Command Leadership DEOCS 4.1
Construct Validity Summary

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DEOMI PRESS

Technical Report #15-18

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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 paper details the work conducted to modify the factor of Leadership Cohesion so that it focuses more explicitly on the members' perceptions of the organization's senior most leader. . Included is a review of the DEOCS 4.0 description of the factor and items, followed by the proposed transition to the factor.

The DEOCS 4.0 description of leadership cohesion is "the perception that higher-level leaders in the organization work together, and support and trust each other." This factor includes four items (Table 1). However, one of the limitations of this factor is that many if not most survey takers often lack sufficient information to answer these items. Most members of a DoD organization do not have enough daily interactions with the commander and senior level leaders to know how these leaders communicate with one another, or work together as a team. Thus, a new factor was proposed that could more effectively encompass organizational members' perceptions of their senior leader.

As there was no single factor described in the literature that could effectively comprise all aspects of senior leadership, the creation of the Command Leadership factor involved (1) reviewing the areas of literature concerning leadership roles, styles, and effectiveness; (2) using the information found in the literature to create a definition of command leadership; (3) identifying relevant items within various leadership measures (4) piloting items on the DEOCS; (5) examining variance and descriptive statistics; and (6) selecting items that demonstrate the strongest scale properties for command leadership.

The resulting definition created from this literature review describes command leadership as "the perception that the organization's senior leader demonstrates concern for the well-being of his or her organizations' members, and provides clear communication of the organization's goals, direction, and vision."

Table 1.
DEOCS 4.0 Leadership Cohesion Items

DEOCS 4.0
1. Leaders in my organization work well together as a team.
2. Leaders in my organization support each other to get the job done.
3. Leaders in my organization are consistent in enforcing policies.
4. Leaders in my organization communicate well with each other.

Literature Review

In reviewing areas of research most relevant to perceptions of leadership effectiveness, several themes appeared in the literature. These themes included: the management and communication of knowledge throughout the organization; creating and communicating organizational goals; critical leadership roles and styles, such as transformational leadership; and demonstrating ethical leadership behaviors in the interest of the organization and its members. While the initial goal was to focus on leaders at the highest levels of the organization, there were

limited results addressing this specific area. Thus, the search was broadened to include perceptions of effective leadership across multiple levels of the organization, with focus on top management teams and senior leaders where applicable.

One way in which senior leaders impact organizational performance is through the effective design and practice of management information systems (Lord and Maher, 1991). The management of knowledge and information with the organization is a critical role for leaders and, in particular, for leaders at the top levels of the organization. Specifically, high level leaders create knowledge management systems by clearly communicating objectives or information through teams of people, putting in place knowledge transfer practices, implementing information technology systems, and using various other means to create clear channels of communication throughout the organization. In a study of top level executives, researchers found that effective management of knowledge and information through these means were linked with higher perceptions of leadership effectiveness, and was even linked to higher actual organizational performance (Lakshman, 2008).

Another critical role of senior leaders is to motivate members to accomplish specific organizational goals. The leader can do this through clarifying member expectations, defining problems that lay ahead, establishing future objectivities, and giving specific advice or instructions on how to reach the set goals (Hooijberg & Choi, 2000). In fact, the results of one study suggest that leaders who practiced these behaviors were seen as the most effective by their peers, superiors, and subordinates when compared to other leaders who were more competent in other areas (Hooijberg & Choi, 2000).

Transformational leadership is a specific style of leadership that involves the leader taking actions to create a collective vision for the organization, to inspire motivation among subordinates, to provide individualized consideration to subordinate needs, and to encourage intellectual stimulation among organizational members (Bass, 1985). Research has demonstrated that leaders who practice transformational leadership positively influence long-term behaviors of the subordinates who work under them (Bass & Riggio, 2006). One study in particular found that this impact was greater when the leader had been able to establish clear and challenging mission-related goals for the individuals they were leading (Caillier, 2014). These findings go hand-in-hand with the above-stated role of the leader in clarifying goals and motivating followers to achieve them (Hooijberg & Choi, 2000).

Additional research conducted in a military setting on senior military leaders found that transformational leadership was a significant predictor of situational awareness and interpersonal influence, and thus improved the operational readiness of those leaders and their teams (Eid, Johnsen, Brun, Laberg, Nyhus, & Larsson, 2004).

Finally, one critical role of a senior leader is to model ethical behaviors, in order to shape the culture of the organization in a positive manner (Brown & Trevino, 2012). The senior leader's level of "ethical leadership" has a significant impact on member attitudes and behaviors at all levels of the organization (Hansen, Alge, Brown, Jackson, & Dunford, 2012). In order to fulfill the role of the ethical leader, the senior leader must take actions in the organization and member's best interest.

In summary, the literature has identified several activities in which leaders may engage that can significantly impact organizational and member performance. These activities include clearly communicating information throughout the organization, clarifying goals and motivating employees to attain these goals, showing individualized concern for followers, and modeling ethical behaviors in line with the organization and member's best interests.

Items for Command Leadership were selected based on the themes that emerged from the literature. As previously mentioned, no single scale encompassed all of these leadership roles and behaviors that characterize effective senior leadership performance. In order to capture the management of knowledge and information, one item was selected and adapted from Laksham's (2009) Knowledge Management scale, which measures the management of knowledge by CEOs. The clarification and structuring of organizational goals was captured by adapting two items from Hooijberg and Choi's (2000) leadership Goal Achievement scale. Two aspects of transformational leadership, communicating a clear vision for the future and demonstrating concern for followers, were selected from Carless, Wearing, and Mann's (2000) shortened Global Transformational Leadership scale. Finally, two items from Brown and Trevino's (2005) Ethical Leadership scale were selected to capture the aspect of leader's acting in the organization and member's best interests.

Data Analysis

Sample Description

This section shows the demographic characteristics of the current sample (n = 3,227), collected from 5 July 2016 through 9 July 2016 in Table 2. The variables reflect the individual respondents' selections (except for branch of service, which is reported by the organization's survey administrator).

Table 2.
Sample Demographics of Command Leadership Items Piloted on DEOCS

	n	%
Branch of Service		
Army	1,244	38.5%
Navy	1,024	31.7%
Marine Corps	514	15.9%
Air Force	167	5.2%
Coast Guard	7	.2%
National Guard	157	4.9%
Component		
Active Duty	2,223	94.8%
Reserve	121	5.2%
Gender		
Male	2,518	78.0%
Female	709	22.0%
Seniority		
Junior Enlisted (E1 – E3)	579	22.9%
Non-Commissioned Officer (E4 – E6)	1,378	54.4%
Senior Non-Commissioned Officer (E7 – E9)	256	10.1%
Junior Officer (O1 – O3)	195	7.7%
Senior Officer (O4 and above)	125	4.9%

Item Descriptive Statistics and Reliability

This section displays descriptive statistics for the command leadership items. All items were measured on a seven-point scale from *strongly disagree* to *strongly agree*. All scales had a

value range of 1 through 7. All reliability analyses were conducted using Cronbach's Alpha. The reliability coefficients for the scale were adequate, with α = .96. Additional descriptive statistics and reliability estimates are respectively provided in Table 3 and Table 4.

Table 3.
Descriptive Statistics of Prospective Command Leadership Items Piloted on DEOCS

Item	Mean	SD	Skewness	Kurtosis
My senior leader puts processes in place to facilitate the sharing of information throughout the organization.	5.33	1.65	-1.03	0.26
My senior leader clarifies our organization's goals and priorities.	5.46	1.59	-1.17	0.64
My senior leader brings a sense of order into our organization.	5.34	1.68	-1.06	0.26
My senior leader communicates a clear vision for the future.	5.27	1.70	-0.98	0.07
My senior leader gives recognition to the organization's members.	5.39	1.67	-1.13	0.49
My senior leader listens to the concerns of the organization's members.	5.31	1.71	-1.04	0.21
My senior leader acts in the organization's best interest.	5.51	1.61	-1.20	0.74

Note: n = 3,227. The Std. Error for Skewness is .04 and Kurtosis is .09

Table 4.
Reliability Analysis of Prospective Command Leadership Piloted on DEOCS

Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
My senior leader puts processes in place to facilitate the sharing of information throughout the organization.	0.82	.96
My senior leader clarifies our organization's goals and priorities.	0.87	.96
My senior leader brings a sense of order into our organization.	0.90	.95
My senior leader communicates a clear vision for the future.	0.89	.95
My senior leader gives recognition to the organization's members.	0.84	.96
My senior leader listens to the concerns of the organization's members.	0.87	.96
My senior leader acts in the organization's best interest.	0.86	.96

Note: α = .96

Principal Components Analysis

After examining the descriptive statistics and reliability analyses on all command leadership items, three items were removed. The item concerning the senior leader acting in the organization's best interest was removed for same reason we decided to move away from the leadership cohesion scale, namely that members are not likely able to effectively answer the item without regular exposure to the leader's actions. The other two items were removed due to their redundancy with other scale items.

Factor analysis was conducted on the remaining four items. 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 = 11,096.98; $p < .01$). 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 analyse these data.

The principal components analysis yielded a single factor solution, with a cumulative 84% of the variance explained by that component. These results suggest that the definition of Command Leadership as a single construct is supported. Refer to Table 5 for more information.

Table 5.
Principal Component Analysis Pattern Matrix of Command Leadership Items

Items	**Component 1**
My senior leader puts processes in place to facilitate the sharing of information throughout the organization	.89
My senior leader communicates a clear vision for the future.	.93
My senior leader listens to the concerns of the organization's members.	.90
My senior leader clarifies our organization's goals and priorities.	.93

Note. All items loaded on to one factor.

Aggregation Statistics of Final Command 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 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 Command Leadership Climate scales.

Sample Description

This section contains the demographic characteristics of the sample of individuals used for the aggregation statistics. These individuals come from units containing 16 or more individuals (n = 971). The demographic information reflects what survey respondents provided, while Service branch membership reflects the survey administrators' selections. The Service branch representation of this sample includes: 27.2% Army (n = 264), 29.2% Navy (n = 284), 40.6% Marine Corps (n = 394), and 3% Joint Command (n = 29). The majority of respondents are male (n = 783; 80.6%).

r_{wg}

Averaged $r_{wg(j)}$ results indicate average within-group agreement for the command leadership climate ($\bar{r}_{wg(j)}$ = .50). However these results should be interpreted with caution because the $\bar{r}_{wg(j)}$ 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 .50 coefficient obtained in this instance may be acceptable, since the .70 value is viewed as an arbitrary cut-off point that should be dropped (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(1)*, and *ICC*(*K*) (Agle et al., 2006).

Mean Average Deviation (AD_M)

The mean AD_M for one item, "My senior leader clarifies our organization's goals and priorities," did not exceed the critical value of 1.2 for a seven-point response scale (Burke & Dunlap, 2002). The remaining three items slightly exceeded this cut-off point, with values ranging from 1.25-1.28. The average of the AD_M indices suggest within-group agreement approaching significance ($AD_{M\,(J)=}$ 1.25).

Intraclass Correlations

Intraclass correlations were calculated to determine the amount of variance that can be explained by the unit, and can be interpreted similarly to effect size, with a value of 0.01 considered a "small" effect, a value of 0.10 considered a "medium" effect and a value of 0.25 considered a "large" effect (LeBreton & Senter, 2008). This analysis demonstrated a small effect *(ICC(1)* = .04), suggesting that 4% 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 0.51 approached the cutoff value of .60 posited by Glick (1985).

One-Way Analysis of Variance (ANOVA)

The discriminant power of the Command 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 Command Leadership across units obtained from our sample met this criterion [F (38, 970) = 2.01, p < .01].

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

Conclusion

The revised Leadership Cohesion factor will now be titled "Command Leadership," and refers to the perception that the organization's senior leader demonstrates concern for the well-being of the organization's members, and provides clear communication of the organization's goals, direction, and vision. The results from the previous analyses support a four item factor for Command Leadership. These items are considered to be one factor, and can be aggregated to the unit level. The final four items are presented in Table6 and Table 7. We plan to conduct additional analyses in the future to determine correlations with theoretically-related items to establish convergent and discriminant validity.

Table 6.

Descriptive Statistics of Final Command Leadership Items

Item	Mean	SD	Skewness	Kurtosis
My senior leader puts processes in place to facilitate the sharing of information throughout the organization.	5.33	1.65	-1.03	.26
My senior leader clarifies our organization's goals and priorities.	5.46	1.59	-1.17	.65
My senior leader communicates a clear vision for the future.	5.27	1.70	-.98	.07
My senior leader listens to the concerns of the organization's members.	5.31	1.71	-1.04	.21

Note: n = 3,227. The Std. Error for Skewness is .03 and Kurtosis is .05.

Table 7.

Reliability Analysis of Final Command Leadership Items

Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
My senior leader puts processes in place to facilitate the sharing of information through the organization.	0.81	0.92
My senior leader clarifies our organization's goals and priorities.	0.87	0.90
My senior leader communicates a clear vision for the future.	0.87	0.90
My senior leader listens to the concerns of the organization's members.	0.82	0.92

Note: α = .93

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