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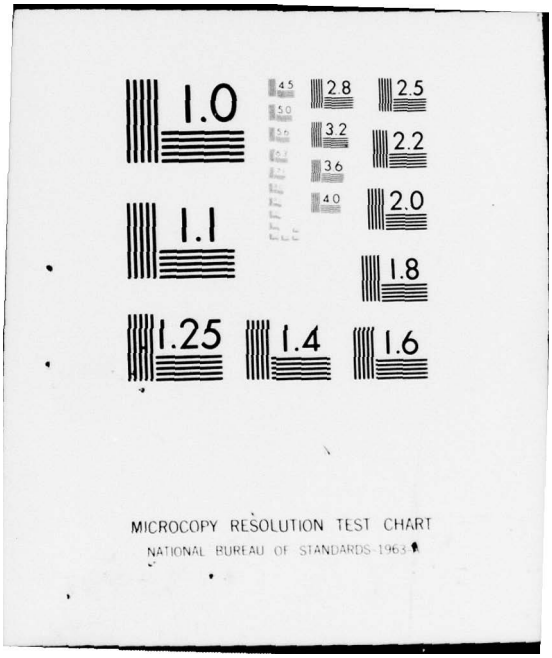
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A NOTE ON THE STABILITY OF THE JOB DESCRIPTIVE INDEX (J. D. I.)

BENJAMIN SCHNEIDER

H. PETER DACHLER

Research Report No. 18

May, 1978

The writing of this paper was supported by the Personnel and Training Research Programs, Psychological Sciences Division, Office of Naval Research under Contract No. N00014-75-C-0884, Contract Authority Identification Number, NR 151-375, Benjamin Schneider and C. J. Bartlett, Principal Investigators.

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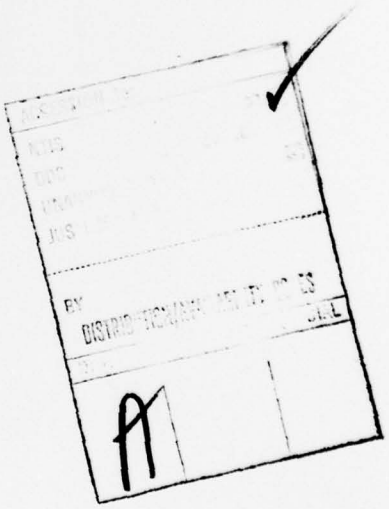
Coast Utility employees. Data analyzed within a Campbell & Fiske (1959) multitrait (JDI Dimensions) - multimethod ($time_1$ /$time_2$ administration) matrix revealed good stability coefficients ~~(r_{tt} of about .57)~~ and also indicated that the five JDI satisfaction scales retain their relative independence over time. Some problems regarding the theoretical meaning of these results are briefly discussed.



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A NOTE ON THE STABILITY OF THE JOB DESCRIPTIVE INDEX (J. D. I.)[1]

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Increasingly social scientists have utilized attitude measures as predictors, criteria, or in other time-based ways (e.g., periodic surveys) rather than as static assessment devices. When a measure is employed in a time-based mode, stability ("retest reliability"), not internal consistency, is the critical index of reliability. This is true because the degree to which a measure correlates with itself over time is one of the limiting factors on the potential for the measure to correlate with (predict or be predicted by) another measure. Over time, a measure cannot correlate with another measure greater than the square root of stability as indexed by the Pearson r (cf. Nunnally, 1967).

A carefully developed and frequently used attitude measure in organizational research is the Job Descriptive Index (Smith, Kendall, & Hulin, 1969). This measure has been used in probably hundreds of studies. The methodological rigor employed during its construction and validation, its normative data, its relatively low required reading level (about 7th grade), and the fact that it assesses satisfaction with five of the most basic or generally most visible aspects of a person's work role (work, pay, promotion, supervision, and co-workers), most

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[1] The authors wish to thank Patricia C. Smith for permission to use the JDI in this study and John Parkington and Bruce Katcher for helping with the reported data analyses.

likely account for the JDI's attractiveness to researchers.

Considerable data on the validity of the JDI is now available (cf. Locke, 1976) in addition to the external and convergent and discriminant validity (Campbell & Fiske, 1959) data presented in the original publication of the measure (Smith et al., 1969). However, there is very little information about the stability of the JDI. Smith et al. (1969, p. 75) found stability correlations from .45 to .75 on 45 employees over a period of three years. The authors are not aware of any other stability data on the JDI in the literature. As a result of a fortuitous opportunity to use the JDI on a large and very diverse sample of working adults, this study further investigates the dimensional stability of the JDI.

Method

Sample

As part of a larger periodic survey of employee panels in an Atlantic coast utility, the JDI was administered twice within a period of 16 months. There were 847 employees, 541 management and 306 non-management, who participated in both administrations; they constitute the sample of interest in the present study.

Both the management and non-management personnel were drawn from all five divisions of the geographically dispersed utility and, within each division, all five departments (ranging from sales to engineering) were included. In addition, both samples included a wide range of tenure in the company (about 60% of the managers had more than 15 years tenure in the company, whereas 40% of the non-management people passed

that tenure mark).

The management sample included 10% minority members and 70% were male. All levels of management were represented. The non-management sample was characterized by 20% minority members, about 50% males, and people from all non-management positions ranging from janitorial to professional-non-management.

Procedure

The JDI was part of a larger survey in both administrations, appearing last within the questionnaire in both cases. The typical employee probably spent between 30 and 40 minutes completing the entire survey which they received at the work place. Because employees identified themselves with Social Security numbers, the correlational analyses to be presented were possible. Great care was taken in obtaining the trust and cooperation of panel members.

Results and Discussion

Table 1 presents the complete matrix resulting from the intercorrelations of the two administrations for managerial personnel as the lower triangle entries; in the upper triangle the same data for the non-management sample are presented. The pattern of stability coefficients are quite high and quite similar for both samples with an average $\bar{r}_{tt}$ for managers equal to .56 and for non-managers, .58. These stability coefficients are of similar magnitude to those obtained by Smith et al. in the three-year study noted earlier.

For both the management and non-management samples in the present project, stability is lowest for satisfaction with supervision (.46 for

Table 1

JDI Scale Intercorrelations for Two Administrations Separated by Sixteen Months; Stability in Parentheses

Management (N=541) in Lower Triangle; Non-Management (N=306) in Upper Traingle

	Time 1					Time 2				
Time 1	Work	Pay	Promo	Sup	Cowo	Work	Pay	Promo	Sup	Cowo
Work	--	23	26	37	31	(66)	11	21	16	29
Pay	15	--	37	23	12	18	(62)	19	14	08[a]
Promotion	21	32	--	31	19	19	26	(56)	23	17
Supervision	33	14	24	--	33	26	17	23	(49)	22
Coworkers	40	20	18	28	--	19	24	14	21	(58)
Time 2										
Work	(61)	15	16	21	34	--	11	29	25	33
Pay	07[a]	(61)	23	11	13	10	--	32	19	12
Promotion	17	25	(64)	18	18	22	25	--	33	21
Supervision	23	10	17	(46)	27	32	15	29	--	24
Coworkers	28	22	17	18	(47)	33	19	24	34	--

Note: decimals omitted

[a]Correlation significant at $p < .10$; all others significant at $p < .05$.

management, .49 for non-management). However, even at this level of stability, it is clear that, at least for this sample, the JDI, relative to other criteria, is quite stable and should prove useful in time-based studies. Schmidt and Hunter (1977), for example, report an average expected re-test reliability for criteria in personnel selection studies of .60, approximately the results obtained in the present research.

Some other data of potential interest in terms of dimensional stability is revealed in the tables, if one treats the two administrations of the JDI separated by 16 months as two methods of assessing different job facet satisfaction. This assumption allows one to examine the $time_1/time_2$ (methods) and satisfaction facets (traits) matrix for dimensional stability of the different JDI components, analogous to the logic of convergent and discriminant validity (Campbell & Fiske, 1959).

In doing so, one notes that in every case: (1) The heteromethod-monotrait stability diagonals ($time_1/time_2$, same traits) are higher than the heteromethod-heterotrait off-diagonal ($time_1/time_2$, dissimilar traits) correlations; and, (2) The stability diagonals are stronger than the monomethod-heterotrait correlations (revealed in the $time_1$ intercorrelation matrix and $time_2$ intercorrelation matrix). In other words, not only do the JDI facet satisfaction scales reveal stability over time but they retain their relative independence over time.

A summary procedure for interpreting these kinds of data is available through the ANOVA computations presented by Kavanagh, MacKinney and Wolins (1971). This procedure allows for an estimate of the variance in the multitrait-multimethod matrix attributable to convergent validity,

discriminant validity, method bias, and error. If one conceptualizes two administrations of the same measure as two methods, then convergent stability, following the Kavanagh et al. arguments, is inferred from respondent variance which indicates the overall degree of respondent agreement across the first and second administration of the JDI and over the five dimensions of the JDI. Discriminant stability is indicated by the Respondents X JDI dimensions variance which shows the degree of discrimination among the five JDI dimensions over time. Method bias is assessed on the basis of Respondents X Administration variance which indicates the amount of variance due to the particular self-report method of the JDI.

Table 2 shows the results of this summary analysis for the management and non-management samples. The main effects and interactions are all statistically significant, indicating convergent stability, discriminant stability, and method bias. However, looking at the four variance components, method bias is negligible for both samples in comparison to the other sources of variance. Furthermore, the variance components for Respondents (convergent stability) and for Respondents X JDI dimensions (discriminability of the JDI dimensions over time) are approximately equal, and similar in magnitude to error variance. These facts suggest that the JDI over time is stable, that its stability is matched by its capacity to distinguish between the five dimensions of satisfactions, that the method bias of the JDI is relatively insignificant, and that from the perspective of practical significance, the JDI over the two administrations accounts for as much known sources of variance as unknown (error)

Table 2

Analyses of Variance of Correlations From Table 1,

With Variance Components

Source	Management				Non-Management			
	df	MS	F	Variance Component	df	MS	F	Variance Component
Respondents (R) (Convergent Stability)	532	3.304	8.522*	.291	295	3.390	9.489*	.302
R x JDI Dimensions (Discriminant Stability)	2128	1.125	2.902*	.368	1180	1.137	3.183*	.389
R x Administration (Method Bias)	532	.663	1.71*	.055	295	.668	1.871*	.062
Error	2128	.388		.387	1180	.357		.356

* $p < .001$

variance.

An issue that is difficult to resolve is raised in attempting to establish the theoretical meaning of the convergent and discriminant stability results obtained with the JDI. Thinking about a test-retest correlation coefficient as an index of reliability assumes that the true scores (Nunnally, 1967) are constant. However, satisfaction conceived as a resultant of the interaction between relatively stable personal characteristics (i.e., frame of reference, needs, values) and relatively dynamic environmental characteristics (cf. Locke, 1976) makes the assumption of a constant true satisfaction score problematic. The authors do not know of any intra or extra-organizational changes *during the 16 months* interval between the two JDI administrations that might <u>differently</u> affect JDI dimension scores for some subgroups but not others. If all respondents in a sample changed equally on the JDI dimensions, there would be no problem in interpreting the stability correlations. However, if <u>differential</u> changes among subgroups within a sample did occur, one cannot know the meaning of the magnitude of the observed stability coefficients. Thus, under the assumption of trait stability, the obtained stability coefficients may be too low. Under the assumption of dynamic traits, the obtained stability coefficients may be too high.

Given our still meager understanding of the dynamic nature of satisfaction, there exists no basis for a satisfactory solution to the theoretical meaning of the obtained JDI time based convergent and discriminant stability results. This lack of theoretical specification

regarding the dynamic nature of satisfaction and the resultant ambiguity regarding the meaning of *test-retest reliability* of dynamic traits, suggests a neglected domain in the definition and measurement of constructs like satisfaction.

However, with respect to the utility of the JDI as a measure of satisfaction, the reported results seem to allow the narrow conclusion that the JDI scales have some utility in predicting or being predicted by other measures over time.

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