

**Trust in Leadership DEOCS 4.1  
Construct Validity Summary**



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## Background

In 2014, DEOMI released DEOCS 4.0 for Department of Defense military and civilian members. DEOMI initiated development of DEOCS 4.1 in May 2016. This effort includes various updates to improve climate factors and individual items on the DEOCS. The following details the efforts directed toward updating the factor of Trust in Leadership. Included is a review of the 4.0 factor description and items, followed by the proposed modifications to the factor.

The current description provided for Trust in Leadership is “the perception that leaders will treat members fairly and support their success” (“Assessment to Solutions,” 2016). Three items are used to measure the current factor; these are presented below in Table 1.

The purpose of the current summary is to provide a review of the literature surrounding trust in leadership as it pertains to the DEOCS. This review also includes the rationale for modifying this factor in previous versions of the DEOCS, an exploration of construct definitions and validated measures, and finally a summary of the statistics and results used to determine the construct validity of the factor.

**Table 1.**  
*DEOCS 4.0 Trust in Leadership Items*

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DEOCS 4.0
1. I trust that my organization’s leadership will represent my best interests.
2. I trust that my organization’s leadership will treat me fairly.
3. I trust that my organization’s leadership will support my career advancement.

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## Literature Review

Trust in leadership is defined by Rousseau, Sitkin, Burt, and Camerer (1998) as “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another” (p. 395). In a meta-analytic review of trust in leadership, Dirks and Ferrin (2002) propose that an individual’s immediate supervisor—when compared with more senior level leaders—has increased daily interactions with followers and more opportunities to develop a reciprocal relationship of trust. Results of their meta-analysis suggest that, when compared to trust in senior level leadership, trust in the immediate supervisor had equal to or greater effect on organizational outcomes. These outcomes included increased performance, job satisfaction, and acts of altruism, and decreased intentions to quit.

There are two main perspectives that affect the development of trust between the follower and the leader (Dirks & Ferrin, 2002). One perspective states that trust is formed through a social exchange process, where a high quality relationship of care and consideration will result in higher levels of trust from both parties (Konovsky & Pugh, 1994). The second perspective suggests that a leader’s character and the dependability of his or her actions will influence the follower’s development of trust (Mayer, Davis, & Schoorman, 1995). A high level of trust is important to the follower, since his or her leader has the power to make decisions that can greatly impact the ability of the follower to achieve specific goals.

However, Yang and Mossholder (2010) suggest that both of these perspectives should be examined, and respectively refer to these bases as affective and cognitive trust. Affective trust refers to the reciprocation of care and consideration between the follower and leader (Dirk & Ferrin, 2002), while cognitive trust focuses on follower's perceptions of the ability, dependability, and integrity of the leader (Mayer et al., 1995).

In developing a more accurate and encompassing definition to describe this factor, team members reviewed the literature and agreed to adopt a different definition, where trust in leadership is "the expectation that a leader will act in your organization's best interest, that he or she will follow through with actions which affect the outcomes of others, and that he or she will act in a fair and equitable manner (Dirks, 2000; Hogan, Curphy, & Hogan, 1994; Whitener, Brodt, Korsgaard, & Werner, 1998)."

Items used to gauge the newly defined construct were adapted from Yang and Mossholder's (2010) affective and cognitive trust in supervisor measure. This measure was tested in an organizational setting, with affective trust significantly predicting an increase of in-role and extra-role behaviors (e.g. staying late to help a coworker), job satisfaction and affective organizational commitment, and cognitive trust significantly predicting increased job satisfaction.

The original three DEOCS 4.0 items referred to senior level leadership in asking about trust. However, based on recommendations provided in the literature concerning trust in leadership, the new items change the referent of trust to the individual's immediate supervisor.

## **Data Analysis**

### ***Sample Description***

This section contains the demographic characteristics of two samples used to test the new trust in leadership items on a four- ( $n = 5,730$ ) and seven- point scale ( $n = 5,251$ ). The variables are displayed according to the individual respondents' selections. The Service branch representation of the four-point scale sample includes: 45.4% Army ( $n = 2,497$ ), 27.6% Navy ( $n = 1,518$ ), 7.1% Marine Corps ( $n = 390$ ), 7.7% Air Force ( $n = 422$ ), <1% Coast Guard ( $n = 25$ ), and 11.6% National Guard ( $n = 638$ ). The Service branch representation of the seven-point scale sample includes: 39.8% Army ( $n = 2,038$ ), 28.5% Navy ( $n = 1,460$ ), 18.1% Marine Corps ( $n = 926$ ), 2.5% Air Force ( $n = 130$ ), >1% Coast Guard ( $n = 5$ ), and 10.9% National Guard ( $n = 559$ ). The majority of respondents in the respective samples are male (78 and 79%). Additional information regarding the composition of the sample is provided below in Table 2.

**Table 2.**  
**Sample Demographics of Trust in Leadership Items Piloted on DEOCS**

	Four-point Scale		Seven-point Scale	
	n	%	n	%
<b>Branch of Service</b>				
Army	2,497	45.4%	2,035	39.8%
Navy	1,518	27.6%	1,457	28.5%
Marine Corps	390	7.1%	925	18.1%
Air Force	422	7.7%	130	2.5%
Coast Guard	27	<1%	5	<1%
National Guard	638	11.6	559	10.9%
<b>Component</b>				
Active Duty	3,067	78.8%	3,409	87.6%
Reserve	827	21.2%	484	12.4%
<b>Gender</b>				
Male	4,499	78.5%	4,100	78.2%
Female	1,231	21.5%	1,143	21.8%
<b>Seniority</b>				
Junior Enlisted (E1 - E3)	856	18.9%	1,047	23.5%
Non-Commissioned Officer (E4-E6)	2,528	44%	2,363	53.0%
Senior Non-Commissioned Officer (E7 - E9)	496	8.6%	463	10.4%
Junior Officer (O1 - O3)	388	6.8%	362	8.1%
Senior Officer (O4 and above)	258	4.5%	225	5.0%

***Item Descriptive Statistics and Reliability***

This section displays descriptive statistics for the items on both the four- and seven-point scales. The four-point scale was run first to test the entire set of items; based on those results, certain items were eliminated before transitioning to the seven-point scale. The four- and seven-point scale both included *strongly disagree* to *strongly agree* anchors, with the seven-point scale including three extra anchors, *slightly disagree*, *neither agree nor disagree*, and *slightly agree*. All reliability analyses were conducted using Cronbach’s Alpha. The reliability coefficients for the four-point scale and seven-point scale were adequate and they had respective Alpha values of .97 and .92). Additional descriptive statistics and reliability estimates are respectively provided in Table 3 and Table 4.

**Table 3.*****Descriptive Statistics of Prospective Trust in Leadership Items Piloted on DEOCS***

<b>Item</b>	<b>Mean</b>	<b>SD</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Four-point Scale Items</b>				
I can depend on my immediate supervisor to meet his or her responsibilities.	3.12	.89	-.96	.26
I can rely on my immediate supervisor to act in my organization's best interest.	3.18	.86	-1.05	.66
My supervisor follows through with the commitments he or she makes.	3.12	.87	-.94	.39
Given my immediate supervisor's track record, I have no reason to doubt his or her competence.	3.14	.90	-.95	.21
My immediate supervisor cares about my personal needs at work.	3.11	.90	-.91	.17
I feel comfortable sharing my work difficulties with my immediate supervisor.	3.04	.94	-.80	-.21
My immediate supervisor treats me fairly.	3.19	.85	-1.05	.67
I can rely on my immediate supervisor to act in my organization's best interest.	3.09	.92	-.88	-.01
<b>Seven-point Scale Items</b>				
I can rely on my immediate supervisor to act in my organization's best interest.	5.48	1.72	-1.29	.77
My immediate supervisor follows through with the commitments he or she makes.	5.47	1.71	-1.27	.68
I feel comfortable sharing my work difficulties with my immediate supervisor.	5.27	1.85	-1.05	-.03
My immediate supervisor treats me fairly.	5.66	1.62	-1.46	1.38

*Note: The Std. Error for four-point scale Skewness is .03, seven-point scale Skewness is .034; four-point scale Kurtosis is .07, and seven-point scale Kurtosis is .068.*

**Table 4.*****Reliability Analysis of Prospective Trust in Leadership Items Piloted on DEOCS***

<b>Item</b>	<b>Corrected Item-Total Correlation</b>	<b>Cronbach's Alpha if Item Deleted</b>
<b>Four-point Scale Items</b>		
I can depend on my immediate supervisor to meet his or her responsibilities.	.86	.97
I can rely on my immediate supervisor to act in my organization's best interest.	.87	.97
My supervisor follows through with the commitments he or she makes.	.89	.97
Given my immediate supervisor's track record, I have no reason to doubt his or her competence.	.88	.97
My immediate supervisor cares about my personal needs at work.	.89	.97
I feel comfortable sharing my work difficulties with my immediate supervisor.	.86	.97
My immediate supervisor treats me fairly.	.89	.97
I can rely on my immediate supervisor to act in my best interest.	.91	.96
<b>Seven-point Scale Items</b>		
I can rely on my immediate supervisor to act in my organization's best interest.	.78	.92
My immediate supervisor follows through with the commitments he or she makes.	.87	.89

I feel comfortable sharing my work difficulties with my immediate supervisor	.81	.91
My immediate supervisor treats me fairly.	.84	.90

Note: Four-point scale  $\alpha = .97$ ; Seven-point scale  $\alpha = .92$

### ***Principal Components Analysis***

After examining the descriptive statistics and reliability analyses on all trust in leadership items, the seven-point scale was selected for additional exploratory analyses. This decision was based on a revision to all scale anchors during the transition of DEOCS 4.0 to 4.1, where the four-point scale was expanded to a seven-point scale.

Factor analysis was conducted on the final four Trust in Leadership items selected for the DEOCS 4.1. These items were chosen for further analyses based on the factor definition, individual item statistics, as well as the high reliability of the measure. The Bartlett Test of Sphericity (BTS; Snedecor and Cochran, 1983) and the Kaiser Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser and Rice, 1974) were used to assess the fit between the data and the factor. The BTS hypothesizes that the correlation matrix is an identity matrix. The obtained value of this test statistic for sphericity was large, and the associated significance level was small (BTS = 18,287.06;  $p < .001$ ). This allows us to reject the null hypothesis that the correlation matrix is an identity, and to conclude that the factor analysis is an appropriate method to analyze these data (Norusis, 1993). The KMO measure was also employed to compare the sum of the squared correlation coefficients and the squared partial correlation coefficients. The obtained statistic was .85, indicating a very good fit, again suggesting that a factor analysis is an appropriate statistical method to analyze these data.

The principal components analysis yielded a one factor solution, which suggests that the theoretical definition of Trust in Leadership as a single construct is correct. Refer to Table 5 for more information.

**Table 5.**  
***Principal Component Analysis Pattern Matrix of Trust in Leadership Items***

<b>Items</b>	<b>Component 1</b>
I can rely on my immediate supervisor to act in my organization's best interest.	.88
My immediate supervisor follows through with the commitments he or she makes.	.93
I feel comfortable sharing my work difficulties with my immediate supervisor.	.90
My immediate supervisor treats me fairly.	.92

Note. All items loaded on to one factor.

### ***Aggregation Statistics of Final Trust in Leadership Items***

Surveys, including climate surveys, often measure a construct by obtaining multiple ratings from individuals and aggregating those data to the group level. The construct of interest is then amenable to interpretation at the group level; this allows for shifting the interpretation from one that compares individuals' differences on a specific construct to one that compares organizations' differences on that construct. The interpretation of the same construct often differs between individual- and group-level. Some researchers believe the assessment of agreement is a prerequisite for arguing that a higher-level construct can be operationalized from individual-level

data; other researchers maintain that the variance of within- group agreement is of theoretical importance, and should be studied (see Burke, Borucki & Kaufman, 2002).

The DEOCS typically remains open for 21 to 30 days. The data analyzed here were obtained from individuals who completed the research blocks of the DEOCS between 30 July 2016 and 4 August 2016; therefore, caution should be taken when interpreting the aggregation statistics, because the sample can reflect subsets of the entire complement of unit/organization members that ultimately completed the survey. Additionally, respondents are aggregated at the unit-level using a grouping variable that can identify the individuals who belongs to each unit. These units vary in size. For example, Air Force Commanders may request a DEOCS for a single Squadron, a Group comprised of multiple Squadrons, or entire Wing that includes multiple Groups. Therefore, a “unit” may comprise multiple commands. Because of this, the fidelity of the aggregation statistics presented in the current paper may lose value. Additional unit-level analyses will be conducted after the survey is released, allowing aggregation of complete units/organizations. Additionally, once we have a more robust dataset, we will explore different levels of analyses (e.g., based on sub-UICs or ‘breakout reports by department, division, Squadron, etc.). The remainder of this section will discuss the aggregation statistics for the trust in leadership climate scales.

### **Sample Description**

This section describes the demographic characteristics of the sample of individuals used for the aggregation statistics. These individuals come from units containing 16 or more individuals ( $n = 1,789$ ). The variables are displayed according to the individual’s selections. The Service branch representation of this sample includes: 33.6% Army ( $n = 539$ ), 27% Navy ( $n = 435$ ), 37% Marine Corps ( $n = 593$ ), 2.2% Air Force ( $n = 36$ ), and .1% Coast Guard ( $n = 1$ ). The majority of respondents are male ( $n = 1,389$ ; 77.6%).

### **$r_{wg}$**

Averaged  $r_{wg(j)}$  results indicate marginal average within-group agreement for the trust in leadership climate ( $r_{wg(j)} = .36$ ). However these results should be interpreted with caution, because the  $r_{wg(j)}$  coefficient was used on the sample as a whole, rather than individually for each group. Additionally, while .70 is viewed as the rule-of-thumb cut-off, the .36 coefficient obtained in this instance may be acceptable, since the .70 value is viewed as an arbitrary cut-off point (Harvey & Hollander, 2004). One limitation of the  $r_{wg(j)}$  index is that, if the null distribution does not reflect random responses, the index loses strength of interpretability. Because of this limitation, we examined additional interrater agreement indices, including  $AD_M$ ,  $ICC(I)$ , and  $ICC(K)$  (Agle et al., 2006).

### **Mean Average Deviation**

The mean  $AD_M$  for each item never exceeded the critical value identified for a seven-point response scale (i.e., 1.2; Burke & Dunlap, 2002). Additionally, the average of the  $AD_M$  indices suggest high within-group agreement ( $AD_{M(j)} = 1.35$ ).

### **Intraclass Correlations**

Intraclass correlations were conducted to determine the amount of variance that can be explained by the unit (LeBreton & Senter, 2008). This analysis demonstrated a small effect

( $ICC(1) = .04$ ), suggesting that 10% of the variability in individual's responses can be explained by group membership. The mean ratings did not reliably distinguish units, as the obtained  $ICC(2)$  value of 0.54 approached the cutoff value of .60 posited by Glick (1985).

### **One-Way Analysis of Variance (ANOVA)**

The discriminant power of the Trust in Leadership scale was assessed using one-way Analysis of Variance (ANOVA) procedures. Hays (1981) suggests that an F ratio  $> 1.00$  provides the minimal evidence for differences across groups. The F ratio for Trust in Leadership across units in our sample met this criterion [ $F(60, 1790) = 2.16, p < .01$ .]

Thus, taken together, the pattern of the interrater agreement indices and results of the one-way ANOVA provide initial support for aggregating these data to the unit level.

### **Conclusion**

The revised Trust in Leadership factor will now refer to members' expectations that their immediate supervisor will: act in the best interest of the organization; follow through with actions that affect the outcomes of others; and act in a fair and equitable manner (Dirks, 2000; Hogan, Curphy, & Hogan, 1994; Whitener, Brodt, Korsgaard, & Werner, 1998). The results from the earlier analyses support a four-item factor for trust in leadership; these items are considered to be one factor, and can be aggregated to the unit level. The final four items selected are presented in Table 6; the final item descriptive statistics and reliability analysis results for the seven-point items are provided in Table 3 and Table 4. We plan to conduct future analysis to determine correlations with theoretically-related items to establish convergent and discriminant validity.

**Table 6.**

***Final Trust in Leadership Items***

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<b>Item</b>
I can rely on my immediate supervisor to act in my organization's best interest.
My immediate supervisor follows through with the commitments he or she makes.
I feel comfortable sharing my work difficulties with my immediate supervisor.
My immediate supervisor treats me fairly.

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