

PSYCHOMETRIC PROPERTIES OF THE  
MILITARY EQUAL OPPORTUNITY CLIMATE SURVEY

Robert D. Smither

Summer Faculty Researcher  
Defense Equal Opportunity Management Institute  
Summer, 1990

## Abstract

Two studies analyzing the psychometric properties of the Military Equal Opportunity Climate Scale (MEOCS) were performed. Study 1, scores on the five factor scales of the MEOCS were regressed against scores on Personal Perception of EO Climate and Others' Perceptions of EO Climate. Differential Command scores loaded most heavily on both perception scores, accounting for about 20% of the variance in each case. Reverse Discrimination score did not add significantly to the regression equation. In Study 2, scores on all 88 MEOCS items were correlated with total score to identify those items with the greatest predictive utility. Of the 29 most predictive items, 21 were from the Sexual Harassment subscale.

In 1963, the Department of Defense issued Directive 5120.36, which recognized that racial discrimination is harmful to the accomplishment of the military's mission. This directive also stated that it is the responsibility of unit commanders to eliminate unfair discrimination within their units. In later years, the DoD issued other documents relating to the elimination of unfair discrimination, including:

- o Department of Defense Human Goals Statement (June, 1976), which states the intention of DoD to become a model organization in terms of equal opportunity. Since 1976, the Human Goals Statement has been updated numerous times;
- o DoD Directive 1350.2 (April, 1987), requiring each service to institute a training program for equal opportunity and establishing the Defense Race Relations Institute, which, in 1979, was renamed the Defense Equal Opportunity Management Institute (DEOMI); and
- o DoD Instruction 1350.3 (February, 1988) which provides guidelines for the filing of affirmative action plans.

Although the military has a long history of measuring attitudes toward equal opportunity (e.g., Borus, Fiman, Stanton, & Doud, undated; Hiett et al., 1978; Nordlie & Thomas, 1974; Stoloff, 1972), this research has typically focused on relationships between Blacks and whites.

The Military Equal Opportunity Climate Survey (MEOCS; Landis & Fisher, 1987; Fisher, 1988; Landis, Fisher, & Dansby 1988a, 1988b) was developed as an extension of this research. According to Landis (1990), the MEOCS would advance the study of equal opportunity climate in three ways: (a) by providing a measure of perceptions about equal opportunity based on behavioral incidents rather than attitudes about race relations; (b) by relating perceptions about equal opportunity to organizational outcomes; and (c) by providing a Likert-type scale to assess the frequencies of the behavioral incidents.

Items for the MEOCS were developed by polling DEOMI staff members for their opinions about the types of behaviors that would indicate either positive or negative equal opportunity climates. The first version of the scale contained 71 items. A factor analytic study of responses collected in a field test of the MEOCS among DEOMI staff and students identified six factors that together accounted for 65% of the total variance in responses. These factors were:

1. Overall concern about equal opportunity;
2. Differential command behaviors;
3. Stereotypic behaviors;
4. Sex role definition;
5. Overt sexual harassment; and
6. Covert sexual harassment.

For a second test of the MEOCS at six military sites, several new items were added, bringing the total items of the scale to 88. At the same time, the six factors were reduced to five: Sexual Harassment/Discrimination, Differential Command Behaviors, Positive Command/Social Behaviors, Overt Racist/Sexist Behaviors, and "Reverse" Discrimination Behaviors. According to the final report (Landis, 1990), a total of 48 items loaded onto the five factors. Perception of equal opportunity climate, therefore, can be assessed across these factors.

In addition to the factor scores, overall perception of equal opportunity climate was measured by two global items:

148. Most people would rate the equal opportunity climate at this duty location as: Very Poor, Poor, About Average, Good, Very Good.

149. I, personally, would rate the equal opportunity climate at this duty location as: Very Poor, Poor, About Average, Good, Very Good.

Presently, MEOCS is undergoing refinement as a tool for assessing equal opportunity climate within a military setting. Although, by this time, a revised scale has been used in several field tests, certain questions relating to its psychometric properties have not been researched. Specifically, these questions include the following:

1. What is the relationship between the five scales on the MEOCS? What is the unique contribution of each scale to perceived overall equal opportunity climate? Do scales overlap in their measurement? Are certain scales more useful in predicting perceived overall equal opportunity climate than others?
2. What is the relationship between each of the items on the original version of the MEOCS--and perceived equal opportunity climate? What items are the best predictors of total score and of score on the global items? What items can be eliminated without lowering the reliability and validity of the total instrument?

The first study reported here looked at the independence of the MEOCS scales and their relationship to perceived overall equal opportunity climate as reported by the two global items. The second study is an item analysis, based in classical test theory (Kline, 1986), that identifies MEOCS items most predictive of perceived overall equal opportunity climate.

#### STUDY 1. Independence of MEOCS Scales.

Using the 1656 cases from the field test, scores were calculated for each participant on the following scales: Reverse Discrimination, Racist/Sexist Behaviors, Differential Command Behaviors, Sexual Harassment, and Positive Social Behaviors. Of the 1656 available cases, 1499 were available for analysis.

Means and standard deviations for scores on the five scales are presented in Table 1.

---

Table 1  
Means and Standard Deviations of MEOCS Factor Scores

	<u>No. Items</u>	<u>Mean</u>	<u>SD</u>
Reverse Discrimination	5	12.674	3.741
Racist/Sexist Behaviors	6	5.579	5.148
Positive Social Behaviors	7	13.252	5.348
Differential Command Behaviors	11	43.853	9.331
Sexual Harrassment	19	64.682	16.472

---

As shown in Table 1, scores on the factor scales differed widely, ranging from 5.579 to 64.682 because of the different numbers of items on each scale. Reverse Discrimination, for example, had only five items, whereas Sexual Harassment contained 19. Further, each item could be endorsed for a value of one to five points, depending upon the frequency with which a described behavior occurred.

Means and standard deviations on the global measures of equal opportunity are presented in Table 2.

-----

Table 2  
Means and Standard Deviations of Global  
Measures of Equal Opportunity Climate

	<u>Mean</u>	<u>SD</u>
Personal Perception of EO Climate	3.336	1.098
Perceptions of Others	3.310	1.058

-----

Since Personal Perception and Others' Perceptions are individual items, the maximum score on each was five. In terms of both personal opinion and opinion about group perceptions, Table 2 suggests that respondents described the equal opportunity climate as being about average.

In order for individual factor scores to be useful, they must measure different qualities. High correlations between scores on scales suggest that the same variable is being measured. Results of a correlational analysis of the relationship of the five scale scores are presented in Table 3.

-----  
 Table 3

Correlation Between Scale Scores, Personal Perceptions,  
 and Others' Perceptions of EO Climate\*

	Reverse	Racist	Social	Command	Harass	Personal	Others
Reverse	1.00	.33	-.25	.43	.44	.26	.26
Racist	.33	1.00	.01	.40	.51	.27	.28
Pos Social	-.25	.01	1.00	-.29	-.05	-.32	-.32
Command	.43	.40	-.29	1.00	.69	.44	.42
Harass	.44	.51	-.05	.69	1.00	.38	.33
Personal	.26	.27	-.32	.44	.38	1.00	.85
Others	.26	.28	-.32	.42	.33	.85	1.00

\* For N = 1499,  $r_{.05} = .0507$

-----

Given such a large number of subjects, virtually all relationships between variables will be significant. Several of the correlations between MEOCS scales, however, are so strong that it is almost certain that the scales are measuring the same dimensions. In particular, Differential Command Behaviors (Command) and Sexual Harassment (Harass) ( $r=.69$ ) clearly tap some of the same behaviors. Along the same lines, Sexual Harassment (Harass) and Racist/Sexist Behaviors (Racist) also have a relatively high correlation ( $r=.51$ ). Not surprisingly, the Command and Racist scales also correlate strongly ( $r=.40$ ).

Only two scales are relatively unrelated. Positive Social Behaviors (Social) is unrelated to Racist/Sexist Behaviors

(Racist) ( $r=.008$ ), and Sexual Harassment (Harass) is only marginally related to Positive Social Behaviors ( $r=.05$ ;  $p<.05$ ). Table 4 presents the the intercorrelations of scale scores in rank order.

Table 4

Ranked Intercorrelations of Scales Scores

Rank	Scales	Correlation
1.	Sexual Harassment x Differential Command	.69
2.	Sexual Harassment x Racist/Sexist	.51
3.5	Sexual Harassment x Reverse Discrimination	.44
3.5	Personal Perception x Differential Command	.44
5.	Differential Command x Reverse Discrimination	.43
6.	Others' Perceptions x Differential Command	.42
7.	Differential Command x Racist/Sexist	.40
8.	Personal Perception x Sexual Harassment	.38
9.5	Racist/Sexist x Reverse Discrimination	.33
9.5	Others' Perceptions x Sexual Harassment	.33
11.5	Personal Perception x Positive Social	-.32
11.5	Others' Perceptions x Positive Social	-.32
13.	Differential Command x Positive Social	-.29
14.	Others' Perceptions x Racist/Sexist	.28
15.5	Personal Perception x Racist/Sexist	.26
15.5	Personal Perception x Reverse Discrimination	.26
17.5	Others' Perceptions x Reverse Discrimination	.25
17.5	Positive Social x Reverse Discrimination	-.25
19.	Sexual Harassment x Positive Social	-.05
20.	Positive Social x Racist/Sexist	.01

Because the global items about equal opportunity climate address the perceptions of the respondent versus his or her judgment of the perceptions of others, these scores were also strongly related, correlating at the .85 level. The magnitude of this correlation implies that most people feel that their personal perceptions of equal opportunity climate are shared by others.

In order to determine the contribution of each scale score to global perceptions about equal opportunity climate, two stepwise multiple regression analyses were run: scores on the five scales were regressed against scores on personal perception of equal opportunity climate and on others' perceptions of equal opportunity climate. Because of the significant overlap between dimensions measured by the different MEOCS scales, results from this regression should be considered carefully before drawing conclusions about the efficacy of the overall measure.

#### Regression 1. Factor Scores on Personal Perception

The scale score most related to Personal Perception of EO climate was Differential Command Behaviors. Differential command refers to treating people differentially based upon their race or gender. Typical items on this scale include:

10. A White officer frequently reprimanded a minority enlisted person but rarely reprimanded a White enlisted person.

59. A White officer went over the work of a minority subordinate in far greater detail than the work of a White subordinate.

Adjusted  $R^2$  for Differential Command score was .19283, which is to say that about 20% of the variability in personal perceptions of equal opportunity climate can be explained by scores on the Differential Command scale. Although significant ( $F=358.87$ ;  $p<.00001$ ), the scale alone explains a relatively small amount of the variance in EO climate scores.

Addition of Positive Social Behaviors scores increased adjusted  $R^2$  to .23271 ( $F=228.17$ ;  $p<.00001$ ), increasing predictability of EO climate scores by about 4%. Adding scores from the Sexual Harrassment scale raised  $R^2$  to .25408, increasing predictive power of the MEOCS by about 2%. Entering Racist/Sexist Behaviors scores into the regression equation yielded an  $R^2$  of .26085 ( $F=133.16$ ;  $p<.00001$ ), for an increase of predictive utility of about .6%.

Scores on Reverse Discrimination did not add to the explanation of the variance on Personal Perception, and the scale consequently was not added to the regression equation. Results from the regression analysis are summarized in Table 5.

Table 5

Regression of Scores from Differential Command, Positive Social Behaviors, Sexual Harassment, Racist/Sexist, and Reverse Discrimination Scales on Personal Perception of EO Climate Score

Scale	R <sup>2</sup>	Percentage Increase in Predictive Utility	Cumulative No. of Items
Dif Command	.19283	---	11
Pos Social	.23271	3.988	18
Sexual Har	.25408	2.137	37
Racist/Sexist	.26085	.677	42

Regression 2. Factor Scores on Others' Perceptions

The scale score most related to Others' Perceptions of EO climate was also Differential Command Behaviors. Adjusted R<sup>2</sup> for Differential Command score against Others' Perceptions score was .17398, which is to say that about 17% of the variability in personal perceptions of equal opportunity climate can be explained by scores on the Differential Command scale. This is slightly lower than the 20% variability explained by this scale in Personal Perception scores. Although significant (F=316.31; p<.00001), the scale alone explains a relatively small amount of the variance in EO climate scores. Addition of Positive Social Behaviors scores increased adjusted R<sup>2</sup> to .21676 (F=208.28; p<.00001), increasing predictability of EO climate scores also by about 4%.

Racist/Sexist Behaviors score was the third variable entered into the regression equation, with an  $R^2$  value of .2403 ( $F=158.88$ ,  $p<.00001$ ). Inclusion of this variable increased predictive power of the equation by about 2%.

Finally, adding scores from the Sexual Harrassment scale raised  $R^2$  to .24313, accounting for a negligible .2% of total variance in Others' Perceptions scores.

Scores on Reverse Discrimination again did not add to the explanation of the variance on Others' Perceptions, and the scale consequently was not added to the regression equation. Results from the second regression analysis are summarized in Table 6.

-----

Table 6

Regression of Scores from Differential Command, Positive Social Behaviors, Sexual Harassment, Racist/Sexist, and Reverse Discrimination Scales on Others' Perceptions of EO Climate Score

Scale	$R^2$	Percentage Increase in Predictive Utility	Cumulative No. of Items
Dif Command	.17389	---	11
Pos Social	.21676	4.287	18
Racist/Sexist	.24023	2.347	24
Sexual Har	.24313	.290	53

-----

Study 1 Summary and Conclusions. In essence, evaluation of the MEOCS factor scales resembles a classic problem in job satisfaction research (cf. Smither, 1988). Measurement researchers have generally concluded that scores on facets considered relevant to job satisfaction--such as salary, advancement opportunities, supervision, etc.--do not predict job satisfaction better than a simple global measure of satisfaction. Most research, in fact, suggests that global and facet approaches to job satisfaction are equally valid. In that equal opportunity climate appears to be a psychological dimension related to satisfaction, it is reasonable to conclude that the two approaches to measurement are equivalent here as well.

In this analysis, the two global measures of equal opportunity climate provided a dependent variable against which scores on scales constructed around factors affecting EO climate might be regressed. Unfortunately, the interdependence of scales (see Table 2) obscures the interpretation of the regression. Although the contents of the five factor scales were derived from factor analysis, the regression suggests that further refinement of their contents is necessary before conclusions about the components of equal opportunity climate can be reached. One approach to refining scale content is through item analysis.

Item analysis (Kline, 1988; Rust and Golombok, 1989) is designed to determine which items best discriminate between high and low scorers on a particular measure. Persons involved in scale development use item analysis in order to gauge the effectiveness of their scales by eliminating items that do not predict well to total score. A general procedure is to generate

items, analyze the contribution of each item to total score on the measure, delete the less powerful items, then factor analyze the results to determine the underlying structure. (This procedure assumes, of course, that the validity of the scale has already been established.)

In Study 2, all 88 items of the MEOCS were analyzed to determine their contribution to equal opportunity climate score.

Study 2. Item Analysis of the Military Equal Opportunity Climate Survey. Item analysis, a procedure based on classical test theory, attempts to identify which items on a measure are most predictive of overall score. Given the overlap between scales of the MEOCS, item analysis would seem to be particularly useful in identifying a smaller number of items that would predict an individual's total score on the measure.

Item analysis of the responses of 1656 persons to the 88 items on the original MEOCS identified 3 items that correlated with total score at above the .90 level, 26 items that correlated above the .80 level, and 19 items that correlated above the .70 level. These item  $\times$  total score correlations are presented in Table 7.

Table 7

Items with Highest Correlation With Total Score on MEOCS

<u>R</u>	<u>Scale</u>	<u>Item</u>
.910	SH	81. An officer referred to women subordinates by their first names in public while using ranks for the male subordinates.
.904	SH	83. The commanding officer assigned an attractive female to show visiting male officials around because, "We need someone nice looking to show them around."
.901	SH	78. When the senior officer responsible for equal opportunity visited, the commanding officer selected a minority person, who was not the equal opportunity advisor, to be the escort.
.899	SH	82. A trained female mechanic was assigned to administration; a male trained in administration was assigned to mechanics.
.899	SH	84. A military woman who complained of sexual harassment was transferred to another unit.
.897	SH	71. A male in the unit left <u>Penthouse</u> or a similar magazine on his desk where a female coworker could see it.
.896	SH	79. The commanding officer told a female officer that he would prefer not to send her on temporary duty because she has children at home, but did not use the same consideration for men.
.890	SH	74. A lecture on sexual harassment focused only how women should act and dress to avoid sexual harassment.
.889	SH	76. A Black serviceman's coworkers no longer included him in their social events after he told them he is dating a White woman.

Table 7 (cont.)

## Items with Highest Correlation With Total Score on MEOCS

<u>R</u>	<u>Scale</u>	<u>Item</u>
.880	PS* 77.	A non-Hispanic person felt comfortable when overhearing friends speaking Spanish among themselves and then switching to English as he/she approached.
.878	SH 80.	A better qualified male officer was not picked for a good temporary duty assignment because the commanding officer said it would look better for equal opportunity to have a female officer on temporary duty.
.874	SH 73.	A female was asked to take notes and provide refreshments at staff meetings (such duties were not part of her job assignment).
.873	SH 63.	When a female officer was promoted, a male officer made the comment, "I wonder who she slept with to get promoted so fast."
.869	RS* 70.	Racial/ethnic jokes were not heard.
.866	SH 72.	A minority officer referred to a White officer as a "honkey."
.861	RS 67.	Offensive racial/ethnic names were not heard.
.860	PS* 64.	A commanding officer gave the same punishment to minority and White enlisted persons for the same offense.
.860	SH 66.	When a female complained of sexual harassment to her superior, he told her, "You're being too sensitive."
.851	SH 57.	A Jewish enlisted person was not given leave for a Jewish holiday but rather for a Christian one occurring at about the same time.
.847	SH 85.	A majority officer was overheard saying, "A minority person was promoted instead of a better qualified White."
.847	PS* 61.	White personnel joined minority friends at the same table in the mess hall/dining facility.

Table 7 (cont.)

## Items with Highest Correlation With Total Score on MEOCS

<u>R</u>	<u>Scale</u>	<u>Item</u>
.840	SH 69.	The only female in a work group was expected to provide house-keeping supplies, such as needle and thread, aspirin, etc., in her desk.
.836	SH 54.	A female in the unit was not assigned to late or hazardous duty because she would not be "safe" alone.
.821	PS* 49.	Field grade (above O-3) female officers had both males and females as subordinates.
.813	DF 56.	A reenlistment speech to a minority enlisted person focused on the lack of opportunity elsewhere; to a White enlisted, it focused on promotion.
.809	SH 55.	Women were not allowed to wear uniform slacks at mandatory formations.
.807	SH 48.	A commanding officer was asked to give a speech to new personnel in support of equal opportunity/affirmative action (EO/AA) goals, but sent a subordinate instead.
.802	SH 86.	A male enlisted person stated, "Our unit worked together better before the woman was assigned to us."
.801	DF 75.	A commanding officer gave a minority subordinate a more severe non-judicial punishment for a "minor" infraction. A White who committed the same offense was given a less severe penalty.

\* = reverse scored

SH = Sexual Harassment

DF = Differential Command Behaviors

PS = Positive Social Behaviors

RS = Racist/Sexist Behaviors

Of the 29 items correlating above .80, 21 of these loaded on the Sexual Harassment factor identified in the original factor analysis of the responses (Landis, 1990). Four items loaded on Positive Social Behaviors, two items loaded on Differential Command Behaviors, and two other items loaded on Racist/Sexist Behaviors. Not surprisingly, no items from the Reverse Discrimination scale correlated strongly with overall test score. As evidenced by the preceding multiple regression analysis, the five items on the Reverse Discrimination Scale appear to be only tangentially related to feelings about equal opportunity climate. This finding was further confirmed by a second multiple regression analysis in which Reverse Discrimination score was the first variable entered into the equation. When entered first, Reverse accounted for only 6.59% of the variance in scores on Personal Perception, and for only 6.33% of the variance in scores on Others' Perceptions.

In the final part of the analysis, the 29 items with the highest correlational values were then summed so that each individual had another global EO score in addition to his or her scores on Personal and Others' Perceptions. This third indicator of perceptions of EO climate was labelled EO Score. Mean EO Score for this group was 65.12 with a standard deviation of 19.68.

Results of the correlation between EO Score and Personal and Others' Perceptions are presented in Table 8.

---

Table 8

Correlation Between Three Global Measures  
Of Equal Opportunity Climate

	Personal Perceptions	Others' Perceptions
EO Score (29 items)	.410*	.441*

\*p < .001

---

In a further analysis of the relationship between items and perceptions of EO climate, the additional 19 items that correlated above .70 with full scale score were added to EO Score and correlated with Personal and Others' Perceptions of climate. Mean and standard deviation for scores on this expanded scale were 107.61 and 30.74 respectively. Results from the correlational analysis are presented in Table 9.

---

Table 9

Correlations Between Three Global Measures  
Of Equal Opportunity Climate

	Personal Perceptions	Others' Perceptions
EO Score (48 items)	.463*	.430*

\*p < .001

---

In terms of accounting for more variance, addition of the 19 items correlating above .70 with full scale score raised the correlation between EO Score and Personal Perceptions .022, and between EO Score and Others' Perceptions .020. Despite the fact that inclusion of these items lengthens the measure by 34%--from 29 to 48 items--their contribution to explaining variance in scores is negligible.

Study 2 Summary and Conclusions. Given the results of both the regression analysis in Study 1 and the item analysis in Study 2, it is apparent that the MEOCS can measure equal opportunity climate more efficiently if certain items are deleted from the scale. Use of the 29 items correlating with total score at levels above .80 gave virtually the same results as use of the 48 items correlating above .70.

It is interesting to note that 21 of these more powerful items appear on the Sexual Harassment Scale, which, in its entirety, was 40 items, constituting 45% of the MEOCS. Not all of the items identified by the item analysis were retained on the revised version of the MEOCS, however. Discrepancies between results of the factor analysis and the item analysis--as well as areas of agreement--are presented in Table 10.

-----

Table 10  
Items Identified as Having  
The Greatest Predictive Utility

<u>Items Identified By Factor Analysis</u>	<u>Items Identified By Item Analysis</u>	<u>Items Common To Both Analyses</u>	
39	48	63	
44	54	66	
45	55	69	
50	57	71	
51	72	73	
58	74	79	83
	76	80	84
	78	81	85
		82	86

-----

Of the predictive items identified by factor analysis, scores on four--Nos. 39, 45, 50, and 58--correlated with total MEOCS score at a level above .70. Score on Item 51 correlated at .691, and only Item 44--"A female supervisor was often mistaken by males for a clerk."--correlated at a relatively lower .575.

In Study 1, Differential Command Behaviors was found to be the scale most predictive of global measures of perceptions of equal opportunity climate. In Study 2, Sexual Harassment scores, along with 8 additional items from other scales, were found to be most predictive of total MEOCS score. This difference in predictive power between these two scales relates, of course, to

the criterion measure used to evaluate them--the global measure or total MEOCS score.

One area of possible research in the future is a factor analysis of responses to the 29 items identified as being most predictive of total MEOCS score. This second factor analysis may provide information about an alternative factor structure that will both shorten the time necessary to complete the MEOCS and strengthen its predictive utility.

## REFERENCES

- Borus, J. F., Fiman, B. G., Stanton, M. D., & Doud, A. F. (undated). The Racial Perceptions Inventory. Washington, D.C.: U.S. Army Institute for the Behavioral and Social Sciences.
- Fisher, G. (1988). Equal opportunity climate: Development and initial validation of an assessment instrument. Unpublished doctoral dissertation, University of Mississippi, University, MS.
- Hiett, R. L., McBride, R. S., Fiman, B. G., Thomas, J. A., O'Mara, F. E., & Sevilla, E. (1978). The Racial Attitudes and Perceptions Survey. (Technical Paper 338). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
- Kline, P. (1986). A handbook of test construction. New York: Methuen, Inc.
- Landis, D. (1990). Military Equal Opportunity Climate Survey: Reliability, construct validity, and preliminary field test. Patrick Air Force Base, FL: Defense Equal Opportunity Management Institute.
- Landis, D. & Fisher, G. (1987). Construction and preliminary validation of an instrument to measure equal opportunity climate. Contract No. F49620-85-C-0013.

- Landis, D., Fisher, G. Z., & Dansby, M. R. (1988a). Equal opportunity climate development and measurement of a concept. In Charles M. Solley, Jr., Festschrift. Paper presented at the Department of Psychology, Wayne State University, Detroit, Michigan.
- Landis, D., Fisher, G. Z., & Dansby, M. R. (1988b). Construction and preliminary validation of an equal opportunity climate assessment instrument. In Proceedings of Psychology in the DoD Symposium (Technical Report No. 88-1). Colorado Springs, CO: U.S. Air Force Academy.
- Nordlie, P. G. & Thomas, J. A. (1974). Measuring changes in institutional racial discrimination in the Army. McLean, VA: Human Sciences Press.
- Rust, J. and Golombok, S. (1989). Modern psychometrics. London: Routledge.
- Smither, R. D. (1988). The psychology of work and human performance. New York: Harper & Row.
- Stoloff, P. H. (1972). Use of Navy Human Relations Questionnaire with U.S. Army personnel. CNA Memorandum 1879-2. Institute of Naval Studies: Center for Naval Analyses.