizational commitment and low perceived work group effectiveness. We might label this group as "alienated, low effectiveness victims." This dimension would seem to include non-minorities as well as minorities and women. The second dimension is clearly marked by high proportions of minorities who perceive their work groups as ineffective. Perhaps we can call this dimension "non-integrated and dispirited." Finally, the last dimension clusters organizations that are relatively small, have relatively low proportions of minorities, whose members see their work

groups as ineffective, and are likely to see themselves as victims of discrimination. We can speculate that this represents both majority individuals who feel discriminated against as well as minorities who feel isolated.

Table 1			
Total Sample Standardized Canonical Coefficients			
Variables	Dimensions		
	I	II	III
Mtype	.30	-.05	.20
Unit size	.28	.07	-.45
Victim	.47	-.17	-.92
PMIN	-.14	.66	.89
Commitment	-.42	-.15	-.20
WG Effectiveness	-.37	-.64	-.33
Satisfaction	-.06	-.11	.16

Table 2						
Means for predictor variables on split dimensions						
Predictor	Dimension					
	I		II		III	
	Low	High	Low	High	Low	High
Mtype	3.31	2.51				
Org Size	2.32	3.00			3.08	2.44
Pmin			35.13	42.59	37.45	32.64
Victim	41.70	52.03			42.13	49.27
Commit	3.58	3.09				
Effect	4.13	3.75	4.10	3.78	4.07	3.84
Satisf						

Note: All differences significant at P<.01 by Duncan Test

## Discussion

The results from this study suggest that cross-organizational differences in climate can be systematically related to “objective” or non-perceptual organizational characteristics. The three-dimensional solution resulting from MDS contained both organizational characteristics and internal demographic characteristics. Dimension I represented larger organizations fulfilling combat roles; Dimension II represented internal demographics of relatively high proportions of minorities; and Dimension III represented a combination of organizational and demographic effects (smaller organizations, largely white). The expected effect of organizational level (i.e., the rank of the commanding officer) did not appear.

While it is not possible to test the validity of the present solution without further analysis, the implications of these results are intriguing, considering the widespread use of organizational climate scores in survey feedback programs and organizational development efforts. In the private sector, for example, norms for climate survey results are often categorized by type of industry. In the public sector, the authors know of no such norm taxonomy. One implication from the present study is that when reporting norms for climate scores, relevant organizational contexts could provide useful comparative data. Moreover, the comparative framework may be empirically derived, based on organizational factors known to influence climate.

The generalizeability of the results to the private sector is of course limited by the Department of Defense mission of the participating organizations. The extent to which mission types can differentiate climates in the private sector is a matter for future research. For example, would similar results occur when contrasting manufacturing with service organizations? Other factors included in the present study, such as proportions of minorities or organizational size, however, are likely to have similar effects in private sector organizations.

Several areas for future research may be fruitful. One future research requirement is the further validation of the present results against new organizational data. Cross-validation of the model will become possible as additional organizations are added to the MEOCS research database. It would also be useful to confirm the MEOCS factor structure among organizations representing the 3-factor distance model. Do organizations representing different climate distance dimensions exhibit different EO climate factor structures? Finally, additional analyses to further validate and elaborate the present findings are planned. Examination of EO climate scores for the organizations marking the extremes of the MDS solution would help to clarify the nature of the climates as they relate to the various contextual factors. We might hypothesize that, for Dimension III, concerns about “Reverse” Discrimination or Sexual Harassment/Discrimination may be salient, in that the organizations on this factor have relatively low representation of ethnic minorities, yet relatively high incidence rates of victimization.

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