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Assessing the Construct Validity of the Job Descriptive Index: A Review and Meta-Analysis

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The construct validity of the Job Descriptive Index (JDI) was investigated by using a meta-analysis to summarize previous empirical studies that examined antecedents, correlates, and consequences of job satisfaction. In total, 79 unique correlates with a combined total of 1,863 correlations were associated with the JDI subdimensions. The construct validity of the JDI was supported by (a) acceptable estimates of internal consistency and test–retest reliability, (b) results that conform to a nomological network of job satisfaction relationships, and (c) demonstrated convergent and discriminant validity. Contrasting results with previous meta-analytic findings offered further support for the JDI's construct validity. Limitations of the JDI and suggestions for future research are discussed.

Job satisfaction is a highly important variable in organizational studies. It is central to processes as diverse as organizational commitment (e.g., Mathieu & Zajac, 1990), employee withdrawal (e.g., Hom & Griffeth, 1995), and union representation election voting (e.g., Davy & Shipper, 1993). Job satisfaction also is the most commonly investigated dependent variable in industrial–organizational psychology (Staw, 1984) and occupational health (Kinicki, McKee, & Wade, 1996), with more than 12,400 studies published on the topic by 1991 (Spector, 1996). Among the many facet satisfaction measures that exist, the Job Descriptive Index (JDI; P. C. Smith, Kendall, & Hulin, 1969) is used more frequently than any other (Rain, Lane, & Steiner, 1991; Spector, 1986). The JDI also has been translated into and used in Spanish (e.g., Hulin, Drasgow, & Komocar, 1982; McCabe, Dalessio, Briga, & Sasaki, 1980), Hebrew (e.g., Hulin & Mayer, 1986; Ronen, 1977), and French (e.g., Johns, 1978a, 1978b), as well as a number of other languages.

Although the JDI is considered one of the most carefully constructed measures of job satisfaction in existence (Roznowski, 1989; Vroom, 1964), a comprehensive assessment of its construct validity has not been conducted since P. C. Smith et al.'s (1969) initial assessment more than three decades ago. Although selective reviews (e.g., Cook, Hepworth, Wall, & Warr, 1981; Price & Mueller, 1986) and P. C. Smith et al.'s initial review were positive, two professional standards point to the necessity of further review. First, validation is an ongoing process requiring reevaluation as evidence accumulates (Anastasi, 1986; Messick, 1995), and second, assessments of validity should be as comprehensive as possible, so as to reduce the effects of sampling error and artifacts that produce erroneous conclusions (Guzzo, Jackson, & Katzell, 1987; Roznowski, 1989).

The purpose of this article is to evaluate the construct validity of the JDI and to examine theoretical issues surrounding its use as a measure of job satisfaction. Our review is based on the unitarian conceptualization of validity (Anastasi, 1986; Landy, 1986; Messick, 1995). This perspective is based on the proposition that all psychometric evidence contributes to a gestalt or overarching assessment of construct validity. We used the powerful technique of meta-analysis to analyze data from the literature, and emphasis is placed on integrating more recent research with that reviewed by P. C. Smith et al. (1969). This review is divided into seven sections: (a) a short background section that briefly describes the JDI and its development, (b) development of a nomological network of JDI correlations, (c) a description of the meta-analytic method used to examine correlations between the JDI and variables in its logical network, (d) assessment of the JDI's internal consistency and test–retest reliability, (e) meta-analytic results, (f) confirmatory factor analytic results pertaining to convergent and discriminant validity, and (g) a summary and recommendations for future research.

Background: The JDI and Its Development

The JDI was designed to measure the construct of job satisfaction, defined by P. C. Smith et al. (1969) "as the feelings a worker has about his job" (p. 100). Their conceptualization of satisfaction included two subdomains: an evaluative–general–long-term domain, which is concerned with assessing how an individual's current job compares with other jobs over his or her lifetime, and a descriptive–specific–short-term domain, which focuses on assessing satisfaction within the day-to-day operations of an individual's current job.

The final version of the JDI was designed around five subdimensions: satisfaction with work, supervision, coworkers, pay, and

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promotion. All items are short words or phrases (e.g., "hot" for work satisfaction, "lazy" for supervision satisfaction), and respondents are asked to put a *Y* beside an item if it describes the particular aspect of the job, an *N* if the item does not describe the aspect, and a *?* if they cannot decide. Positively worded items are scored 3, 1, and 0, and negatively worded items are scored 0, 1, and 3 (for *Y*, *?*, and *N*, respectively). Although this is not a conventional approach to scaling response categories, response format research has indicated that the reliability, stability, and validity of the five JDI subscales were not significantly different across two forms of the JDI (Likert-type vs. *yes–no–?* scaling; S. M. Johnson, Smith, & Tucker, 1982). Moreover, Hanisch's (1992) evaluation of the JDI scoring system using polychotomous item response theory led her to conclude that "the overall scoring procedure is still justified today" (p. 382). For a complete description of the JDI's development, see P. C. Smith et al. (1969).

A revision of the JDI was undertaken in the early 1980s. This process resulted in replacing 11 items across four of the facet scales (the Promotion subscale was unchanged) and adding an overall measure of satisfaction, called the Job in General (JIG) scale (see Balzer et al., 1990). The number of items included in each subscale remained the same. A study by Paul, Kravitz, Balzer, and Smith (1990) supported the equivalence of the original and the revised JDI versions. More recently, Balzer, Parra, Ployhart, Shepherd, and Smith (1995) used 1,801 employees from multiple organizations to assess the equivalence of the original and revised JDI. A comparison of responses to the original and the revised JDI revealed that (a) there was no significant change in the use of the "cannot decide" response, (b) there was no significant difference in the frequency of missing data, (c) the item total correlations for the revised JDI were generally higher, (d) the subscales from the two instruments were almost perfectly correlated (for Work, $r = .96$; for Pay, $r = .97$; for Supervision, $r = .99$; and for Coworkers, $r = .98$), (e) the subscale intercorrelations were highly similar, and (f) correlations with variables in a logical network uncovered virtually identical patterns of relationships across the original and the revised JDI. These results led Balzer et al. (1995) to conclude "that the Revised JDI has . . . equivalent measurement properties" (p. 12) to those of the original JDI. This review thus distinguishes between the older and newer versions of the JDI only when there is a specific reason for doing so and when the data actually permit the drawing of such distinctions. Otherwise, the data reported are for both versions combined.

Development of a Nomological Network of JDI Correlations

Although several different theories or models can be used to derive a nomological network of job satisfaction (see Brief, 1998), we based our predictions on the original framework proposed by P. C. Smith et al. (1969) because it is the theoretical foundation of the JDI. (Note, however, that developing a theory of satisfaction was beyond the scope of this article; the network developed below is only to aid in interpreting the obtained meta-analytic results.) P. C. Smith et al. did not specifically identify causal antecedents of job satisfaction. They did suggest, however, that (a) the five facets of satisfaction would not be related to the same antecedents and (b) each facet should obtain differential relations with conceptually linked variables.

In terms of outcomes, we expected job satisfaction to correlate more strongly with employee attitudes than behavioral and performance outcomes because the action tendencies (i.e., felt desires to act; Arnold, 1960) associated with job dissatisfaction do not necessarily compel action (Locke, 1984; P. C. Smith et al., 1969). As such, job satisfaction was postulated to indirectly affect employee behavior and performance through intentions or effort (P. C. Smith & Cranny, 1968; Wanous, Poland, Premack, & Davis, 1992). The JDI was hypothesized to correlate more strongly with work-related attitudes, such as organizational commitment and job involvement, and with withdrawal cognitions than with absenteeism and turnover (Hom, Caranikas-Walker, Prussia, & Griffeth, 1992). In a similar manner, we expected the indirect relationship between job satisfaction and performance to result in stronger relations between the JDI and subjective measures of effort and motivation than between the JDI and measures of performance (P. C. Smith et al., 1969).

Meta-Analytic Method Used

Defining the Population of Relevant Studies

A systematic and comprehensive search was made in the major industrial–organizational psychology journals for studies that used the JDI. A manual search for the landmark citation of P. C. Smith et al. (1969) was first conducted on all articles published from 1975 through August 1999 in the *Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of Applied Psychology*, *Organizational Behavior and Human Decision Processes*, and *Personnel Psychology*. A total of 210 studies that used the JDI were identified. Of these 210, 58 studies were excluded because they did not contain sufficient information for inclusion in a meta-analysis (e.g., 13 studies reported only results from either item response analyses or factor analyses), leaving 152 studies containing 267 individual samples with the necessary information for inclusion in the meta-analysis.[1] In those cases in which a study reported two correlations for the same construct (e.g., self-ratings of performance on two dimensions) or when correlations were reported at two points in time, they were averaged so that only one correlation was included in that particular analysis. This procedure was necessary because meta-analysis assumes that all correlations included in the analysis are independent (Hunter & Schmidt, 1990).

Creating Correlate Categories

Our literature search revealed that the JDI was correlated with a multitude of different variables. Data coded from the 267 samples resulted in 3,453 separate correlations between a JDI dimension—or some combination of dimensions—and 487 different correlates. Given both the diversity and the number of JDI correlates, it was necessary to consolidate the database by developing broad correlate categories (James & James, 1989).

To reduce the list of 487 correlates into meaningful homogeneous constructs, we examined the original source articles for

[1] We uncovered 5 studies (containing 7 samples) that used the revised JDI. The Pay and Promotion subscales were used in only 1 sample, whereas coworker, work, and supervision satisfaction were measured in multiple samples.

Table 1
Reliability of the Job Descriptive Index Subscales

	Internal consistency reliability				Test–retest reliability			
Subscale	*K*	*M*	*SD*	Range	*K*	*M*	*SD*	Range
Pay	31	.80	.05	.69–.88	8	.65	.01	.60–.71
Promotion	27	.84	.05	.70–.92	10	.63	.14	.29–.82
Coworkers	40	.85	.05	.68–.93	9	.59	.10	.46–.78
Work	59	.81	.11	.28–.95	13	.67	.01	.49–.88
Supervision	54	.84	.06	.66–.95	10	.56	.13	.35–.71

Note. K = number of samples.

construct definitions and the associated item content of scales used to measure each correlate. Next, three of the authors (Angelo J. Kinicki, Chester A. Schriesheim, and Kenneth P. Carson) individually determined the conceptual overlap among correlates (i.e., assigned correlates to broader correlate categories). They then met as a group and used the criterion of 100% agreement to jointly classify correlates. Within each of these broad classifications, multiple correlations within the same study were averaged so that 1 correlation per correlate category was used in the meta-analysis. Furthermore, a construct was used in the meta-analysis if at least 2 correlations were reported for one or more JDI subdimensions. This process resulted in identifying 93 correlate categories with a combined total of 3,033 correlations with the JDI subdimensions. Of these 93 correlates, 79 were used in at least two different studies, resulting in the inclusion of 1,863 correlations in this study.

Analyses

The first step in the analyses was to calculate the sample-size-weighted average correlation between the JDI subdimensions and the 79 correlates by using Hunter and Schmidt's (1990) procedures. The next step consisted of correcting the weighted average correlation for attenuation by using the reliabilities reported for each sample. Because reliabilities were not reported in all studies, the average reliability reported across all studies was used when reliability was not reported for either a correlate or a JDI subscale. The final step in the analyses was to calculate credibility and confidence intervals to test for moderated relationships and to assess the significance of effect sizes by using the procedures and formulas outlined by Whitener (1990).

Reliability

Reliability of measurement is a necessary but not a sufficient condition for construct validity (Nunnally & Bernstein, 1994). Two types of reliability seem most relevant for the JDI: internal consistency and test–retest reliability.

Internal Consistency Reliability

The left-hand side of Table 1 presents the estimates of internal consistency reliability for the original JDI subscales based on the meta-analysis undertaken for this review. All estimates were based on coefficient alpha. The mean coefficients were reasonably high, and the only discordant estimate was for the Work subscale. It obtained a value of .28 in one study. Because this value was quite atypical (the next lowest value was .69), it seemed safe to conclude that it was an outlier. The average reliabilities reported in Table 1 were very similar to those found in the five studies that used the revised JDI. Average reliability estimates for the revised JDI were .87, .88, .86, .88, and .89 for satisfaction with Pay, Promotion, Coworkers, Work, and Supervision, respectively. In summary, the JDI possesses adequate internal consistency reliability.

Test–Retest Reliability

P. C. Smith et al. (1969) conceptualized satisfaction as a dynamic construct that varies over time. Thus, to be construct-valid, the JDI should be sensitive to change over time. The right-hand side of Table 1 summarizes the overall test–retest coefficients. As one might expect, the average test–retest coefficients were quite a bit smaller than their internal consistency counterparts (.21 less on average; see Table 1). The ranges shown in Table 1 also were larger, supporting the idea that job satisfaction is a dynamic state that is susceptible to change over time.

Meta-Analytic Construct Validity Results

Tables 2, 3, and 4 present our results, classified into three categories: presumed antecedents, correlates, and presumed consequences, respectively. Figure 1 shows the variables in each category.[2] We recognize that some of the presumed relations are more reasonable than others and use Figure 1 simply to help summarize results (because the purpose of this study was not to determine whether the variables examined were "truly" antecedents, correlates, or consequences of job satisfaction).

Job characteristics, role states, group and organizational characteristics, and leader relations are generally considered to be antecedents of job satisfaction (P. C. Smith et al., 1969; Spector, 1997). Table 2 shows the meta-analysis results for these variables. Affective responses represent those variables that, like job satisfaction, describe an individual's psychological and cognitive re-

[2] We should note that we deleted from the analysis results pertaining to 39 correlates because there was no clear theoretical basis on which to formulate hypotheses that could be used to evaluate the JDI's construct validity. Twenty-four correlates represented individual differences (e.g., ability and growth needs), 4 were related to unique dimensions of perceived job characteristics (e.g., dealing with others and friendship opportunities), 9 pertained to leader relations (e.g., leader upward influence and leader tolerance for ambiguity), and 2 were miscellaneous correlates (understands pay criteria and behavior–outcome instrumentality).

Table 2
Meta-Analytic Results for the Presumed Antecedents of Job Satisfaction by Job Descriptive Index Subdimension

	Pay				Promotion				Coworkers				Work				Supervision			
Presumed antecedent	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c
Job characteristics																				
Variety	8	3,425	.17	.21[a]	7	3,345	.19	.23[a]	6	1,691	.26	.32[a]	17	5,660	.44	.56[a]	11	3,892	.22	.26[a]
Identity	5	1,589	.17	.23[a]	4	1,509	.12	.16[a]	5	1,589	.21	.28[a]	11	2,359	.31	.43[a]	6	1,741	.22	.30[a]
Task significance	3	719	.13	.17[a,b]	2	639	.10	.12[a]	3	719	.19	.24[a]	7	1,270	.38	.48[a]	4	871	.17	.22[a,b]
Autonomy	7	2,558	.16	.22[a]	6	2,478	.13	.18[a]	6	1,691	.19	.24[a]	13	3,328	.32	.43[a]	8	2,710	.25	.32[a]
Feedback	5	1,589	.11	.14[a]	4	1,509	.30	.38[a]	6	1,861	.22	.28[a]	13	2,676	.30	.40[a]	9	2,328	.40	.51[a]
Job richness	9	2,968	.15	.19[a]	9	2,968	.20	.25[a]	9	3,245	.15	.18[a]	12	3,398	.39	.50[a]	11	3,329	.18	.22[a]
Role states																				
Role conflict	10	2,712	−.22	−.29[a]	10	2,712	−.24	−.30[a]	12	3,437	−.28	−.35[a]	24	4,787	−.33	−.43[a]	17	5,380	−.32	−.40[a]
Role ambiguity	10	2,712	−.13	−.17[a]	10	2,712	−.27	−.33[a]	12	3,437	−.21	−.26[a]	28	4,997	−.32	−.42[a]	17	5,380	−.35	−.43[a]
Group and organizational characteristics																				
Group goal arousal	5	1,973	.05	.06[a,b]	4	1,893	.17	.22[a]	3	1,312	.25	.32[a]	5	1,973	.24	.33[a]	5	1,973	.10	.13[a,b]
Group cohesiveness	5	2,602	.14	.18[a]	4	2,522	.20	.25[a]	8	2,723	.37	.45[a]	8	2,788	.23	.29[a]	8	2,952	.32	.39[a]
Group integration																	5	258	.19	.25[a]
Communication quality	5	3,005	.11	.15[a]	5	3,005	.16	.21[a,b]	7	3,816	.21	.27[a]	7	3,816	.21	.30[a]	7	3,816	.27	.35[a]
Participative involvement					2	476	.18	.24[a]	3	589	.07	.09[a,b]	6	1,622	.37	.48[a]	5	1,393	.39	.51[a]
Work stressors	7	4,413	−.02	−.03[a,b]	8	4,810	−.03	−.04[a,b]	10	5,053	−.02	−.03[b]	13	6,673	−.18	−.23[a,b]	10	6,324	−.13	−.17[a,b]
Inequity of work environment	5	1,179	−.42	−.52[a]																
Organizational structure	4	2,852	.18	.23[a]	4	2,852	.28	.36[a]	4	2,139	.22	.28[a]	5	3,006	.21	.28[a]	5	3,006	.28	.35[a]
Climate	2	1,463	.20	.26[a]	2	1,463	.36	.46[a]	12	5,199	.27	.32[a]	10	4,682	.22	.27[a]	12	5,199	.30	.35[a]
Leader relations																				
Leader initiating structure	15	2,339	.00	.00	14	1,026	.02	.02	18	3,757	.10	.12[a]	38	5,205	−.01	−.01[b]	52	8,717	.25	.31[a]
Leader consideration	16	1,365	.24	.29[a]	17	1,762	.23	.27[a]	19	2,783	.22	.26[a]	45	5,193	.26	.31[a]	55	7,640	.68	.80[a]
Leader production emphasis	2	418	−.05	−.06	2	418	−.02	−.03	3	492	.04	.05	9	696	−.02	−.03[b]	12	1,148	.14	.18[a,b]
Leader reward behavior	7	1,024	.26	.36[a]	7	1,024	.28	.37[a]	7	1,024	.26	.36[a]	7	1,024	.35	.48[a]	8	1,332	.71	.95[a]
Leader punishment behavior	3	296	−.02	−.04	3	296	.01	.02	3	296	.07	.10	3	296	−.08	−.12[a]	4	604	−.36	−.50[a]
Leader–member exchange					2	1,092	.26	.32[a]	3	1,246	.20	.27[a]	5	1,584	.27	.35[a]	7	1,978	.45	.57[a]

Note. *K* = number of samples in each analysis; *N* = total number of individuals in the *K* samples; *r* = uncorrected weighted average correlation; r_c = weighted average correlation corrected for unreliability.
[a] The 95% confidence interval does not include zero. (The actual confidence interval formula used is dependent on the credibility moderator.) [b] Credibility moderation indicates probable moderation ($p \leq .05$).

Table 3
Meta-Analytic Results for the Correlates of Job Satisfaction by Job Descriptive Index Subdimension

Correlate	Pay				Promotion				Coworkers				Work				Supervision			
	K	N	r	r_c	K	N	r	r_c	K	N	r	r_c	K	N	r	r_c	K	N	r	r_c
Organizational commitment	8	2,935	.29	.36[a]	10	3,870	.35	.43[a]	11	3,893	.34	.40[a]	16	5,212	.50	.60[a]	12	4,455	.35	.42[a]
Work and nonwork perceived stress	2	258	−.10	−.15[a]	2	258	−.24	−.37[a]	8	2,457	−.19	−.22[a]	26	5,603	−.22	−.27[a]	11	3,069	−.20	−.24[a]
Poor health symptoms									3	1,235	−.15	−.19[a]	3	1,235	−.13	−.16[a]	3	1,235	−.14	−.18[a]
Job involvement	14	2,900	.20	.25[a]	14	2,900	.21	.25[a]	23	5,914	.14	.17[a]	19	5,329	.33	.42[a]	19	5,586	.16	.20[a]
Life satisfaction									10	3,067	.15	.17[a]	8	2,550	.27	.32[a]	10	3,067	.15	.17[a]

Note. K = number of samples in each analysis; N = total number of individuals in the K samples; r = uncorrected weighted average correlation; r_c = weighted average correlation corrected for unreliability.
[a] The 95% confidence interval does not include zero. (The actual confidence interval formula used is dependent on the credibility moderator.)

sponses to the work environment. These variables are considered to be correlates of job satisfaction because it is difficult to specify a causal relationship between affective responses and job satisfaction (see Mathieu & Zajac, 1990). Table 3 presents the meta-analysis results for these variables. Finally, motivation, citizenship behaviors, withdrawal cognitions, withdrawal behaviors, and job performance are generally considered to be consequences of job satisfaction (Fisher & Locke, 1992; Hom & Griffeth, 1995; Spector, 1997). Table 4 presents the meta-analysis results for these assumed outcomes.

Presumed Antecedents of Job Satisfaction

Job characteristics. One primary prediction is relevant for assessing this component of the job satisfaction correlate network. Measures of job characteristics were expected to obtain higher correlations with the JDI Work subscale than with any other subscale because P. C. Smith et al. (1969) suggested that job characteristics are presumed antecedents of this specific facet of job satisfaction.

Results shown in Table 2 largely supported this predicted relationship. First, all of the correlations between the JDI subscales and the job design presumed antecedents were positive and significantly different from zero. Second, the work facet obtained a significantly higher correlation with the various job characteristics than did the other JDI facets. The average corrected correlation between work satisfaction and the set of job characteristics was .47, whereas the average was .24 ($z = 9.41$, $p < .05$) between the other four subdimensions and the job characteristics. One job characteristic for which this pattern was not true was job feedback; its correlation with supervision satisfaction (.51) was stronger than its correlation with work satisfaction (.40). This finding is quite reasonable in light of the fact that feedback is typically provided by supervisors or managers in addition to arising from the work itself. Supervisors may therefore be seen (attributed) as a major and personal source of job feedback, thereby triggering a stronger response (cf. Ilgen, Fisher, & Taylor, 1979).

Although P. C. Smith et al. (1969) did not discuss moderators of the relationship between job characteristics and job satisfaction, Hackman and Oldham (1980) proposed three potential moderators. It is interesting that the present results revealed that only 2 of 30 correlations (7%) were moderated. This result is inconsistent with those reported by Loher, Noe, Moeller, and Fitzgerald (1985) and Podsakoff, MacKenzie, and Bommer (1996), who found that relationships between job characteristics and overall job satisfaction were moderated. The difference may lie in the varying techniques used to assess moderation or in the fact that both Loher et al. and Podsakoff et al. examined the relationship between job characteristics and overall job satisfaction.

Role states. Two role description variables, role conflict and role ambiguity, were included in the meta-analysis. These variables describe negative work states, so they should be negatively correlated with job satisfaction (Katz & Kahn, 1978; Netemeyer, Johnston, & Burton, 1990). This prediction was supported by results shown in Table 2. For role conflict, the corrected correlations ranged from −.29 for the Pay subscale to −.43 for the Work subscale, and the average corrected correlation across the five JDI subscales was −.35. For role ambiguity, the average corrected correlation across the JDI dimensions was −.32. Confidence intervals indicated that all corrected correlations differed significantly from zero ($p < .05$), and credibility

Table 4
Meta-Analytic Results for the Presumed Consequences of Job Satisfaction by Job Descriptive Index Subdimension

	Pay				Promotion				Coworkers				Work				Supervision			
Presumed consequence	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c	*K*	*N*	*r*	r_c
Motivation and citizenship behaviors																				
Motivation	8	1,739	.07	.09[a,b]	4	1,267	.22	.27[a]	7	1,732	.20	.24[a,b]	9	2,237	.35	.44[a]	8	2,307	.22	.27[a,b]
Citizenship behaviors	2	154	.21	.23[a]					2	154	.21	.23[a]	2	154	.14	.16[a]	2	154	.41	.45[a]
Withdrawal cognitions																				
Prewithdrawal cognitions	3	1,344	−.31	−.42[a]	2	1,249	−.27	−.33[a]	2	1,249	−.24	−.29[a]	5	1,871	−.43	−.53[a]	5	1,754	−.30	−.37[a]
Intention to leave	2	137	−.23	−.29[a]	4	1,371	−.28	−.35[a]	12	3,990	−.21	−.26[a]	16	4,836	−.40	−.50[a]	11	3,826	−.25	−.31[a]
Withdrawal behaviors																				
Absenteeism	5	438	−.09	−.11[a]	5	416	−.12	−.14[a]	5	428	−.08	−.09	6	534	−.12	−.14[a]	3	265	.01	.02
Turnover	4	388	−.12	−.14[a]	6	822	−.15	−.16[a]	5	625	−.17	−.18[a]	13	3,205	−.24	−.27[a]	8	2,241	−.12	−.14
				−.19[a,c]				−.17[a,c]				−.20[a,c]				−.30[a,c]				−.17[a,c]
Lateness	4	322	−.16	−.20[a]	4	300	−.17	−.20[a]	4	312	−.06	−.07[b]	4	300	−.18	−.22[a]	2	149	−.16	−.18[a]
Total days of sick leave	2	239	−.04	−.05	2	217	−.05	−.06	2	229	−.06	−.07	4	1,495	−.13	−.16[a]	2	230	−.06	−.07
Job performance																				
Subjective: Supervisory	7	2,580	.13	.15[a]	7	2,189	.16	.18[a]	8	2,041	.17	.20[a]	16	4,936	.16	.18[a,b]	16	5,031	.21	.23[a]
Subjective: Self													6	657	.22	.27[a,b]	4	590	.11	.13[a]
Objective: Hard criteria													6	362	.21	.24[a]				
Objective: Promotions													3	495	.20	.27[a]				

Note. *K* = number of samples in each analysis; *N* = total number of individuals in the *K* samples; *r* = uncorrected weighted average correlation; r_c = weighted average correlation corrected for unreliability.
[a] The 95% confidence interval does not include zero. (The actual confidence interval formula used is dependent on the credibility moderator.) [b] Credibility moderation indicates probable moderation ($p \leq .05$). [c] Weighted average correlation corrected for both unreliability and distributional properties.

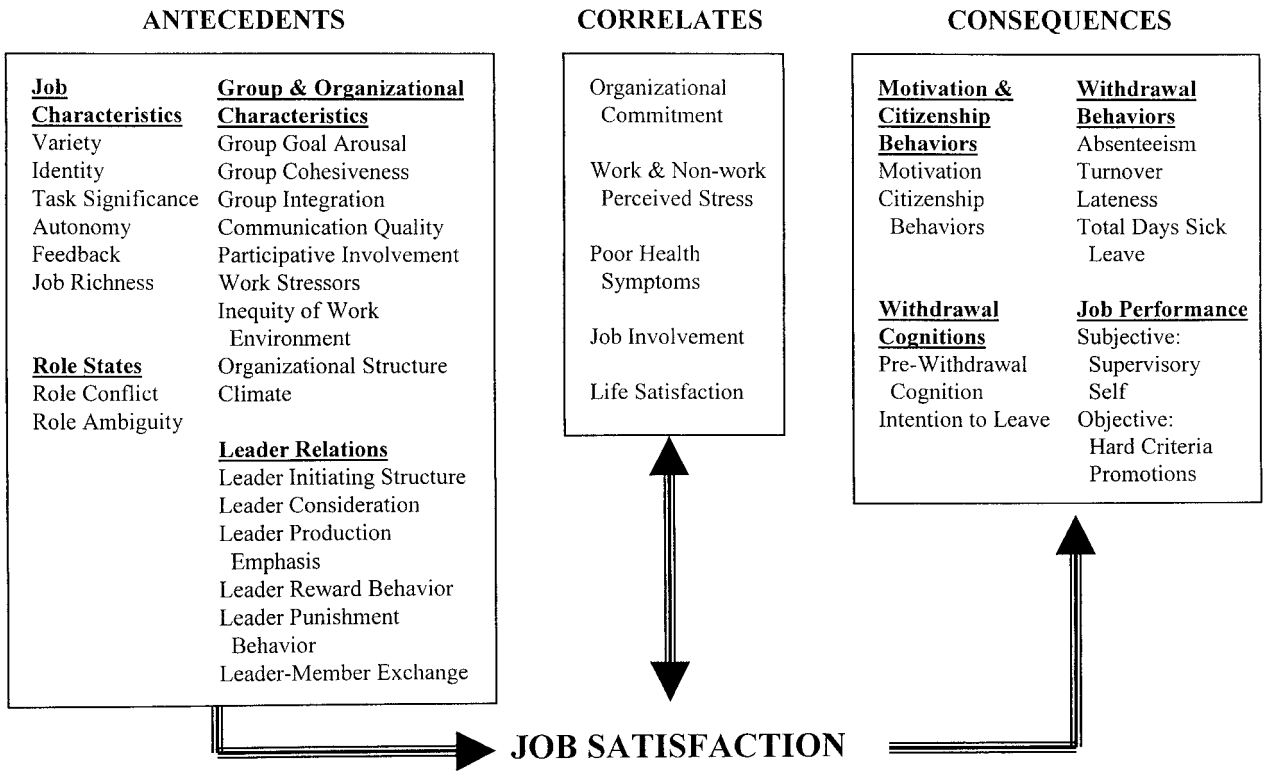

Figure 1. Classification of presumed antecedents, correlates, and consequences of job satisfaction.

intervals demonstrated that the relationships were not further moderated. These results are consistent with three previous meta-analytic studies on the presumed antecedents of role conflict and ambiguity (see Brown & Peterson, 1993; Fisher & Gitelson, 1983; and Jackson & Schuler, 1985).

Group and organizational characteristics. Nine different group and organizational characteristics were included in the meta-analysis (see Figure 1). We used models of group behavior to derive hypotheses about the relationship between the JDI and these variables. Models of group behavior (e.g., Gladstein, 1984; Hackman, 1987; Sundstrom, De Meuse, & Futrell, 1990) generally include job satisfaction as an indicator of group effectiveness. The flow of these models reflects the premise that group effectiveness is a process in which organizational contextual variables (e.g., organizational structure) affect group process variables (e.g., group cohesiveness), which in turn directly influence effectiveness criteria such as job satisfaction (Bettenhausen, 1991; Goodman, Ravlin, & Schminke, 1987; Sundstrom et al., 1990). Moreover, group synergy (Hackman, 1987), material resources (Hackman, 1987), group tasks (Gladstein, 1984; Mitchell & Silver, 1990), and technology (Bettenhausen, 1991; David, Pearce, & Randolph, 1989; Goodman et al., 1987) are hypothesized to moderate these relationships. These group models lead to three postulated patterns of relationships.

First, it seemed reasonable to expect those JDI subdimensions that are components of group dynamics or processes (i.e., coworkers, work, and supervision) to correlate more strongly with variables pertaining to group and organizational characteristics than the JDI Pay and Promotion subscales. Second, the group process variables (i.e., group goal arousal, group cohesiveness, communication quality, participative involvement, and climate) should be positively correlated with the JDI facet measures and should be of greater magnitude than the correlations between group context variables (i.e., group integration, work stressors, inequity of work environment, and organizational structure) and the JDI subdimensions. Larger correlations were expected for group process variables than for context variables because process variables were predicted to be direct antecedents of group effectiveness, whereas group context variables are exogenous within models of group behavior (Gladstein, 1984; Sundstrom et al., 1990). Finally, relationships between group and organizational characteristics and job satisfaction were expected to be moderated by other variables.

Results shown in Table 2 supported these predictions. The average corrected correlations between satisfaction with coworkers, work, and supervision and the different antecedents were .25, .31, and .31, respectively. In contrast, the average corrected correlations were .20 and .25 between pay and promotion satisfaction and the presumed antecedents, respectively. Additional analysis indicated that the average of the corrected correlations between the presumed antecedents and coworker, work, and supervision satisfaction (.29) was significantly greater than that between the antecedents and pay and promotion satisfaction (.23; $z = 2.45$, $p < .05$). It also is interesting to note that the corrected correlation between pay satisfaction and inequity of the work environment ($r_c = -.52$) was consistent with models of pay satisfaction (see Miceli & Lane, 1991).

Results also revealed that the average corrected correlation between the JDI subscales and the group process antecedents of group goal arousal, group cohesiveness, communication quality, participative involvement, and climate was .29, with all correla-

tions positive and significant. In contrast, the average corrected correlation was .23 between the group context variables and the JDI subdimensions; all correlations were significant. As we predicted, the average correlation for the group process presumed antecedents and the JDI was significantly larger than that for group context variables and the JDI ($z = 2.37$, $p < .05$). Table 2 further reveals that 25% (9 out of 36) of the correlations between group and organizational characteristics and JDI facets were moderated, providing partial support for models of group effectiveness.

Leader relations. P. C. Smith et al. (1969) theorized that leadership style is a precursor of job satisfaction, although the nature of this hypothesized relationship was not specified. Nonetheless, two predictions are clearly appropriate. First, correlations between supervision satisfaction and the presumed antecedents should be higher than those for the other JDI dimensions. Second, correlations between the Supervision subscale and the more interpersonal correlate categories of consideration, leader reward behavior, leader punishment behavior, and leader–member exchange, should be greater than those between the remaining correlate categories and satisfaction with supervision (cf. B. M. Bass, 1990; House & Shamir, 1993). This hypothesis is based on the fact that the JDI Supervision subscale measures satisfaction with predominantly interpersonally oriented behaviors or attributes exhibited by an individual's supervisor or manager.

Results shown in Table 2 are consistent with these predictions. Overall, the average corrected correlation between supervision satisfaction and the leadership presumed antecedents was .55, and all correlations possessed confidence intervals that significantly varied from zero ($p < .05$). In contrast, only 13 of the 23 remaining correlations were significant, and the average corrected correlation was .18 between the remaining JDI dimensions and the presumed antecedents. As we predicted, the .37 difference between these two sets of corrected correlations was significant ($z = 14.18$, $p < .05$). Furthermore, the .71 average corrected correlation between supervision satisfaction and the interpersonally oriented correlate categories (consideration, reward behavior, punishment behavior [reverse scored], and leader–member exchange) was significantly greater than the .25 average corrected correlation for the remaining presumed antecedents ($z = 19.88$, $p < .05$). These results are consistent with previous meta-analyses conducted by Gerstner and Day (1997) and Mullen, Symons, Hu, and Salas (1989).

Summary. Overall, the pattern of relationships between presumed antecedents of job satisfaction and the JDI was consistent with our predictions. Moreover, the results supported propositions derived from Hackman and Oldham's (1980) job characteristics model; Bedeian and Armenakis's (1981) model of role conflict and role ambiguity; components of various models of group behavior (e.g., Gladstein, 1984; Sundstrom et al., 1990); the leader–member exchange model of leadership (see Gerstner & Day, 1997); and Podsakoff, Todor, and Skov's (1982) model of leader reward behavior.

Correlates of Job Satisfaction

Organizational commitment. Although there is controversy about the direction of the relationship between job satisfaction and organizational commitment (cf. Davy, Kinicki, & Scheck, 1997; Farkas & Tetrick, 1989; Mathieu & Farr, 1991), past theory suggests that there should be positive correlations between the JDI subdimensions and organizational commitment (Brief, 1998; Spector, 1997). Results presented in Table 3 met this expectation. All five JDI subscales obtained positive and significant correlations with organizational commitment. None of these relationships were moderated, and the average JDI corrected correlation was .44.

Work and nonwork perceived stress. Models of organizational stress (e.g., Kahn & Byosiere, 1991; Matteson & Ivancevich, 1979) are generally based on the notion that perceptions of stressors are indirectly related to outcomes like job satisfaction through several mediating processes. Because stressors consist of a multifaceted set of environmental factors that produce stress, we predicted that each JDI subdimension would be related to perceived stress. Results presented in Table 3 supported this prediction. All five corrected correlations were significant, the average correlation across the five facets was $-.25$, and none of the relationships were moderated.

Poor health symptoms. A substantial body of research has demonstrated that negative affective states are associated with the symptoms and onset of infectious diseases (Cohen & Williamson, 1991). This research led to the prediction that the JDI subdimensions would be negatively related to poor health symptoms. The results presented in Table 3 confirmed this expectation in that coworker, work, and supervision satisfaction were all significantly negatively related to poor health symptoms. The lack of moderated relationships also is consistent with Cohen and Williamson's model.

Job involvement. Job involvement represents the extent to which an individual is personally involved with his or her work role. There were two predictions regarding this correlate. First, job involvement would be positively related to each facet of job satisfaction. Second, work satisfaction would be more highly related to job involvement than the other facets (because it assesses satisfaction with work activities or tasks). Results sustained both predictions (see Table 3). More specifically, the average corrected correlation between pay, promotion, coworker, and supervision satisfaction and job involvement ($r_c = .22$) was significantly lower than that between work satisfaction and job involvement ($r_c = .42$; $z = 10.94$, $p < .05$).

Life satisfaction. The JDI subdimensions were predicted to obtain positive relationships with life satisfaction on the basis of models of subjective well-being. Subjective well-being is composed of people's domain satisfactions (e.g., job or work satisfaction) and global judgments of life satisfaction, and domain satisfactions were expected to be positively related to overall life satisfaction (Deiner, Suh, Lucas, & Smith, 1999). The significant positive effects reported in Table 3 supported this expectation.

Summary. The pattern of relationships involving correlates of job satisfaction supported predictions derived from the JDI's nomological network. It also is interesting to note that JDI work satisfaction had a .35 average corrected correlation with these correlates, whereas the average was .26 for the remaining four JDI subscales. Finally, results supported propositions derived from models of stress (e.g., Kahn & Byosiere, 1991; Matteson & Ivancevich, 1979), infectious disease (Cohen & Williamson, 1991), and subjective well-being (Deiner et al., 1999).

Presumed Consequences of Job Satisfaction

Motivation. Motivation was predicted to positively correlate with the JDI because job satisfaction was expected to indirectly

affect employee behavior and performance through intentions or effort (P. C. Smith & Cranny, 1968). Results shown in Table 4 confirmed this prediction. The average corrected correlation between motivation and the JDI subscales was .26, and all correlations were significant. Moderated relationships between pay, coworker, and supervision satisfaction and motivation also were consistent with expectancy theory, which suggests that abilities, traits, and role perceptions are likely moderators of these relationships (Porter & Lawler, 1968). The pattern of correlations also reinforced Hackman and Oldham's (1980) proposition that intrinsic motivation is more strongly related to work satisfaction (r_c = .44) than to extrinsic factors such as satisfaction with pay (r_c = .09) and promotions (r_c = .27).

Citizenship behaviors. Organ (1988) defined organization citizenship behavior as "behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization" (p. 4). Citizenship behaviors were predicted to be positively related to overall job satisfaction and its specific facets (Van Dyne, Cummings, & McLean Parks, 1995). This prediction is supported by considering the present results along with Organ and Ryan's (1995) meta-analysis. Table 4 shows that pay, coworker, work, and supervision satisfaction had significant positive correlations with citizenship behaviors. Organ and Ryan's meta-analysis of 28 studies obtained significant uncorrected weighted average correlations of .24 and .22 between the citizenship dimensions of altruism and compliance and overall job satisfaction, respectively. Finally, the lack of moderated relationships is consistent with Van Dyne et al.'s model of extrarole behaviors.

Withdrawal cognitions. Traditional thinking asserts that job dissatisfaction leads to a variety of turnover cognitions, which in turn prompt intentions to leave and subsequent turnover (for a thorough review of turnover models, see Hom & Griffeth, 1995). This conceptualization led to the prediction that the JDI would be negatively related to both prewithdrawal cognitions and intention to leave. Table 4 reveals that all five JDI subscales were significantly and negatively related to prewithdrawal cognitions and intention to leave and that none of the relationships were moderated. The average corrected correlation was −.37 across the five JDI facets and both prewithdrawal cognitions and intention to leave.

Withdrawal behaviors. Two additional technical issues were addressed in conducting the meta-analysis for withdrawal behaviors: correction for unequal sample proportions caused by turnover base rates and dichotomization of turnover and absenteeism. Steel, Shane, and Griffeth (1990) and A. R. Bass and Ager (1991) argued that the unequal proportion of stayers and leavers artifactually influences correlations with turnover. In contrast, other researchers (e.g., Mitra, Jenkins, & Gupta, 1992; Williams, 1990; Williams & Livingstone, 1994) have argued that unequal turnover rates are based on nonartifactual situational differences in organizations and that correcting turnover correlations for these effects is therefore unwarranted. We thus report both corrected and uncorrected correlations. Further correction for dichotomization of a continuous variable has been suggested by Steel et al., noting that dichotomization leads to an underestimation of correlations. However, we concur with Williams (1990) and others (Mitra et al., 1992; Williams & Livingstone, 1994), who have argued that the turnover construct is not conceptually continuous but rather is a true dichotomy (we thus did not correct for dichotomization). Absenteeism is often similarly corrected for dichotomization (Mitra et al., 1992), but we did not need to even consider corrections because all of the studies in our analysis used continuous absenteeism measures.

JDI theory (see P. C. Smith & Cranny, 1968; P. C. Smith et al., 1969) and turnover models (see Hom & Griffeth, 1995) offer two clear predictions about the relationship between job satisfaction and the four withdrawal behaviors shown in Table 4. First, the JDI subscales are expected to be negatively related to absenteeism, turnover, and lateness. (Predictions regarding total days of sick leave are tenuous because this behavior is not completely under an employee's control, and thus it does not clearly constitute a mechanism to reduce work-role inclusion [Hulin, 1991].) Findings presented in Table 4 supported this hypothesis. Eighty percent (12 out of 15) of the corrected correlations between the JDI subscales and absenteeism, turnover, and lateness were negative and significant, and only the relationship between coworker satisfaction and lateness was moderated. The pattern of results also demonstrated that the JDI subscales were more strongly related to turnover and lateness than to absenteeism and total days of sick leave. The average corrected correlations across the JDI subscales and these presumed consequences were as follows: for turnover, r_c = −.18 and −.21; for lateness, r_c = −.17; for absenteeism, r_c = −.10; and for total days of sick leave, r_c = −.08.

The second hypothesis was that the JDI subscales would be more highly related to work attitudes (e.g., organizational commitment and job involvement) and withdrawal cognitions than to absenteeism, turnover, and lateness. This difference is because satisfaction was predicted to indirectly affect employee behavior through intentions and effort (P. C. Smith & Cranny, 1968; P. C. Smith et al., 1969). Results sustained this hypothesis. The average corrected correlation across the JDI subdimensions and organizational commitment and job involvement (r_c = .35) was significantly greater than the average corrected correlation across the JDI subdimensions and absenteeism, turnover, and lateness (r_c = −.15; z = 5.29, $p < .05$). In a similar manner, the average corrected correlation across the JDI subscales and the two withdrawal cognitions (prewithdrawal cognitions and intention to leave; r_c = −.37) was significantly greater than the average corrected correlation across absenteeism, turnover, and lateness (r_c = −.15; z = 5.49, $p < .05$).

Job performance. P. C. Smith et al.'s (1969) proposition that satisfaction indirectly affects performance through behavioral intention or effort led to two predictions about the JDI and performance. First, the JDI was expected to be only slightly correlated with performance measures. Results (see Table 4) were consistent with this hypothesis. The JDI subscales were significantly related to supervisory ratings, self-ratings, hard criteria of performance, and promotions. The average corrected correlations across JDI subdimensions and supervisory ratings[3] (r_c = .19) and self-ratings

[3] In addition to correcting correlations between supervisory ratings of performance and the JDI subdimensions for internal consistency reliability, we also corrected these correlations for interrater reliability as suggested by Viswesvaran, Ones, and Schmidt (1996). In the first analysis, we used the mean reliability reported in all other studies as an estimate of internal consistency reliability (M = .92). The second analysis corrected for interrater reliability. When interrater reliabilities were not given, we assumed a reliability of .52 (Viswesvaran et al., 1996). Correlations were higher when interrater reliabilities were used than when measures of internal consistency were used. The pattern of significance and moderation, however, was identical.

(r_c = .20) were similar to previous meta-analytic results obtained by Petty, McGee, and Cavender (1984; overall satisfaction–performance r = .22); Iaffaldano and Muchinsky (1985; r = .15); and Brown and Peterson (1993; r = .15). In contrast, the present results indicated only one moderated relationship between work satisfaction and supervisory ratings, whereas Petty et al.'s results revealed that all five JDI facet–performance correlations were moderated. It also is interesting to note that the corrected correlations between work satisfaction and hard criteria (r_c = .24) and promotions (r_c = .27) were higher than those between the JDI and supervisory ratings and self-ratings. This finding is very supportive of the JDI's construct validity because these performance measures do not share any common method variance with the JDI.

The second hypothesis predicted that the indirect relationship between job satisfaction and performance would be expected to result in larger correlations between the JDI and subjective measures of motivation than between the JDI and measures of performance. The significant difference between the average corrected correlation across the JDI subscales and motivation (see Table 4; r_c = .26) and supervisory, self-, and hard criteria measures of performance (r_c = .20; z = 2.07, $p < .05$) supported this prediction.

Summary. Overall, the pattern of correlations between presumed consequences of job satisfaction and the JDI was consistent with predictions derived from the JDI's nomological network. Results also demonstrated that satisfaction with work obtained the strongest correlations with this set of presumed consequences. The average corrected correlation between work satisfaction and withdrawal cognitions (−.53), withdrawal behaviors (−.20), and job performance (.24) exceeded the average corrected correlations between the remaining JDI subdimensions and withdrawal cognitions (−.33), withdrawal behavior (−.12), and job performance (.18). Finally, the results supported propositions derived from several turnover models (see Hom & Griffeth, 1995) and Katzell, Thompson, and Guzzo's (1992) model of job satisfaction and performance.

Convergent and Discriminant Validity

This section examines the extent to which scores obtained on the JDI are related to scores from other instruments purported to measure the same constructs (convergent validity) and the extent to which they are not related to measures of different constructs (discriminant validity).

Previous research. Buckley, Carraher, and Cote (1992) examined the convergent and discriminant validity of the JDI by performing confirmatory factor analyses on the multitrait–multimethod (MTMM) matrices of 12 samples. Across the 11 samples that had acceptable fit statistics, Buckley et al. found that the JDI contained 42.8% trait (construct) variance, 24.6% method variance, and 32.6% error variance. On the basis of their results, Buckley et al. (1992) concluded that "the JDI possesses only a moderate degree of trait validity" (p. 539) and that "random and systematic measurement errors may pose a problem for the JDI" (p. 537).

Although Buckley et al. (1992) based their conclusions on a generally rigorous and appropriate method for analyzing MTMM data, serious concerns may be raised about including most of the studies they examined. A number of the "multiple methods" that were used appeared to be extremely similar, such as S. M. Johnson et al.'s (1982) study, which used the standard JDI response format and a Likert scale format as different methods. In a similar manner, a number of the instruments correlated with the JDI were not carefully developed or did not necessarily measure the same conceptualization of the job satisfaction construct. When these concerns are coupled with the fact that parameter estimates based on only one sample may be subject to serious second-order sampling error, it would seem to make more sense to conduct a confirmatory factor analysis on a meta-analytically derived MTMM matrix containing parameter estimates (sample-weighted average correlations) that are based on more than one sample. Furthermore, such an analysis should include only measures that are reasonably sound and that assess the same theoretical constructs as does the JDI. Given these concerns, a supplemental literature search was undertaken to develop such a meta-analytic MTMM matrix for the present investigation.

Development of a meta-analytic MTMM matrix. Earlier narrative reviews on the JDI (e.g., Cook et al., 1981; Price & Mueller, 1986) were consulted, along with the list of studies presented in Buckley et al. (1992). A large number of potential studies were located. Nonetheless, most studies investigating JDI convergence and/or discrimination used only overall or global satisfaction measures, single-item or ad hoc measures, or measures used in only one sample (e.g., Herman, Dunham, & Hulin, 1975; McNichols, Stahl, & Manley, 1978; Mobley, Horner, & Hollingsworth, 1978; Newman, 1974; O'Reilly, Bretton, & Roberts, 1974; O'Reilly & Roberts, 1973; Ronen, 1977, 1978; P. C. Smith et al., 1969; Wexley, Alexander, Greenawalt, & Couch, 1980). Overall or global satisfaction measure studies were omitted because, as noted by Scarpello and Campbell (1983), these measures assess more than the sum of facet satisfactions, so that only modest convergence between the JDI subscales and global satisfaction measures would be expected. Furthermore, we omitted unreplicated studies and those that used single-item or ad hoc measures because of concerns about both measurement unreliability and second-order sampling error. The search and selection process summarized above produced two samples in which JDI–Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, England, & Lofquist, 1967) convergent validity coefficients were reported (Dunham, Smith, & Blackburn, 1977; Gillet & Schwab, 1975) and three samples that examined convergence between the JDI and the Index of Organizational Reactions (IOR; Dunham et al., 1977; McCabe et al., 1980; F. J. Smith, 1976). These studies were used in computing the present meta-analytic convergent validity estimates. Although it clearly would be desirable to base such estimates on a larger number of studies, the MSQ and the IOR are sound multi-item measures (with good internal reliabilities) and appear to use conceptualizations of the job satisfaction construct similar to those underlying the JDI. Also, the one study reporting both JDI–MSQ and JDI–IOR convergent validities (Dunham et al., 1977) was based on a reasonably large sample (N = 622), and the authors tested the representativeness of their sample's correlations against multiple subsamples drawn from the same organization (totaling 12,318 respondents) and found very high levels of convergence (R. B. Dunham, personal communication, August 18, 1988).

Data from the 5 uncovered JDI–MSQ and JDI–IOR convergent validity studies were next combined with the meta-analytic information already obtained on JDI subscale intercorrelations. Here, there were a large number of studies (from a low of 43 to a high of 57 studies per correlation), providing an excellent portrait of JDI

subscale covariance. To supplement the picture on MSQ subscale intercorrelations, data were added from 14 samples with 100 or more respondents that were reported in Weiss et al. (1967); this process yielded sample-weighted correlations based on a total sample size of 3,983. To also decrease error in IOR subscale intercorrelation estimates, data from studies by Hom, Katerberg, and Hulin (1979) and Dunham et al. (1977) were added, as were unpublished data from R. B. Dunham (personal communication, August 18, 1988), which yielded IOR subscale intercorrelations based on sample sizes ranging from 13,757 to 14,834 across 4 to 6 samples.

MTMM confirmatory factor analyses. The meta-analytically derived MTMM matrix is presented in Table 5. Tabular entries are sample-size-weighted mean correlations, obtained by the procedures described above; the numbers in parentheses are the number of samples on which the mean correlations were based. We used LISREL 8 maximum-likelihood confirmatory factor analysis (Jöreskog & Sörbom, 1993) and the procedures outlined by Widaman (1985) and recommended by Schmitt and Stults (1986). A full matrix model (Model 3C in Widaman's [1985] taxonomy) was first fit to the MTMM correlation matrix, using Rindskopf's (1983) parameterization technique (cf. Widaman, 1985, pp. 10–11). This full model consisted of three independent sets of factors: traits (constructs), methods, and uniqueness (errors); each JDI, MSQ, and IOR subscale was specified as having a loading on one trait, one method, and one unique factor, with no inappropriate cross-loadings (see Table 6). Following convention, the trait factors were allowed to be correlated with each other but not with the method or unique factors, and the methods were allowed to be correlated only among themselves. The unique factors were uncorrelated among themselves or with any other factors. Because of the large sample size (set at $N = 622$, which was for the smallest number of respondents underlying a correlation in Table 5; cf. Jöreskog & Sörbom, 1993), the goodness of fit of this full model to the data was not assessed by the significance of the model's chi-square but by the ratio of the chi-square to the degrees of freedom (Hoetler, 1983) and by Bentler and Bonett's (1980) rho and delta indices (Medsker, Williams, & Holahan, 1994). Following convention (e.g., Schmitt & Stults, 1986; Widaman, 1985), the full model was considered acceptable if both indices were .90 or greater and the chi-square ratio was reasonably close to 2.00.

To test for convergent and discriminant validity and method bias effects, four nested models were evaluated. The full model described above was first compared with a model with only method and unique factors (no trait factors—Widaman's [1985] Model 1C) and was used to assess the lack of convergent validity. The second rival model (Model 2C) was identical to the initial full model except that all trait intercorrelations were constrained to equal 1.00; this model was used to assess the lack of discriminant validity. Finally, the third rival model (Model 3A) included no method factors and was used to assess the presence of method bias effects. Following Widaman (1985), differences of .01 or greater in rho or delta between nested models were considered to indicate that a rival model provided a more meaningful fit to the data than did the initial model.

Results. Table 6 presents the LISREL-estimated full-model results, whereas Table 7 presents the analyses comparing this model with the three nested alternative models. As shown in Tables 6 and 7, the analysis indicated an excellent fit of the initial full model to the data (χ^2 ratio = 2.97, $\rho = .96$, $\delta = .97$), and

Table 5
JDI, MSQ, and IOR Meta-Analytic Multitrait–Multimethod Matrix

Instrument and subscale	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. JDI Pay	—													
2. JDI Promotion	.32	—												
	(43)													
3. JDI Coworkers	.24	.26	—											
	(47)	(45)												
4. JDI Work	.27	.29	.37	—										
	(47)	(49)	(52)											
5. JDI Supervision	.25	.29	.31	.30	—									
	(43)	(45)	(52)	(57)										
6. MSQ Compensation	**.57**	.33	.23	.31	.21	—								
	(2)	(2)	(2)	(2)	(2)									
7. MSQ Advancement	.33	**.60**	.30	.35	.27	.47	—							
	(2)	(2)	(2)	(2)	(2)	(2)								
8. MSQ Coworkers	.13	.19	**.47**	.30	.23	.25	.27	—						
	(2)	(2)	(2)	(2)	(2)	(2)	(16)							
9. MSQ Supervisor–Human Relations	.18	.29	.33	.29	**.56**	.32	.45	.40	—					
	(2)	(2)	(2)	(2)	(2)	(2)	(16)	(16)						
10. IOR Financial	**.52**	.25	.34	.32	.18	**.70**	.45	.38	.30	—				
	(3)	(4)	(3)	(4)	(3)	(1)	(1)	(1)	(1)					
11. IOR Career	.23	**.44**	.41	.39	.27	.54	**.68**	.42	.49	.61	—			
	(3)	(3)	(3)	(3)	(3)	(1)	(1)	(1)	(1)	(5)				
12. IOR Coworkers	.19	.20	**.52**	.32	.29	.33	.39	**.61**	.45	.41	.47	—		
	(3)	(4)	(3)	(4)	(3)	(1)	(1)	(1)	(1)	(5)	(4)			
13. IOR Work–Kind	.19	.27	.35	**.56**	.22	.36	.44	.35	.38	.41	.55	.47	—	
	(3)	(3)	(3)	(3)	(3)	(1)	(1)	(1)	(1)	(5)	(5)	(4)		
14. IOR Supervision	.15	.27	.39	.38	**.49**	.34	.46	.41	**.71**	.32	.53	.48	.52	—
	(3)	(4)	(3)	(4)	(3)	(1)	(1)	(1)	(1)	(6)	(5)	(5)	(5)	

Note. The entries in parentheses are the number of samples on which each weighted correlation is based. Convergent validities are shown in boldface type. JDI = Job Descriptive Index; MSQ = Minnesota Satisfaction Questionnaire; IOR = Index of Organizational Reactions.

Table 6
LISREL 8 Confirmatory Factor Analysis Results

Instrument and subscale	Trait factors					Method factors			
	Pay	Promotion	Coworkers	Work	Supervision	JDI	MSQ	IOR	Error
Factor loading matrix									
JDI Pay	.78	.0*	.0*	.0*	.0*	.23	.0*	.0*	.59
JDI Promotion	.0*	.72	.0*	.0*	.0*	.24	.0*	.0*	.66
JDI Coworkers	.0*	.0*	.49	.0*	.0*	.60	.0*	.0*	.64
JDI Work	.0*	.0*	.0*	.62	.0*	.45	.0*	.0*	.65
JDI Supervision	.0*	.0*	.0*	.0*	.64	.29	.0*	.0*	.72
MSQ Compensation	.70	.0*	.0*	.0*	.0*	.0*	.51	.0*	.55
MSQ Advancement	.0*	.77	.0*	.0*	.0*	.0*	.44	.0*	.49
MSQ Coworkers	.0*	.0*	.57	.0*	.0*	.0*	.44	.0*	.69
MSQ Supervision	.0*	.0*	.0*	.0*	.78	.0*	.41	.0*	.50
IOR Financial	.59	.0*	.0*	.0*	.0*	.0*	.0*	.65	.52
IOR Career	.0*	.46	.0*	.0*	.0*	.0*	.0*	.82	.38
IOR Coworkers	.0*	.0*	.71	.0*	.0*	.0*	.0*	.48	.53
IOR Work–Kind	.0*	.0*	.0*	.63	.0*	.0*	.0*	.53	.57
IOR Supervision	.0*	.0*	.0*	.0*	.68	.0*	.0*	.50	.56
Matrix of factor intercorrelations									
Pay	—								
Promotion	.48	—							
Coworkers	.25	.31	—						
Work	.30	.45	.43	—					
Supervision	.23	.48	.51	.44	—				
JDI	.0*	.0*	.0*	.0*	.0*	—			
MSQ	.0*	.0*	.0*	.0*	.0*	.62	—		
IOR	.0*	.0*	.0*	.0*	.0*	.67	1.0*	—	

Note. An asterisk denotes a parameter fixed at the value shown; all nonfixed parameters are statistically significant at $p \leq .001$. JDI = Job Descriptive Index; MSQ = Minnesota Satisfaction Questionnaire; IOR = Index of Organizational Reactions.

meaningful convergent and discriminant validity and method bias effects were present (all ρ and δ differences were .08 or greater, and all χ^2 ratio differences were well in excess of 2.00). Furthermore, examination of the trait intercorrelations (see Table 6) did not suggest the need to eliminate or combine trait factors (i.e., to estimate models with fewer than five traits). Although the Fisher *z*-transformed average trait intercorrelation was .44, the range was from .23 to .51, indicating substantial unshared variance among the five latent satisfaction traits. These correlations are similar to those of Buckley et al. (1992), but they are even more supportive of the five underlying traits as separate and distinct (Buckley et al.'s [1992] mean intercorrelation was .48, with a range from .29 to .68).

Examination of the method factor intercorrelations (see Tables 6 and 7) showed that it was necessary in all of these analyses to constrain the MSQ–IOR method factor intercorrelation at 1.00 so as to obtain an admissible estimate. However, reanalyzing the data with only two method factors (one JDI and one combined MSQ–IOR) did not provide any better fit to the data, nor did it affect the parameter estimates of this analysis. These results, then, suggested that the original full model was an acceptable portrayal of the data, and the model shown in Table 6 was considered satisfactory.[4]

Averaging (with *z* transformations) and squaring the factor loadings shown in Table 6 (to examine variance attributable to trait, method, and unique factors) showed the following results (rounding error produced a few figures that sum to more than 100% variance). For the JDI, trait variance averaged 43%, whereas method variance accounted for 15% and error 42%. The ranges over subscales were considerable, with the Pay subscale showing 61% trait variance (5% method and 35% error) and the Coworkers subscale showing only 24% trait variance (36% method and 41% error).

These figures show the JDI to fare only moderately when compared with the MSQ and the IOR. The MSQ showed an average of 50% trait variance, 20% method variance, and 31% error, whereas the IOR averaged 38% trait variance, 37% method variance, and 26% error. These findings are similar to those of Buckley et al. (1992). The JDI trait variance estimate was virtually identical (43%), whereas the method variance estimate (15% vs. 25%) was a bit lower and the error variance estimate a bit higher (42% vs. 33%). Thus, although based on very different MTMM matrices, these results clearly support Buckley et al.'s (1992) concerns about the JDI. Although the data show the JDI to possess statistically significant convergent and discriminant validity, more than one half of its variance is method and error variance instead of trait variance. Compared with the IOR, the JDI has more valid (trait) variance, but it has less than the MSQ.

As perhaps a final point with respect to convergent and discriminant validity, it is important to note that although the JDI has demonstrated discriminant validity, this is not to say that its subscales are empirically uncorrelated. P. C. Smith et al. (1969)

[4] We should mention that the estimated unconstrained MSQ–IOR method correlation ranged from a low of 1.02 to a high of 1.04 throughout these analyses. Thus, it is not surprising that constraining it at 1.00 produced minimal effects on the other estimated parameters.

Table 7
Goodness-of-Fit Indices for Multitrait–Multimethod Confirmatory Analyses

Model	Indices of model fit				
	χ^2	*df*	χ^2/df	ρ	δ
Full model (Model 3C; see Table 6)[a]	151.34	51	2.97	.96	.97
No trait factors (Model 1C)[a]	1,586.01	75	21.15	.61	.67
Perfectly correlated traits (Model 2C)[a]	931.35	61	5.27	.73	.80
No method factors (Model 3A)[a]	531.64	67	7.93	.87	.89
	Comparative indices of model differences				
Difference in model comparison					
Convergent validity (Model 3C vs. Model 1C)	1,434.67	24	59.78	.35	.30
Discriminant validity (Model 3C vs. Model 2C)	780.01	10	78.00	.23	.17
Method bias (Model 3C vs. Model 3A)	380.30	16	23.77	.09	.08

Note. Rho is an indicator of relative model fit (relative to degrees of freedom), whereas delta is an absolute measure (Bentler & Bonett, 1980).
[a] For this analysis, the correlation between the Minnesota Satisfaction Questionnaire and Index of Organizational Reactions methods was constrained at 1.00 (see the *Results* section of the text for details).

proposed that the subdimensions should be discriminably different yet not orthogonal. Their rationale was based on the belief that intercorrelations among dimensions of satisfaction are dependent on the characteristics of jobs, characteristics of workers, and questionnaires used to measure satisfaction (P. C. Smith et al., 1969, p. 27). Actual job characteristics, for instance, are likely to improve together with job level. Furthermore, an individual's extreme satisfaction or dissatisfaction with one satisfaction facet may spill over and bias evaluations of other facets (P. C. Smith et al., 1969). Thus, moderate correlations among the JDI subdimensions were expected. The results shown in Table 5 support this interpretation. JDI intercorrelations ranged from .24 to .37, with a *z*-transformed average of .31. In conclusion, JDI intercorrelations were reasonably consistent with P. C. Smith et al.'s underlying theory, providing some additional support for the construct validity of the JDI.

Summary and Recommendations for Future Research

The construct validity of the JDI was supported by results pertaining to reliability. Internal consistency reliability estimates for the JDI were moderately high, and test–retest reliability results supported the idea that job satisfaction is a dynamic state that is susceptible to change over time. Our evaluation of predictions derived from a nomological network of job satisfaction relationships also supported the JDI's construct validity. The JDI obtained many relationships predicted from the proposed network, and it possessed none that were contraindicative of construct validity.

These positive findings about the JDI's construct validity are tempered by the fact that many of these relationships are not markedly stronger than those reported in other meta-analyses that did not distinguish among satisfaction measures (cf. Fisher & Gitelson, 1983; Hackett & Guion, 1985; Iaffaldano & Muchinsky, 1985; Jackson & Schuler, 1985; Loher et al., 1985). There are two potential interpretations, however, for these overall findings. First, assuming the validity of the currently proposed network of relationships, these results indicate that the JDI, although adequate with respect to construct validity, may not be superior to the "average" satisfaction measure used in the field (it should be noted that the average typically includes a large proportion of JDI studies, thereby biasing this comparison against the JDI). A competing conclusion is drawn from the fact that previous meta-analyses included a variety of measures of satisfaction, including both overall and facet measures. The lower effect sizes obtained by our meta-analysis may stem from the fact that the JDI subscales are facet measures rather than overall measures of job satisfaction, and overall measures often obtain higher correlations. For example, Ironson, Smith, Brannick, Gibson, and Paul (1989) compared the JDI and the JIG and found that the overall measure (JIG) obtained higher correlations with other variables than did any of the facet measures 50% of the time. The JDI, then, should be evaluated against other instruments that provide facet measures of job satisfaction. Furthermore, the JDI subdimensions have demonstrated differential relations with the proposed correlates of satisfaction. Thus, the JDI is appropriate when facet measures are desired (P. C. Smith et al., 1969); however, it should not be used when an overall measure is theoretically necessary (Ironson et al., 1989).

Although the results with respect to the construct validity of the JDI are generally positive, the large amounts of method and error variance in the JDI are troublesome indeed, particularly for the Coworkers and Work subscales (these subscales showed only 24% and 38% trait variance, respectively; see Table 6). In fact, the confirmatory MTMM matrix analysis reported here, along with some of the findings of Buckley et al. (1992), suggest that the MSQ may be a better overall measure of pay, promotion, coworker, and supervision satisfaction than is the JDI. When this finding is coupled with the generally good internal consistency reliabilities of the MSQ's subscales and the evidence with respect to the MSQ's test–retest reliability (cf. Cook et al., 1981; Price & Mueller, 1986; Weiss et al., 1967), the JDI's overall performance appears to be good but not outstanding. Because a complete analysis of the MSQ has apparently not been undertaken, it would be premature to conclude that it is superior in any way to the JDI. Nonetheless, Scarpello and Campbell (1983) felt that "the MSQ appears to be the most researched [satisfaction] instrument currently available" (p. 585), so that conducting a formal assessment would seem highly desirable. Further research modeling the trait, method, and error variance of individual JDI subscale items would

also seem highly desirable, perhaps as a way of deleting poor items and improving the JDI's proportion of trait variance relative to method and error variance.

Although our results support the construct validity of the JDI, additional validation of the JDI's item content is needed. The JDI's mixture of evaluative and descriptive items raises theoretical concerns about content validity as well as concerns about the effects of spurious correlations. Whereas other satisfaction measures, such as the MSQ, may have similar difficulties (Ferratt, Dunham, & Pierce, 1981), the JDI's unique mixture of intentionally evaluative and descriptive items makes it a clear and obvious target for such concerns. Further theorization on P. C. Smith et al.'s (1969) evaluative–general–long-term versus descriptive–specific–short-term distinction seems needed, as does further empirical research in this domain.

There are pragmatic concerns that could be raised about use of the JDI. The issue of the JDI's breadth of domain sampling is an important one, with measures such as the MSQ providing the ability to study broader conceptualizations of job satisfaction. For example, although the MSQ does not contain an explicit work satisfaction subscale, it does have subscales that assess satisfaction with many aspects of the job (e.g., achievement, ability utilization, activity, creativity, independence, and variety; cf. Weiss et al., 1967). A related concern with the JDI involves its length. The JDI requires five pages of questionnaire space, and it has a large number of items (72) relative to its number of dimensions (five). This high item-to-dimension ratio is probably mandated by the fact that the JDI uses a 3-point response scale and that such scales typically produce smaller interitem correlations, necessitating a relatively large number of items per subscale to obtain a given reliability (Nunnally & Bernstein, 1994). In comparison, the MSQ appears to have better internal consistency reliabilities with only 5 items per dimension (subscale). These results suggest that further research on the format of the JDI (beyond that of S. M. Johnson et al., 1982) may be desirable, particularly if it can lead to shortening the JDI while maintaining or improving its other psychometric properties.

This investigation, in addition to assessing the construct validity of the JDI, contributes to the advancement of research in two areas, one theoretical and one methodological. As previously discussed, assessment of the JDI's construct validity was made more difficult by the lack of a well-developed theory of job satisfaction. Our research uncovered 487 variables with which job satisfaction was correlated. This large number of variables suggests that an "implicit theory" of job satisfaction is being used by organizational researchers and highlights two key issues concerning job satisfaction research. First, there is widespread usage of ad hoc scales. The psychometric properties of these ad hoc scales are largely unsubstantiated, which affects the validity of accumulated empirical findings and inhibits between-study comparisons. Second, the atheoretical inclusion of job satisfaction as related to a plethora of variables in a multitude of studies does little to explicate the construct of job satisfaction and may even impede attempts at theory development (you may recall that these two problems contributed to us dropping 39 correlates from the analyses; see Footnote 2). Given the importance of the job satisfaction construct (Locke, 1976; Staw, 1984), it is imperative that attention be given to developing a comprehensive theory of job satisfaction, or to testing propositions derived from existing theories. For example, Brief (1998) noted that research has not thoroughly examined the various frames of reference that implicitly underlie ratings obtained on the JDI. He concluded that "frames of reference might be conceived of at the occupational level and gauged by unemployment rate, proportion of full-time workers, wage levels, and the like" (Brief, 1998, p. 27). The taxonomy of relationships identified in this study and their associated relative strengths, coupled with Brief's (1998) discussion about a "new" job satisfaction construct, provide an excellent starting place for a comprehensive theory of job satisfaction.

The second "unique" contribution of this article is its illustration of a more sophisticated methodology for construct validity assessment than is typically used. Numerous authors and professional standards advocate the simultaneous consideration of all available evidence concerning a measure when construct validity is being evaluated (cf. Guion & Schriesheim, 1997); the technique of meta-analysis provides an excellent methodology to enable the examination of a large body of data concerning any given instrument.

In conclusion, the present review, critique, and analysis suggests that the JDI is a reasonable measure for researchers to use when satisfaction is investigated. However, other measures may be equally appropriate depending on the circumstances. It also is important to remember that the present results and conclusions are based mainly on studies using the original JDI. That said, our results also provide indirect support for the construct validity of the revised JDI because past research has shown that the original and the revised JDI are essentially equivalent (Balzer et al., 1995; Paul et al., 1990).

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