Job Satisfaction 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 paper details the work conducted to modify the factor of Job Satisfaction to create a construct that focuses more specifically on satisfaction with the job. Included is a review of the 4.0 description and items, followed by the proposed modifications to the factor.

The DEOCS 4.0 description provided for job satisfaction is "the perception of personal fulfillment in a specific vocation, and sense of accomplishment and pride in accomplishing assigned duties." Revising the job satisfaction factor involved (1) reviewing the civilian and military job satisfaction literature; (2) revising the definition to focus on an affective satisfaction of the job (rather than the work within the job); (3) piloting items on the DEOCS; (4) examining the descriptive statistics, exploratory factor analysis results, and aggregation statistics; and (5) reporting the descriptive statistics, exploratory factor analysis results, and aggregation statistics of the proposed three-item scale.

Table 1.
DEOCS 4.0 Job Satisfaction Items

DEOCS 4.0
1. I like my job.
2. I feel satisfied with my present job.
3. Most days I am enthusiastic about my work.
4. I find real enjoyment in my work.

Literature Review

Job satisfaction has been conceptualized in many ways, including the fondness an individual has for his or her job (Spector, 1997), a cognitive appraisal of one's job, the affective reaction to one's job, and the attitude an employee holds toward his or her job (Brief et al, 1998; Spector, 1997; Weiss, 2002). While job satisfaction has been discussed many ways in the organizational literature, it is generally accepted that it refers to an attitude directed toward the job or its components, and includes evaluative and affective components. Job satisfaction has been discussed as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke, 1976, p. 1300), and as a "positive (or negative) evaluative judgment one makes about one's job or job situation" (Weiss, 2002, p. 175).

Recently, the literature examining job satisfaction has begun to overlap with work on the construct of job engagement. While job engagement has some conceptual relation to job satisfaction, it is conceptually and empirically distinct from job satisfaction (Alcaron & Lyons, 2011). That is, job satisfaction results from perceptions and affect that are directed toward the job or facets of the job (Spector, 1997), while job engagement is focused on the work activities themselves (Maslach & Goldberg, 1998). Similarly, research examining job satisfaction also overlaps with that of job involvement. While job involvement is identified as a cognitive

construct, job satisfaction includes both cognitive and affective components (Weiss & Cropanzano, 2002). After reviewing the literature on job satisfaction, we determined that the present 4.0 definition could be improved by more specifically targeting the nuances of the construct. That is, the goal of modifying the definition was to tease out job satisfaction from the constructs of engagement and involvement, resulting in the following factor description for job satisfaction in DEOCS 4.1: Job satisfaction refers to an attitude that reflects a positive or negative affective judgment of your current job.

Item Development

The main goal of item development was to select items that fully and succinctly cover the DEOCS 4.1 definition of job satisfaction. Two items from DEOCS 4.0 were retained and revised, as they were consistent with the DEOCS 4.1 definition of job satisfaction. These items (see Table 1) were revised to include the word "current". This revision was based on subject matter expert (SME) suggestions to clarify the referent. Items 3 and 4 (see Table 1) were eliminated, as they adhere more closely to the definition of engagement and involvement. "I am happy with my current job" was presented to SMEs as an additional item to assure the full coverage of the definition; they in turn reviewed and agreed upon the relevancy of the items prior to collecting data. This yielded a total of three items (see Table 2).

Table 2.
Job Satisfaction Items

Item
I like my current job.
I feel satisfied with my current job.
I am happy with my current job.

Data Analysis

Sample Description

This section shows the demographic characteristics of the current sample (n = 5,243), collected from 14 July 2016 through 19 July 2016 in Table 3. The variables reflect the individual respondents' selections (except for branch of service, which is reported by the organization's survey administrator).

Table 3.
Sample Demographics of Job Satisfaction Items Piloted on DEOCS

	n	%
Branch of Service		
Army	2,035	38.8%
Navy	1,457	27.8%
Marine Corps	925	17.6%
Air Force	130	2.5%
Coast Guard	5	<1.0%
National Guard	559	10.7%

	n	%
Component		
Active Duty	3,409	87.6%
Reserve	484	12.4%
Gender		
Male	4,100	78.2%
Female	1,143	21.8%
Seniority		
Junior Enlisted (E1 – E3)	1,047	23.5%
Non-Commissioned Officer (E4 – E6)	2,363	53.0%
Senior Non-Commissioned Officer (E7 – E9)	463	10.4%
Junior Officer (O1 – O3)	362	8.1%
Senior Officer (O4 and above)	225	5.0%

Item Descriptive Statistics and Reliability

This section displays descriptive statistics for the revised job satisfaction items. All items were measured on a seven-point scale from *strongly disagree* to *strongly agree*. All reliability analyses were conducted using Cronbach's Alpha. The reliability coefficient was adequate, with $\alpha = .98$. For more information on the items descriptive statistics or the reliability, refer to Table 4 and Table 5.

Table 4.
Descriptive Statistics of Prospective Job Satisfaction Items Piloted on DEOCS

Item	Mean	SD	Skewness	Kurtosis
I like my current job.	5.11	1.92	-.91	-.40
I feel satisfied with my current job.	5.00	1.94	-.83	-.56
I am happy with my current job.	4.97	1.95	-.78	-.65

Note: n = 5,251. The Std. Error for Skewness is .03 and Kurtosis is .07 for the scale.

Table 5.
Reliability Analysis of Prospective Job Satisfaction Items Piloted on DEOCS

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I like my current job.	9.97	14.66	.94	.97
I feel satisfied with my current job.	10.07	14.47	.95	.96
I am happy with my current job.	10.11	14.28	.95	.96

Note: scale level $\alpha = .98$.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) is a tool for consolidating the measured variables into a smaller number of factors (Tabachnick & Fidell, 1996). Prior to analyses, the data were tested for normality using the Kolmogotov-Smirnov statistic (Chakravart, Laha, and Roy, 1967); the test was significant, indicating non-normality.

Fabrigar, Wegener, MacCallum, and Strahan (1999) suggest utilizing principal factor methods if the data violate the assumption of normality. Costello and Osborne (2005)

recommend utilizing oblique rotation (which assumes correlations among factors) over orthogonal rotation (which does not assume the correlation between factors), because it more accurately depicts the relationship among variables. Based on these recommendations, EFA was conducted using principal axis factoring with oblique rotation, specifically direct oblimin rotation.

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 BTS was significant (χ^2 (3) = 22,122.49; p <.01), therefore allowing 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 (George & Mallery, 2006).The KMO measure was also employed to compare the sum of the squared correlation coefficients and the squared partial correlation coefficients. Kaiser (1974) suggests KMO values greater than .5 should be deemed acceptable. The obtained statistic was .79, indicating a good fit, again suggesting that a factor analysis is an appropriate statistical method to analyze these data.

The principal factor analysis yielded a single factor solution explaining over 93% of the variance, which suggests that the theoretical definition of Job Satisfaction as a single construct is supported. Each item exhibited strong primary loadings on the factor, according to published recommended factor loading strengths (Costello & Osborne, 2005)[1] Refer to Table 6 for more information.

Table 6.
Principal Component Analysis Pattern Matrix of Job Satisfaction Items

	Factor
Items	**1**
I like my current job.	.95
I feel satisfied with my current job.	.96
I am happy with my current job.	.97

Note. All items loaded on to one factor.

Aggregation Statistics

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).

[1] Due to the single factor solution, the solution could not be rotated.

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 1 September 2016 and 9 September 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 belong 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 Job Satisfaction scale.

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 = 1,789). 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: 28.3% Army (n = 506), 26.1% Navy (n = 467), 33.9% Marine Corps (n = 606), and 10.2% National Guard (n = 183). The majority of respondents within this sample are male (n = 1,387; 77.5%).

Within-Group Agreement

Within-group agreement indexes help determine if the construct that is supposed to be shared at the group level actually demonstrates agreement among respondents within that group. Several within-group agreement indices for Job Satisfaction were explored, including: r_{wg}, AD_M, *ICC(1*), *ICC*(*2*).

r_{wg} *Statistic.*

The r_{wg} compares the observed within-group variances to an expected variance from random responding. This is a consensus measure or index of agreement within-group(s). LeBrenton and Senter (2008) suggest interpreting r_{wg} on a continuum of agreement, with values between .00 and .30 indicating a *lack of agreement*, .31 to .50 as *weak agreement*, .51 to .70 as *moderate agreement*, .71 to .90 as *strong agreement*, and .91 to 1.00 as *very strong agreement*. The averaged $r_{wg(j)}$ results for Job Satisfaction was .16, suggesting lack of agreement.

Mean Average Deviation (AD_M*)*

The mean average deviation (AD_M) can be interpreted such that 0 indicates complete agreement. Using the seven point response scale, an upper limit cut-off of 1.2 was utilized to determine within-group agreement (Burke & Dunlap, 2002); thus, AD_M scores that fall below 1.2

represent satisfactory group agreement. The AD_M indices for the Job Satisfaction scale was 1.48, exceeding the 1.2 cut-off, thereby suggesting weak within-group agreement.

Intraclass Correlations

The *ICC(1)* explains the total variance that can be explained by group (i.e., unit) membership. 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). Specifically, an *ICC(1)* of .10 can be interpreted as 10% of the variability in individual's responses is explained by group membership (Bliese, 2000). A small-to-medium effect was found for the Job Satisfaction scale, suggesting that 7% of an individual's responses can be attributed to unit membership.

ICC(2) is an estimate of the reliability of the group means. Thus, an *ICC(2)* indicates whether groups can be reliably differentiated based on the group mean. Although there are no strict standards of acceptability for *ICC(2)* values, Glick (1985) recommended an *ICC(2)* cutoff of .60. The *ICC(2)* score fell just above the cut-off *ICC(2)* = .68; suggesting the mean ratings reliably distinguished units, and that aggregation was justified.

Between-Group Differentiation

The between-group differentiation for the Job Satisfaction scale was explored. Between-group analyses help determine if the groups that are expected to differ actually differ. A one-way analysis of variance (ANOVA) was performed to determine if minimal evidence exists for difference across groups.

One-Way Analysis of Variance (ANOVA)

The discriminant power was assessed for the Job Satisfaction scale to determine if differences among groups exist. The discriminant power was assessed using the one-way Analysis of Variance (ANOVA) procedure. Hays (1981) suggests that an *F* ratio > 1.00 provides the minimal evidence for differences across groups. The *F* ratio for Job Satisfaction across units obtained from our sample met this criterion [F (60, 1,728) = 3.01, $p < .01$].

Taken together, the aggregation statistics and the results of the one-way ANOVA provide initial support for aggregating these data to the unit level.

Conclusion

The revised Job Satisfaction factor refers to an attitude that reflects a positive or negative affective judgment of an individual's current job. The results from the previous analyses support a three item factor for job satisfaction. These items are considered to be one factor, and can be aggregated to examine job satisfaction at the unit level. The final three items selected are presented in Table 2.

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