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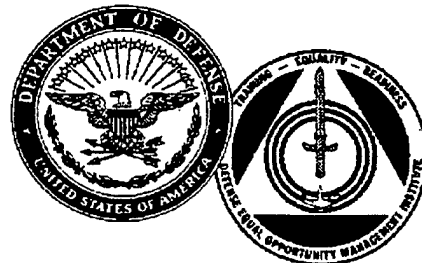
## DIVERSITY, ORGANIZATIONAL FACTORS, GROUP EFFECTIVENESS, AND TOTAL QUALITY: AN ANALYSIS OF RELATIONSHIPS IN THE MEOCS-EEO TEST VERSION 3.1

by

Stephen B. Knouse, PhD  
Alvin and Patricia Smith Professor of Management  
University of Southwestern Louisiana

Summer Faculty Research Fellow  
Summer 1996

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Abstract

This study examined the relationships among group member diversity, organization, group, and total quality (TQ) factors in the Military Equal Opportunity Climate Survey - Equal Employment Opportunity (MEOCS-EEO) Test Version 3.1 database (n=11,968). Results showed TQ correlated most strongly with work group effectiveness, leader cohesion, job satisfaction, group cohesion, organizational trust, and overall equal opportunity climate, respectively. Diversity, as measured by the reported percentages of women, minorities, disabled, and persons over age 40 in the work group, showed small but significant effects on TQ. A model of the relationships of diversity, group and organizational factors, and TQ is presented, followed by recommendations for diversity and TQ research and practice in the military.

Stephen B. Knouse, Ph.D.  
Alvin and Patricia Smith Professor of Management  
University of Southwestern Louisiana  
Lafayette, LA  
Summer Faculty Research Fellow

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The opinions expressed in this report are those of the author and should not be construed to represent the official position of DEOMI, the military services, or the Department of Defense.

## Introduction

Total Quality (TQ) variously termed Total Quality Management (TQM), Quality Management (QM), Continuous Quality Improvement (CQI), and Quality Improvement Process (QIP) is an important consideration in both civilian and military organizations today.

### Definition of TQ

TQ has been defined a number of ways depending upon the TQM leader (Crosby, 1979; Deming, 1986; Juran, 1988) and the organization (e.g., the Navy terms their program Total Quality Leadership [TQL] because it believes that leadership is a more activist, forward looking concept than management). Here we broadly define TQ borrowing from several sources (Blackburn & Rosen, 1993; Bowen & Lawler, 1992; Sashkin & Kiser, 1991):

Total Quality is an organizational philosophy of product and service quality based upon an orientation to the customer, continuous quality improvement, and a team empowerment approach to the quality effort.

### Team Effort in TQ

The last part of the definition--a team empowerment approach--implies that groups are empowered (have the skills, resources, and authority) to solve quality problems directly in order to improve quality. The traditional TQ approaches (Crosby, Juran, and Deming) concentrate on crossfunctional teams for solving quality problems, where members are drawn from different departments (and even customer groups) that are involved with the quality problem at hand (Evans & Lindsay, 1996).

Advantages of Diversity in Team Membership. In a broader sense the crossfunctional concept can be applied to the diverse makeup of the team. Indeed, some believe that diversity is the essence of group empowerment (Griggs & Louw, 1995b). Not only differences in departments but differences in diversity of backgrounds can provide a number of advantages to teams (Knouse, 1994; Knouse & Chretien, 1996):

1. Diverse perspectives on customer service

One of the defining characteristics of TQM is orientation to customer service. Because many organizations serve a diverse customer base (both customers internal to the organization and external customers), a diverse team membership can better understand the needs and expectations of these varied target customers (Cox, 1993).

## 2. Diverse approaches to continuous quality improvement

There is a growing amount of literature that shows diverse group membership can provide unique inputs into how the group operates: different approaches to defining the problem at hand, different approaches to solving the problem, greater critical analysis of solution alternatives, and more diverse and creative solutions to the problem (Cox, 1993; Cox & Blake, 1991; Watson, Kumar, & Michaelson, 1993). Moreover, diverse group membership can contribute a mix of skills and experiences for effective use of the tools of TQ (cause and effect diagrams, flow charts, Pareto charts, and statistical process control; Evans & Lindsay, 1996; Walton, 1986).

## 3. Synergistic effects in the group

Well-functioning diverse groups appear to know how to emphasize the strengths of their group members in order to enhance the diverse ideas and approaches of the membership (Griggs & Louw, 1995b). They are able to focus on commonalities, such as common goals, for drawing themselves together, and at the same time can focus on individual differences (skills and experiences) that are crucial for solving the problem at hand (Gardenswartz & Rowe, 1993; Gordon, 1995; Triandis, 1995; Triandis, Kurwoski, & Gelfand, 1994). Moreover, well-functioning diverse groups can channel their activities toward inclusion of all members in understanding and solving the problem at hand (Larkey, 1996).

Disadvantages of Diversity in Groups. Diverse groups are not without their problems, however.

### 1. Less cohesiveness

Evidence shows that heterogeneous groups (where members have different backgrounds) take longer to build group cohesiveness than do homogenous groups (where members have the same background; Triandis, 1995; Triandis, Kurowski, & Gelfand, 1994). Theoretically, this lack of cohesiveness may be explained several ways: less interpersonal attraction among members due to perceived dissimilarity, lack of social comparison (difficulty for individual members in defining themselves in terms of the group), and status incongruence (diverse members take on nontraditional roles in the group, such as women or minorities in leadership positions, producing ambiguous expectations in other members of the group) (Cox, 1993).

A major problem may be style of interaction. Negative perceptions of member differences may lead to misunderstanding or exclusion and detract from effective problem solving (Larkey, 1996).

## 2. Longer time frame for problem solving

Recent research shows that heterogeneous groups perform less well than do homogenous groups initially. Over time, however, heterogeneous groups eventually outperform homogenous groups in some measures of performance, such as identifying problem perspectives and generating alternative solutions (Watson et al., 1993).

## 3. Communication problems

Because groups with diverse members have varied frames of reference, there may be misunderstandings leading to tension and conflict (Cox, 1993). Moreover, expectations about how to communicate and interact may be unclear (Larkey, 1996).

## Diversity Management and TQ

In essence, diversity of team membership may facilitate group performance, such as TQ efforts, in some instances and hinder it in other situations. The diversity management literature can provide direction about what organizational factors may be involved in this relationship of diversity and TQ.

Recent reviews of the diversity management literature propose models that can serve as a basis for examining the effects of diversity on the effectiveness of organizational groups (Cox, 1993; Milliken & Martins, 1996). These models propose that diversity in background (race/ethnicity, gender, disability, and age), diversity in values (personality, cultural and socioeconomic values), and diversity in skills (education and experience) produce short-term affective consequences (satisfaction, commitment, cohesiveness, perceived discrimination, and supervisor relations) and short-term cognitive consequences (innovation, range of perspectives, and range of ideas). These short-term consequences in turn lead to long-term consequences, such as group performance (here TQ efforts).

The TQ literature lends support to these organizational relationships. TQ advocates suggest that several factors are important for TQ to succeed: crossfunctional teams (heterogeneity of membership), pride in work (satisfaction), commitment to organizational values of quality and meeting customer needs, smoothly functioning work groups (cohesiveness), absence of fear in interpersonal relations (absence of discriminatory behaviors among other things), and leadership (Bowen & Lawler, 1992; Deming, 1986; Evans & Lindsay, 1996).

## The Present Study

The present study examined the influence of diversity on the organizational affect factors similar to those identified above (satisfaction, commitment, cohesiveness; equal employment opportunity [EEO] climate, and leader cohesion) and perceptions of group performance (work group effectiveness and TQ). The instrument was an experimental version of the Military Equal Opportunity Climate Survey (MEOCS), which included EEO and other new scales, administered to a number of DoD organizations.

A previous preliminary study showed that a single quality question (Effectiveness Item 64) on the regular MEOCS correlated significantly with these factors for three military units with recognized quality programs: satisfaction ( $r=0.46$ ), commitment ( $r=0.25$ ), EEO climate ( $r=0.16$ ), and work group effectiveness ( $r=0.83$ ) (Knouse, 1994). The present study examined the relationships of a TQ scale in the experimental MEOCS to these factors in military and civilian DoD organizations.

## **Methods**

### Data Base

At the time of the analysis, there were 11,968 cases in the MEOCS-EEO Test Version 3.1 data base. In terms of military services, respondents were 35% Air Force, 44% Army, and the remainder in the other services. Active duty military organizations comprised 51% of the sample, DoD civilian organizations 35%, guard and reserve organizations 4%, and other organizations 10%. Military personnel comprised 48% of the respondents: 10% officers, 35% enlisted, and 3% warrant officer. Of the 47% who were civilian personnel, 34% were GS, 3% GM, and 10% WG and WS (5% of the sample were unknown).

In terms of respondent background characteristics, a majority were male (60%). The sample was racially and ethnically mixed with 18% African-American, 8% Hispanic, 59% white, 3% Native American, 4% Asian-American, and 8% other/unknown. Respondents were fairly well educated with 16% possessing a high school diploma or less, 42% some college, 20% a college degree, and 20% graduate work. Respondents were fairly young with 15% age 25 or younger, 15% age 26 to 30, 30% age 31 to 40, 23% age 41 to 50, and 14% over age 50.

### MEOCS-EEO Test Version 3.1

The MEOCS-EEO Test Version 3.1 was developed in 1994 to survey DoD organizations and has been administered in the field from 1994 through the present. This version consists of 132 items divided into seven parts: critical incident discriminatory behaviors, feelings about the organization, effectiveness of work group, satisfaction, individual beliefs about discrimination issues, perceptions of discriminatory climates, and demographics. From these items a number of scales were developed. In the present study the following were used:

Scale 6 Organizational Commitment: Six organizational items tapping values, pride, loyalty, longevity, policies, and the best interests of the individual.

Scale 7 Work Group Effectiveness: Five work group effectiveness items measuring quantity and quality of work group output, priorities, resources, and performance.

Scale 8 Job Satisfaction: Six satisfaction items tapping helping people, effort, family recognition and pride, job security, acquiring valuable skills, and job as a whole.

Scale 9 Work Group Cohesion: Four work group effectiveness items tapping team work, pulling together, member caring, and member trust.

Scale 10 Leader Cohesion: Four work group effectiveness items measuring leader teamwork, leader pulling together, leader caring, and leader trust.

Scale 11 Trust in the Organization: Four climate items representing organizational values, organizational loyalty to members, organizational pride in its members, and concern about the bottom line versus its members.

Scale 12 Overall EO Climate: Two demographic section items rating EO climate of the organization as perceived by most people and by the individual.

Scale 16 Total Quality Programs: Three work group effectiveness items tapping work group orientation toward satisfying internal and external customer needs, work group empowerment to make decisions to improve quality, and work group striving toward continuous quality improvement.

In addition, four demographic items asked the percentage of various types of membership (women, minority, disabled, and over age 40) in the respondent's work group ("people with whom you interact routinely on your job"). Each item had a six point scale categorizing percentages as 0-10%, 11-30%, 31-50%, 51-70%, 71-90%, and 91-100%. The present study treated these four items as indicators of work group diversity.

## **Results**

### Intercorrelations

Table 1 shows the intercorrelations of the diversity measures, the scales for organizational affect perceptions (organizational commitment, job satisfaction, group cohesion, leader cohesion, organizational trust, and overall EO climate), and effectiveness scales (work group effectiveness and TQ programs). The highest correlation was between work group effectiveness and TQ. Moderately strong correlations occurred among the organizational affect perceptions and between the affect perceptions and the effectiveness measures. Small negative but significant correlations occurred between the work group diversity measures and the other variables.

Table 1  
Intercorrelations of Organizational, Group, TQ, and Diversity Variables

Variable	Scale6	Scale7	Scale8	Scale9	Scale10	Scale11	Scale12	Scale16	Dem129	Dem130	Dem131
Org Commitment (Scale6)											
Group Effective (Scale7)	0.38										
Job Satisfaction (Scale8)	0.56	0.47									
Group Cohesion (Scale9)	0.43	0.67	0.49								
Leader Cohesion (Scale10)	0.57	0.41	0.52	0.53							
Org Trust (Scale11)	0.68	0.33	0.52	0.42	0.64						
EEO Climate (Scale12)	0.50	0.28	0.35	0.37	0.43	0.51					
TQ Programs (Scale16)	0.46	0.73	0.55	0.65	0.53	0.45	0.31				
% Women in Group (Dem129)	-0.01ns	-0.03	-0.01ns	-0.07	-0.05	-0.05	-0.06	-0.02ns			
% Minority in Group (Dem130)	-0.07	-0.10	-0.04	-0.10	-0.06	-0.08	-0.03	-0.08	0.36		
% Disabled in Group (Dem131)	-0.03	-0.16	-0.12	-0.11	-0.06	-0.04	-0.05	-0.13	0.09	0.17	
% Over 40 in Group (Dem132)	0.05	0.02ns	-0.02ns	0.00ns	-0.04	-0.01ns	-0.04	-0.02ns	0.28	0.04	0.17

All correlations significant at  $p < .001$  unless indicated as nonsignificant (ns).  $n = 8574$ .

## Analyses of Variance

Four-way analyses of variance examined more directly the effects of the diversity measures on the other variables. Because of the small numbers in the higher percentage categories of the diversity measures the six-point scales were collapsed down to three-point scales for each diversity measure: 0-10%, 11-30%, and over 30%. Multivariate analysis of variance showed all four diversity measures to be significant,  $F_{(16, 19540)} = 4.82, 12.22, 20.89, \text{ and } 8.24$ , for women, minority, disability, and age, respectively. Table 2 shows the univariate main effects for each type of diversity for the organizational and effectiveness variables. In general, the highest rated perceptions occurred for 11-30% diversity with a decline with higher levels of diversity. For the disabled category, however, as disabled percentage increased in the group, perceptions of organizational affect and effectiveness declined in a linear manner.

The interaction terms show how combinations of type of diversity affect organizational and effectiveness perceptions. Table 3 represents the significant two-way interactions (in general the three-way and four-way interactions were nonsignificant). Table 3 demonstrates that the combinations of women and minorities affected organizational variables (commitment, trust, and EO climate), cohesion variables (group and leader cohesion), and group effectiveness and TQ. Disabled in combination with other diversity types affected several variables. These trends may be slight due to small sample sizes in the larger percentage diversity categories.

## Regression

Finally, a stepwise regression analysis showed the variance of TQ accounted for by various organizational and diversity measures ( $R^2 = 0.63$ ). Table 4 shows that the most important factor in TQ was work group effectiveness. In addition, leader cohesion, job satisfaction, work group cohesion, trust in the organization, overall EO climate, and percentage of women in the work group contributed.

Because work group effectiveness and TQ were highly correlated, an additional analysis was performed where group effectiveness and TQ were combined to form a new variable termed Group TQ Effectiveness  $[(\text{Scale7} + \text{Scale16})/2]$ . A stepwise regression of organizational and diversity variables on this new variable accounted for variance ( $R^2 = 0.56$ ) similar to the regression on TQ. Table 5 shows that group cohesiveness was the most important contributor, followed by job satisfaction, and leader cohesion. All four diversity measures (percentages of women, minorities, disabled, and persons over 40) entered the equation. Organizational commitment and overall EO climate contributed to a lesser extent.

**Table 2**  
Main Effect Means for Organizational and  
Effectiveness Variables by Type of Diversity

Variable	Diversity Type#	Percentage of Type in Group			$F_{(2,10115)}$
		0-10%	11-30%	Over 30%	
Commitment	Women	3.16	3.28	3.25	10.04***
	Minority	3.20	3.32	3.19	23.74***
	Disabled	3.24	3.25	3.07	10.84***
	Over 40	3.14	3.23	3.27	18.26***
Satisfaction	Women	3.65	3.70	3.67	3.36*
	Minority	3.69	3.71	3.64	2.62
	Disabled	3.71	3.60	3.21	79.54***
	Over 40	3.69	3.70	3.65	1.01
Group Cohesion	Women	3.81	3.91	3.75	9.97***
	Minority	3.82	3.91	3.73	13.90***
	Disabled	3.84	3.77	3.30	58.64***
	Over 40	3.80	3.82	3.79	1.56
Leader Cohesion	Women	3.22	3.31	3.19	4.91**
	Minority	3.24	3.32	3.16	12.35***
	Disabled	3.25	3.15	2.95	11.34***
	Over 40	3.27	3.26	3.18	3.16*
Organization Trust	Women	3.06	3.21	3.07	15.66***
	Minority	3.09	3.19	3.04	16.95***
	Disabled	3.11	3.09	2.90	9.30****
	Over 40	3.09	3.13	3.09	1.05
Overall EO Climate	Women	3.35	3.49	3.35	9.01***
	Minority	3.17	3.52	3.36	60.59***
	Disabled	3.41	3.26	3.16	17.56***
	Over 40	3.42	3.44	3.33	4.30*
Work Group Effectiveness	Women	4.05	4.13	4.04	4.89**
	Minority	4.10	4.14	3.99	13.95***
	Disabled	4.10	4.03	3.41	140.93***
	Over 40	4.04	4.07	4.06	5.00**
TQ	Women	3.88	3.97	3.89	6.50**
	Minority	3.96	3.97	3.84	11.20***
	Disabled	3.95	3.86	3.25	155.58***
	Over 40	3.87	3.93	3.91	6.03**
#Sample sizes	Women	3075	2627	5919	*p < .05
	Minority	2050	3572	5980	**p < .01
	Disabled	9809	1009	788	***p < .001
	Over 40	2732	2811	5968	

**Table 3**  
Means for Significant Two-Way Interactions for  
Organizational and Effectiveness Variables by Type of Diversity

Variable	Percentage of Type in First Diversity Variable	Percentage of Type in Second Diversity Variable			$F_{(4, 10115)}$
		0-10%	11-30%	Over 30%	
<b><u>Commitment</u></b>					
Interaction:	Women x Minority				3.46**
	0-10%	3.20	3.22	3.06	
	11-30%	3.25	3.36	3.21	
	Over 30%	3.18	3.36	3.21	
Interaction:	Women x Disabled				2.45*
	0-10%	3.15	3.28	3.22	
	11-30%	3.30	3.23	3.04	
	Over 30%	3.26	3.25	3.04	
<b><u>Satisfaction</u></b>					
Interaction:	Women x Disabled				5.14***
	0-10%	3.66	3.60	3.47	
	11-30%	3.73	3.56	3.40	
	Over 30%	3.72	3.61	3.10	
Interaction:	Disabled x Age				3.92**
	0-10%	3.70	3.72	3.70	
	11-30%	3.27	3.59	3.64	
	Over 30%	3.45	3.35	3.16	
<b><u>Cohesion</u></b>					
Interaction:	Women x Minority				5.26***
	0-10%	3.88	3.81	3.74	
	11-30%	3.84	3.98	3.85	
	Over 30%	3.68	3.91	2.70	
Interaction:	Women x Disabled			3.18*	
	0-10%	3.82	3.74	3.62	
	11-30%	3.92	3.86	3.59	
	Over 30%	3.80	3.75	3.14	
Interaction:	Disabled x Age				4.28**
	0-10%	3.82	3.85	3.84	
	11-30%	3.30	3.70	3.83	
	Over 30%	3.55	3.32	3.27	

**Table 3 (Continued)**

<b><u>Leader Cohesion</u></b>					
Interaction:	Women x Minority				6.38***
	0-10%	3.32	3.19	3.13	
	11-30%	3.26	3.44	3.21	
	Over 30%	3.07	3.32	3.16	
<b><u>Organizational Trust</u></b>					
Interaction:	Women x Minority				3.68**
	0-10%	3.11	3.05	3.01	
	11-30%	3.16	3.32	3.12	
	Over 30%	3.02	3.20	3.03	
<b><u>EO Climate</u></b>					
Interaction:	Women x Minority				3.72**
	0-10%	3.24	3.46	3.34	
	11-30%	3.15	3.62	3.48	
	Over 30%	3.06	3.48	3.34	
Interaction:	Women x Disabled				3.34*
	0-10%	3.36	3.19	3.13	
	11-30%	3.53	3.30	2.86	
	Over 30%	3.37	3.27	3.24	
Interaction:	Disabled x Age				6.26***
	0-10%	3.45	3.47	3.35	
	11-30%	2.92	3.17	3.32	
	Over 30%	2.79	3.04	3.22	
<b><u>Work Group Effectiveness</u></b>					
Interaction:	Women x Minority				4.40**
	0-10%	4.12	4.05	3.97	
	1-30%	4.08	4.18	4.09	
	Over 30%	4.08	4.18	3.97	
Interaction:	Women x Disabled				6.04***
	0-10%	4.06	3.97	3.79	
	11-30%	4.15	4.04	3.74	
	Over 30%	4.11	4.04	3.22	
Interaction:	Minority x Disabled				2.52*
	0-10%	4.12	3.81	3.92	
	11-30%	4.17	4.01	3.66	
	Over 30%	4.05	4.05	3.31	
Interaction:	Disabled x Age				6.76***
	0-10%	4.06	4.10	4.13	
	11-30%	3.52	3.97	4.09	
	Over 30%	3.82	3.25	3.39	

**Table 3 (Continued)**

<b>Total Quality</b>					
Interaction:	Women x Minority				3.50***
	0-10%	3.98	3.87	3.78	
	11-30%	3.97	4.03	3.91	
	Over 30%	3.93	4.00	3.84	
Interaction:	Women x Disabled				6.60***
	0-10%	3.89	3.86	3.55	
	11-30%	4.00	3.84	3.59	
	Over 30%	3.97	3.87	3.10	
Interaction:	Disabled x Age				4.54**
	0-10%	3.90	3.96	3.98	
	11-30%	3.42	3.80	3.93	
	Over 30%	3.48	3.30	3.22	

\*p < .05

\*\*p < .01

\*\*\*p < .001

**Table 4**

<b>Regression of Organizational, Group, and Diversity Variables on TQ Programs (Scale16)</b>			
Variable	B	Beta	F (on entry)
Work Group Effectiveness (Scale7)	0.52	0.49	3392.34***
Leader Cohesion (Scale10)	0.11	0.13	216.67***
Job Satisfaction (Scale8)	0.15	0.14	276.98***
Group Cohesion (Scale9)	0.14	0.16	293.02***
Organization Trust (Scale11)	0.05	0.05	33.15***
Overall EO Climate (Scale12)	-0.03	-0.03	21.96***
Organizational Commitment (Scale6)	0.04	0.04	17.46***
%Women in Group (Dem129)	0.01	0.02	11.35***
(Constant)	0.13		14.36***

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<b>Table 5</b>			
Regression of Organizational, Group, and Diversity Variables on Group TQM Effectiveness <sup>a</sup>			
Variable	B	Beta	F (on entry)
Work Group Cohesion (Scale9)	0.44	0.53	4023.82***
Job Satisfaction (Scale8)	0.20	0.20	520.47***
Leader Cohesion (Scale10)	0.06	0.08	85.75***
%Disabled in Group (Dem131)	-0.09	-0.07	93.89***
Organization Commitment (Scale6)	0.07	0.07	52.59***
%Over 40 in Group (Dem132)	0.02	0.03	15.01***
Overall EO Climate (Scale12)	-0.02	-0.02	6.30*
%Women in Group (Dem129)	0.01	0.02	10.92**
%Minority in Group (Dem130)	-0.02	-0.02	8.48**
(Constant)	1.26		1155.05***
<sup>a</sup> Group TQ Effectiveness = [Group Effectiveness(Scale7) + TQ(Scale16)]/2			
*p < .05			
**p < .01			
***p < .001			

## Discussion

### Effects of Diversity

The diversity management literature suggests that increased diversity in work groups can be beneficial to group efforts in terms of enhanced perspectives and a greater variety of approaches that can be brought to bear on group work. At the same time, diversity can make cohesiveness harder to achieve, group work becomes more complex and takes longer to accomplish, and communication becomes more difficult. The present data show that a smaller amount of diversity appears to be somewhat effective, although as diversity increases beyond 30%, organizational perceptions and effectiveness decline. The optimal level appears to be 10-

30% diversity. Interestingly, this corresponds to what the diversity management writers term the "psychological minority phenomenon," where the established majority feels comfortable with about 20% minority in the group (Davis, 1980). Indeed, there appears to be a "critical mass" of 15 - 20% minority in which diverse groups suffer minimal disruption and conflict (Kanter, 1977). Other researchers, however, caution that additional factors besides diversity composition can come into play, such as cultural stereotypes, task competence of members, and status differences (Levine & Moreland, 1995).

The exception in the present study is the disabled category, which exhibits a declining linear trend as percentage of disabled in the group increases. It should be noted, however, that most disabled appeared in the 0-10% category (n=9809) with a much smaller number in the 11-30% category (n=1009) and a very small number over 30% (n=788). Therefore, this difference may be a function of greatly differing sample sizes.

### Model of Diversity Effects

Figure 1 presents a model of the effects of diversity upon organizational variables and TQ, based upon the relationships found in the present study. The model generally agrees with the directionality of models in the diversity management literature (Cox, 1993; Milliken & Martins, 1996). The diversity effects are small but significant. Although as diversity increases overall the effects detract from organizational and effectiveness variables, the ANOVA analyses revealed that a smaller amount of diversity can have enhancing effects.

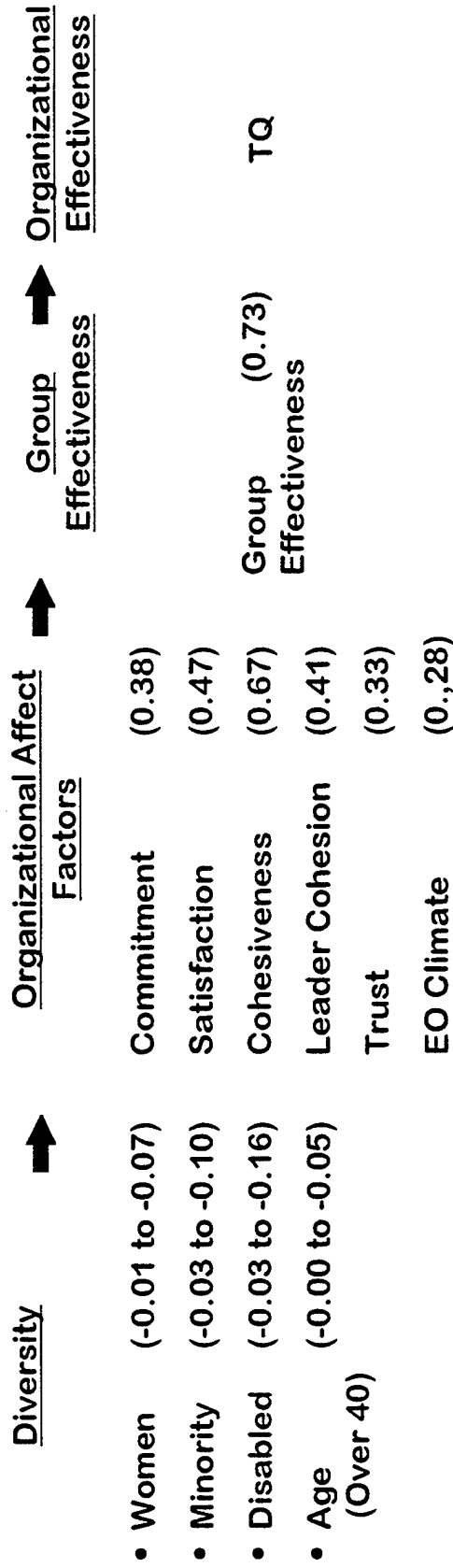
### Limitations

Diversity was measured here as percentage of women, minorities, disabled, and individuals over age 40 reported to be in the peer group. It is assumed that the peer group is probably at least an informal work group if not a formal work team. There is the possibility, however, that in some cases these were merely work relationships that did not function as a ongoing group. It should be pointed out, however, that TQ work teams may not be long term, but merely temporarily formed to solve a specific quality problem. In addition, TQ teams may incorporate distal work relationships, such as internal customers in other departments in the organization and external customers outside of the organization (Evans & Lindsay, 1996; Walton, 1986).

Moreover, the diversity types in the interaction effects may not be independent but may represent in some cases "double counting" (e.g., a woman and a minority may be the same individual). At least in terms of diversity management and TQ, this should not make a difference. The focus is upon unique background characteristics, not how many individuals are in the group. If an individual can bring to a quality problem multiple perspectives from several unique characteristics, that should theoretically improve the situation.

# Figure 1

## Diversity Effects on Organizational Factors, Group Effectiveness, and TQ



Furthermore, unlike a similar previous study where only units that had recognized quality programs were targeted (Knouse, 1994), the present study employed a broad range data base covering a wide variety of DoD organizations. Interestingly, the results of the present study were similar to the previous effort. This may reflect a DoD emphasis for the past several years on TQ programs, or it may reflect more specific quality efforts at the local level.

### Future Research

This study demonstrated small but significant effects for diversity. Future research should examine whether the disabled category, in particular, truly has a significant effect on organizational and effectiveness measures. If so, groups with disabled members might receive special attention, for example in awareness training and in building cohesiveness (Stone & Colella, 1996).

In addition, future research should examine means of combining types of diversity into an overall diversity measure. Both type and amount of diversity should be reflected in this overall measure. Future research should also examine other measures of diversity, such as experience and skill levels, which would reflect the diversity management concept that all individuals in the group have something important to contribute (Gardenswartz & Rowe, 1993; Milliken & Martins, 1996).

Future research should try to target work group teams more directly. Perhaps additional group items could be incorporated in experimental MEOCS versions tapping characteristics of the respondent's work group, such as group size, longevity (length of time group has existed with present members), and effectiveness of group interactions.

The present study found that the TQ Programs Scale of the MEOCS related to a number of organizational, group, and diversity measures. Further research into how TQ influences or is influenced by individual and organizational factors would appear to be fruitful. Moreover, the regression analysis of the new variable combining TQ and work group effectiveness showed some promising results in terms of relationships to organizational and diversity variables. It also fits nicely with the TQ literature orientation toward team quality efforts.

### Recommendations for Research and Practice

1. Continue to research the TQ Programs Scale.

It would be interesting to see how this scale relates to unit performance measures, such as turnover and evaluations of effectiveness independent of respondent perceptions.

2. Continue to research diversity measures.

The percentage of diversity types in groups is one measure. Others, such as skill and experience mix, would broaden the scope of diversity measurement.

3. Look closely at groups with disabled members.

The present data appear to show that groups with disabled members may have special problems in terms of satisfaction, cohesion, group effectiveness, and TQ. Further research should clarify that this is simply not a statistical artifact of sample size. If this effect actually occurs, special treatment in terms of team building may be necessary, such as awareness training about the unique problems and contributions of disabled members (Stone & Colella, 1995).

4. Consider diversity in group development.

If an optimal diversity level, for example 10-30%, shown in the present study is replicated in other research, team composition should take this into account. In other words, too much diversity may be possible, at least at first as the team forms, and may hinder initial team efforts (Griggs & Louw, 1995a).

Another implication is that increasing levels of diversity, which may be necessary for a variety of organizational reasons (e.g., a quality problem requires the input of diverse types of individuals), may require enhanced team development efforts. The diversity management literature suggests a number of efforts that may be effective (Ferdman & Brody, 1996; Gardenswartz & Rowe, 1993; Griggs & Louw, 1995a; Knouse & Chretien, 1996):

- **Identify and build on shared values in the group**

The TQ orientation fits nicely here for providing core values that diverse group members can share (orientation to the customer, emphasis on quality, and continuous improvement).

- **Demonstrate appreciation for each member's uniqueness**

The unique background of each member can provide richer perspectives for group activities, such as problem solving.

- **Be sensitive to member differences**

The group must first understand the differences among its members in order to build upon them. Sensitivity to differences can be enhanced by a number of methods, such as pairing different individuals (e.g., male and female, or African-American and European-American), who can help one another in accomplishing specific tasks.

- **Acknowledge that group members are functionally interdependent**

If the advantages of diversity membership are to work for a group, all members must be able to contribute to build upon their unique efforts. Exercises in interdependence can be helpful, such as the superordinate goals activity, where each member has a crucial piece of information that is required for the group to solve a problem.

- **Establish well defined roles and responsibilities**

Conflict and lack of cohesion can result from unclear expectations among group members. A major source can be poorly defined group roles and responsibilities for individual members, which can result in misunderstandings and "turf wars." Defining the group mission and direction early in group development can be beneficial.

- **Institute effective problem-solving rules for diverse groups**

The problem-solving process requires a clear understanding of terms used. Different members of the group may use and understand common terms differently, which may cause initial ambiguity and tension. Therefore, one of the first steps in problem solving should be the defining of important terms.

A common problem resolution technique is consensus, which supposedly builds upon group cohesion and commonality of values. The traditional type of consensus, where all members agree on the solution, may have to be modified, however, since strong agreement may be impossible to achieve. Therefore, in diverse groups consensus may have to be redefined as all members can "live with" the decision, rather than everyone embracing the decision. Moreover, calling a vote on alternative solutions can magnify differences of opinion and thus polarize members and should be avoided.

## **Conclusion**

The present study shows that TQ is related to a number of group affect, effectiveness, and diversity variables. Two major implications arise. First, quality will most likely continue to be a major issue in the American private and public sectors, including the DoD. Although the three major American quality leaders (Crosby, Deming, and Juran) have either retired or passed on, and although quality initiatives continue to change (continuous improvement should also be applied to the continuous improvement processes themselves), quality must continue to be the focus of American organizations, including the military, if they are to be successful on the international scene. Second, teamwork will become increasingly more important not only to quality efforts but also to other organizational processes in the future. Moreover, diversity in the broad sense of variety of team member backgrounds, values, abilities, and experiences will become an increasingly significant factor in group functioning. Therefore, quality management and diversity management will not only be important concerns in the future but may well be converging issues, requiring continuing attention by the American military.

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