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Job Satisfaction and Job Performance: A Meta-Analysis

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Abstract

The assumption that job satisfaction and job performance are related has much intuitive appeal, despite the fact that reviewers of this literature have concluded there is no strong pervasive relation between these two variables. The present meta-analytic study demonstrates that (a) the best estimate of the true population correlation between satisfaction and performance is relatively low (.17); (b) much of the variability in results obtained in previous research has been due to the use of small sample sizes, whereas unreliable measurement of the satisfaction and performance constructs has contributed relatively little to this observed variability in correlations; and (c) nine research design characteristics of a study are only modestly related to the magnitude of the satisfaction-performance correlation that will be obtained. In view of these findings, some of the major substantive and research implications of the job satisfaction-job performance relation are discussed.

The elusive relation between job satisfaction and job performance has intrigued organizational researchers for nearly 50 years. In their classic review of the early literature in this area, Brayfield and Crockett (1955) credited Kornhauser and Sharp (1932) with the initial

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investigation of attitudes and productivity in an industrial setting. Although the flurry of research on this topic has abated somewhat in the past few years, the current literature continues to be highlighted with reports of new theoretical and empirical developments. Indeed, the *Journal of Vocational Behavior*'s yearly research review still references studies that relate job satisfaction to job performance (e.g., Bartol, 1981).

To keep pace with this ever-expanding volume of research, several summaries of the job satisfaction-job performance literature have appeared, both from an empirical perspective (Brayfield & Crockett, 1955; Herzberg, Mausner, Peterson, & Capwell, 1957; Srivastva et al., 1975; Vroom, 1964) and a theoretical orientation (Schwab & Cummings, 1970). These reviewers attempted to reconcile the inconsistencies among individual study results by concluding that there is no strong pervasive relation between workers' job satisfaction and productivity. Specifically, Vroom (1964) reported a median correlation of +.14 from the 20 studies he reviewed, and Brayfield and Crockett reported that there was insufficient evidence that employee attitudes "bear any simple ... or for that matter, appreciable ... relationship to performance on the job" (1955, p. 408). However, Herzberg et al. (1957) were somewhat more optimistic, and although the correlations they compiled were generally low, they concluded that further attention to satisfaction in relation to worker output was warranted.

Despite these generally negative conclusions by reviewers, investigations into the connection between these two variables proliferated along several lines. One area that received much attention was the question of causality between satisfaction and performance (cf. Lawler & Porter, 1967; Organ, 1977; Schwab & Cummings, 1970; Siegel & Bowen, 1971). Another area of concern has been the search for moderators of the satisfaction-performance relation, such as the contingency of rewards (Jacobs & Solomon, 1977; Lawler, 1973), situational constraints (Bhagat, 1982; Herman, 1973), self-esteem (Jacobs & Solomon, 1977; Lopez, 1982), pressures for production (Triandis, 1959), and reciprocity norms (Organ, 1977). A third line of research has focused on methodological/measurement techniques for increasing the magnitude of the satisfaction-performance relation obtained (Fisher, 1980; Jacobs & Solomon, 1977; Triandis, 1959).

One impetus behind researchers' proclivity for studying the satisfaction-performance relation appears to be the assumption that the two variables should be related, and that further research will reveal this as-yet-undiscovered truth. However, the new studies often served only to increase the existing data base in this area to the point where it is now highly fractionated. What appears to be needed is an integration of the already documented results into some descriptive yet quantitative form. The recent emergence of a new approach to research integration, meta-analysis, offers this possibility.

Glass (1976) proposed the term *meta-analysis* to refer to the "statistical analysis of a large collection of analysis results from individual studies, for the purpose of integrating the findings" (p. 3). He and his colleagues typically used and advocated a specific methodology that included quantifying an effect size for each study and then relating (via regression analysis) the magnitude of effect to various descriptive contextual characteristics of the studies to determine the causes of variation in study findings (e.g., Smith & Glass, 1977). In general, this form of meta-analysis has been used by several researchers to derive generalizations from the literature on a wide variety of topics. Glass, McGaw, and Smith (1981) and Hunter, Schmidt, and Jackson (1982) provided extensive bibliographies of meta-analytic investigations of this sort.

Concurrently with Glass's work on meta-analysis, Schmidt and Hunter and their colleagues developed an extensive set of procedures for demonstrating the generalizability of employment test validities (cf. Pearlman, Schmidt, & Hunter, 1980; Schmidt, Gast-Rosenberg, & Hunter, 1980; Schmidt & Hunter, 1977; Schmidt, Hunter, & Pearlman, 1981). They regarded their validity generalization method as an extension of Glassian meta-analysis, because both sets of procedures emphasized statistical integration by determining a mean effect size across studies. They cited the major conceptual difference between the two approaches as being the direct focus that validity generalization procedures place on the role of statistical artifacts in influencing the variance in observed effects across studies (Schmidt et al., 1980).

Although Schmidt and Hunter's validity generalization procedures were originally proposed in the context of personnel selection, the formulas have recently been developed into a general technique of meta-analysis, applicable to the integration of research in virtually

any domain (Hunter et al., 1982). The rationale behind the procedure remains the same, however, in that a large proportion (if not all) of the variation in findings across studies is assumed to be the result of seven statistical artifacts: (a) sampling error due to small sample sizes, (b) criterion unreliability, (c) predictor unreliability, (d) range restriction, (e) criterion contamination and deficiency, (f) slight differences in factor structure between different tests measuring similar constructs, and (g) computational and typographical errors (Schmidt & Hunter, 1977). Recent studies within several content domains demonstrated that Schmidt and Hunter's procedure, which corrects for just the first four of these artifacts, can explain a substantial amount of the variation found in effect sizes (Fisher & Gitelson, 1983; Linn, Harnisch, & Dunbar, 1981; Mabe & West, 1982; Terborg, Lee, Smith, Davis, & Turbin, 1982).

Aside from their specific results, Mabe and West's (1982) review demonstrated the complementary nature of the Glassian and Hunter et al. (1982) approaches to meta-analysis. Whereas Hunter et al.'s (1982) technique used a confirmatory perspective and attempted to assess the theoretical true relation between the variables in question, Glass et al.'s (1981) approach was more exploratory in nature, attempting to discern qualitative aspects of the studies themselves that can account for the obtained results. Although Hunter et al. criticized Glass's use of large numbers of coded characteristics as capitalizing on chance, they did acknowledge the use of the Glassian approach as a supplementary step to their own procedure when the estimated variance of effect sizes (i.e., after corrections for artifacts have been made) across studies is substantially greater than zero.

Present Study

The present study attempts to synthesize and integrate our existing knowledge of the job satisfaction-job performance literature by using the meta-analytic techniques of Hunter et al. (1982) and Glass et al. (1981). Although previous narrative reviews (Brayfield & Crockett, 1955; Herzberg et al., 1957; Vroom, 1964) drew some tentative conclusions regarding the nature of this relation, the statistical integration now available with these two forms of meta-analysis offers

the prospect of more exact conclusions regarding the true theoretical correlation between these two variables and a delineation of what types of study conditions moderate this relation in practice. Results of a meta-analytic review of the satisfaction-performance literature may demonstrate that the true magnitude of this relation is, substantially different from the low positive correlation that reviewers have found (e.g., Brayfield & Crockett, 1955; Herzberg et al., 1957; Vroom, 1964).

The characteristics selected for inclusion in coding were based on variables that have been identified theoretically or empirically as appearing to influence obtained correlations and were deemed to be feasible based upon pilot testing. Although variables such as situational constraints (Bhagat, 1982; Herman, 1973), pressure for production (Triandis, 1959), or degree of job fit (Schwab & Cummings, 1970) may contribute greatly to the variance in performance-satisfaction correlations across studies, information regarding such conditions is rarely provided, thus limiting the value of coding such variables. The resulting list of nine study characteristics to be included, therefore, represents a partial list of potential influences on the magnitude of the satisfaction-performance correlation obtained in a study.

Research Design Characteristics

Fisher (1980) discussed the importance of measurement issues in the failure to find consistent correlations between satisfaction and performance. She advocated a "fit" between the specificity of attitude and performance-criterion measures used to maximize the relation observed. On the basis of her suggestions, studies reviewed here were examined for the use of composite versus unidimensional criteria and longitudinal versus cross-sectional measurement of performance relative to the measurement of satisfaction. A third variable—the nature of the performance measure (i.e., whether quality or quantity of performance was assessed)—was expected to contribute to the variation in results across studies.

A fourth condition of interest was the potential difference in results obtained with self-reports of performance as opposed to other sources such as supervisory ratings. Although both types of subjective ratings have potential problems such as bias and distortion, Mabe

and West's (1982) review suggested that self-reports may be a more valid indicant of performance than has been generally acknowledged. A fifth variable concerned the use of a performance measure developed specifically for experimental use. Data obtained from a measure of this type might reasonably be expected to differ from information extracted from organizational archives. Finally, performance measures were coded on the basis of whether they were subjective (as ratings) or objective (as units of production), this characteristic being somewhat interrelated with (yet not totally dependent on) the quality-quantity distinction made earlier.

Two characteristics of the studies were coded pertaining to the job satisfaction measure used. First, the specificity of the satisfaction assessed was noted (i.e., specific facet satisfaction vs. global satisfaction), on the basis of Fisher's (1980) thesis that specific performance-appraisal information should correlate more highly with specific (rather than global) job satisfaction indexes. Second, the type of satisfaction measure used was assessed and recorded as being either a traditional, well-documented instrument such as the Job Descriptive Index (JDI; Smith, Kendall, & Hulin, 1969), the Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, England, & Lofquist, 1967), or the Faces Scale (Kunin, 1955), or conversely, as an instrument developed by the researcher specifically for the purposes of the particular study.

Finally, because there has been some note that the strength of the satisfaction-performance relation may vary across occupational groups (Lawler & Porter, 1967), the nature of the sample used in the study was coded as either white-collar/professional or blue-collar employee and constituted the ninth research design characteristic examined.

Although it was proposed that these nine characteristics would contribute significantly to the prediction of the size of correlation obtained in a study, no specific hypotheses regarding the magnitude of their contribution and the results of correction of the mean and variance of this distribution of satisfaction-performance correlations (via the Hunter et al. formulas) could be made.

Method

An extensive search of the published psychological literature was conducted to obtain as many job satisfaction-job performance correlations as possible for inclusion in the analysis. Although meta-analysis does not require a specified minimum number of studies, it was assumed that a more comprehensive review would result in more accurate estimates of the population parameters. It was anticipated that approximately 60 to 100 studies would be accessible, potentially containing a total of several hundred correlation coefficients. For example, Mabe and West (1982) obtained 55 published studies, yielding a total of 267 correlations between self-evaluations of ability and performance measures. The data-collection procedures for the present review identified 74 empirical studies published in 70 articles, with a subject sample size of 12,192, and providing a total of 217 satisfaction-performance correlations included in the meta-analysis.

Data-Collection Procedures

Several steps were taken to locate potential studies containing satisfaction-performance correlations. First, a computer search of the *Psychological Abstracts* (1967—April 1983) was made. Second, there was a manual search of all relevant published references cited by the following major reviews of the job-satisfaction literature: Brayfield and Crockett (1955); Herzberg et al. (1957), Vroom (1964), Schwab and Cummings (1970), Ronan (1970), and Locke (1976). Third, a complete search of relevant references cited by any of the previously located articles was made. Because additional sources that contained satisfaction-performance correlations embedded within the primary analyses might be obtained (i.e., the salience of a reported satisfaction-performance correlation was secondary to another focus of the study), a fourth data-collection step was undertaken. This involved a manual search of each issue of the major relevant academic journals through June, 1983 (e.g., *Journal of Vocational Behavior, Journal of Occupational Psychology, Academy of Management Journal, Journal of Applied Psychology*). Due to time constraints, this final issue-by-issue search did not include every potentially relevant academic journal, nor were early issues (prior to 1960) included in this phase of the

search. However, the journals and dates that were selected for inclusion were believed to be those having the highest probability of containing empirical research with embedded satisfaction-performance correlations, on the basis of the results of the earlier data-collection stages. At the conclusion of this final step, 74 studies had been identified in 70 published sources as providing usable information for the meta-analysis.

Selection bias in the studies published, and hence available for review, is a potentially limiting factor for any meta-analysis. However, due to the debate over the magnitude of this particular relation, there appears to have been a publication atmosphere more receptive to nonsignificant or negative findings (zero or negative correlations) than perhaps exists in other areas of psychological research. Thus, it was assumed here that satisfaction-performance correlations of any sign or magnitude have generally had equal chances of being published, thereby diminishing the potential for file drawer studies (Rosenthal, 1979) to drastically alter the results obtained using the present sample of correlations.[1]

Individual studies were selected for inclusion in the meta-analysis based on the following criteria: (a) the study results must be published research, thus excluding unpublished technical reports, doctoral dissertations, and so on, (b) the individual, rather than the group, must be used as the unit of analysis, (c) a product-moment correlation must be reported between some measure of job satisfaction and some performance measure (thus excluding studies using various types of need satisfaction, but including laboratory studies implementing task satisfaction- and task-performance measures), and (d) correlations must be taken from the highest level of aggregation when both subsample and total-sample correlations were reported in a study, as recommended by Pearlman et al. (1980) and Hunter et al. (1982). For example, if a study reported a correlation for the total sample and correlations for the sample moderated by race, sex,

1 As a check on this assumption, we applied Rosenthal's (1979) formula for calculating the number of zero effect sizes needed to invalidate the conclusions totally, based on the present set of studies. For the total sample there would have to be thousands of additional zero correlations between satisfaction and performance to invalidate the conclusions presented here. However, because the correlations in our sample are not completely independent, this estimate is inflated.

or self-esteem, only the total sample *r* was recorded. However, those studies using different samples of interest to the present study (e.g., blue collar and white collar) provided a separate *r* for each group. In addition, studies that did not provide the minimum necessary information to conduct the meta-analysis (the sample size, the computed correlation, and the specific nature of the satisfaction and performance measures) were rejected.

A performance measure was defined as any type of measure of productivity (objective or subjective). Studies often used performance measures based upon tardiness, absence, turnover, and union grievances; however, such correlations were excluded from this analysis in an effort to preserve the clarity of interpretations regarding the satisfaction-productivity relation. Separate meta-analyses of the relation between satisfaction and these other indicants are necessary and may yield conclusions highly disparate from those presented here.

The inclusion of several correlations from a single study does suggest a lack of independence in the data. This observation has been addressed by previous researchers (e.g., Smith & Glass, 1977; Mabe & West, 1982). Although it leads to some underestimation of the adjustment for sampling error, the prevailing assumption appears to be that considerable amounts of information would be lost if one were to average the often widely discrepant correlations within a study to obtain a single index per study. However, Hunter et al. (1982) asserted that if total-group correlations are not given, subgroup *r*s should be averaged, the average *r* being used in the meta-analysis with the total group sample size. Hunter et al. pointed out that this average *r* is usually smaller than the total group *r,* had it been reported.

In the present study, we attempted to achieve a balance between these two opposing orientations regarding the averaging of study correlations. To minimize the nonindependence of data, satisfaction-performance correlations within a study were averaged following the suggestion of Hunter et al. (1982), with the average value being used in the meta-analytic procedures. However, this averaging process was not used when it would serve to confound the appropriate codes for the nine study characteristics that would accompany that correlation. For example, Nathanson and Becker (1973) reported 23 satisfaction-performance correlations for the same sample of 57 physicians, moderated by several variables such as income, career goals, and type of

training received. These individual correlations did not vary in terms of the codes they would have received for the nine study characteristics and were based on various subgroups of the same subject sample. Thus, they were averaged to yield a single correlation, which was used in the present analysis. In contrast, studies such as Siegel and Bowen (1971), Sheridan and Slocum (1975), and Bhagat (1981) reported sets of both static and cross-lagged correlations between satisfaction and performance. Averaging across all correlations in these studies would have resulted in a confounding of the appropriate coding for the second study characteristic mentioned earlier (the use of longitudinal vs. cross-sectional measurement of performance relative to the measurement of satisfaction). Consequently, in such situations, an average static correlation and an average cross-lagged correlation were included in the meta-analysis, each with its separate set of nine coded study characteristics.

Similar averaging of correlations within other studies yielded the total sample of 217 product-moment correlations between measures of satisfaction and performance. The mean number of correlations included in the meta-analysis per study was 2.9; the maximum number contributed by a study was 18. **Table 1** summarizes the studies included in the meta-analysis, and it indicates those studies that were subject to this averaging process.

In addition to the information presented in Table 1, the reliabilities for the satisfaction and performance measures were recorded for any study that reported them. Only estimates of internal consistency reliability (e.g., Spearman-Brown, coefficient alpha, KR-20) were included for use in the Hunter et al. (1982) corrections. Satisfaction-performance correlations specifically noted to have been corrected for attenuation were excluded, because this would result in correcting for this source of variance twice (Hunter et al., 1982). The 74 studies provided a total of 63 satisfaction-measure reliability estimates and 26 performance-measure estimates; this sample was judged to be adequate for computation of the reliability corrections.

Each correlation coefficient was also coded on a set of nine dummy-coded study characteristics, the derivation of which was previously discussed. Because measurement conditions often varied within a study (e.g., two types of samples or satisfaction measures were used), a separate set of study conditions was coded (*0* or 1, as indicated in

Table 1 Summary of Studies Included in the Meta-Analysis

Study	*Subjects*	*Satisfaction measure*	*Performance criterion*	*Included correlation*
Abdel-Halim (1980)	123 salespeople	JDI (5 subscales)	Supervisor rating	5 *r*s (.00–.23)
Arvey & Gross (1977)	116 full-time female homemakers and job holders	MSQ short form (overall), global self-rating	Self-rated effectiveness	.38
Bagozzi (1978)	161 industrial male salespeople	8 item (specific facets)	Dollar volume of sales	.30
Baird (1976)	167 employees of 8 jobs in state agency	JDI (5 subscales)	Supervisor ratings	5 *r*s (.03–.23)
Bhagat (1981)	32 medical students	JDI (work, supervision, co-workers)	Problem, test scores	.39, .38[a]
Bhagat (1982)	104 managers	JDS short form	Supervisor ratings	.35
Brayfield (1944, cited in Brayfield & Crocket, 1955)	231 female office employees	Brayfield-Rothe Job Satisfaction Blank	Supervisor ratings	.14
Brayfield & Mangelsdorf (1950, Cited in Brayfield & Crockett, 1955)	55 plumber apprentices	Brayfield-Rothe Job Satisfaction Blank	Supervisor ratings	.20
Brayfield & Marsh (1957)	50 farmers in training	Brayfield-Rothe Job Satisfaction Blank	Instructor ratings	.11
Breaugh (1981)	112 research scientists	JDS (work, supervision)	Supervisor ratings	4 *r*s (-.11–.24)[a]
Brief & Aldag (1976)	77 nursing aides	JDI (work, supervision)	Self- & supervisor ratings	4 *r*s (-.20–.17)
Carlson (1969)	254 blue- and white-collar employees	Hoppock Job Satisfaction Blank	Supervisor ratings	.17, .13
Cherrington et al. (1971)	90 college students	Semantic differential scales (specific facets)	Score on laboratory task	8 *r*s (-.03-.22)[a]
Dipboye et al. (1979)	222 scientists and engineers, 73 firefighters, 264 clerical workers	Single item "work itself," MSQ short form (overall)	Self- & supervisor ratings	6 *r*s (.02–.35)[a]
Doll & Gunderson (1969)	195 civilian scientists and navy enlisted	5 items (general satisfaction)	Supervisor ratings, peer nominations	-.09, .12
Dyer & Theriault (1976)	392 managers	JDI (pay scale)	Self-ratings	–.21[a]
Gadel & Kriedt (1952)	193 IBM machine operators	10 items (general satisfaction)	Supervisor ratings	.08
Gavin & Ewen (1974)	471 semiskilled airline employees	53 items (5 facets)	Supervisor ratings	5 *r*s (.01–.31)[a]
Gould (1979)	134 administrative and managerial employees in public agency	JDI (work scale)	Supervisor ratings	.35
Green et al. (1983)	100 bank managers and employees	JDI (work, supervision, and co-workers)	Supervisor ratings, $ value of over/underages	–.01, .06, .05
Greene (1972, 1973b)	142 first-line managers	Bullock's Scale of Job Satisfaction	Supervisor ratings	.58
Greene (1973a)	62 first-line managers	Bullock's Scale of Job Satisfaction	Peer ratings	.21, .33[a]
Greenhaus & Badin (1974; Study II)	61 college students	1 item (overall task satisfaction)	Score on laboratory task	.28, .33[a]
Griffin (1980; Time 1)	88 nonsalaried manufacturing employees	Alderfer's ERG scale (satisfaction with job, supervision)	Average daily productivity index	-.13, –.04, –.26

Table 1 Summary of Studies Included in the Meta-Analysis (continued)

Study	*Subjects*	*Satisfaction measure*	*Performance criterion*	*Included correlation*
Hackman & Lawler (1971)	208 telephone employees in plant and traffic dept.	3 items (general satisfaction)	Supervisor ratings	.07, .08, .16
Hall et al. (1978; Time 1)	153 operating level and supervisors in transportation ministry	JDI (work scale)	Self-ratings	.22
Harding & Bottenberg (1961)	376 Airmen	Combination of 8 job facets	Supervisor ratings and rankings	.26[a]
Heron (1954)	144 bus conductors	10 items (several facets)	Composite of supervisor ratings, cash shorts, lates, gross earned	.35
Inkson (1978)	93 semiskilled and unskilled plant workers	JDI (5 subscales)	Supervisor ratings	5 *r*s (.08–.32)
Ivancevich (1978)	62 machine repair technicians, 108 machinists	MSQ (intrinsic and extrinsic) short form	Supervisor ratings, daily production records	8 *r*s (.13–.23)[a]
Ivancevich (1979)	48 construction engineers, 42 contract engineers	MSQ (intrinsic and extrinsic) short form	Supervisor ratings	8 *r*s (.15–.24)[a]
Ivancevich (1980)	249 discipline engineers	MSQ (intrinsic and extrinsic) short form	Individual cost ratio, scheduling index, grievance index	.11, .12[a]
Ivancevich & Donnelly (1975)	295 trade salespeople	20 items (6 specific facets)	Efficiency index, route-coverage index	6 *r*s (.05–.22)[a]
Ivancevich & McMahon (1982)	209 discipline engineers	MSQ (intrinsic and extrinsic) short form	Control costs, quality citations, unexcused overtime, supervisor ratings	4 *r*s (-.35–.39)[a]
Ivancevich & Smith (1981)	150 field sales representatives	MSQ (intrinsic and extrinsic) short form	New accounts, orders per sales presentation	.06, .10[a]
Jacobs & Solomon (1977)	251 chemical salespeople and managers	JDI (5 subscales), Faces Scale	Supervisor ratings	6 *r*s (-.04–.19)
Joyce et al. (1982)	193 first-line supervisors	JDI (work scale)	Supervisor ratings	.08
Kesselman et al. (1974)	76 telephone co. operators and female draftspeople	JDI (5 subscales)	Supervisor ratings	5 *r*s (.18–.46)
Kirchner (1965)	72 outdoor advertising salespeople	Brayfield-Rothe Job Satisfaction Scale	Total sales points	.46
Landy (1971)	175 engineers	5 facets of satisfaction	Co-worker ratings	5 *r*s (-.02–.06)[a]
Lichtman (1970)	95 technical, firstline supervisors, middle managers	17 items (general satisfaction)	Supervisor ratings	.21
Locke (1965; Study II, III)	71 college students, 112 college students	JDI (work scale)	Success on laboratory task	.43, .41

Table 1 Summary of Studies Included in the Meta-Analysis (continued)

Study	*Subjects*	*Satisfaction measure*	*Performance criterion*	*Included correlation*
London & Klimoski (1975)	153 registered nurses	JDI (work, supervision, co-worker scales)	Self-, co-worker, & supervisor ratings	5 *r*s (-.17–.12)[a]
Lopez (1982)	579 fulltime employed MBA students	JDI (5 subscales), MSQ short form (overall, intrinsic, extrinsic)	Supervisor ratings	8 *r*s (.08–.52)
Mirvis & Lawler (1977)	160 bank tellers	6 items (intrinsic satisfaction)	Shortages	.10
Mossin (1949)	94 female dept. store salespeople	9 items (satisfaction with various job conditions)	Shopper ratings of skills, attitudes	-.05
Motowidlo (1982)	92 sales representatives	7 items (pay satisfaction)	Sales value, supervisor self-ratings	4 *r*s (-.11–.35)
Nathanson & Becker (1977)	57 physicians	9 items (various facets)	Peer ratings	.37[a]
Oldham et al. (1976)	201 bank clerks	JDS (pay, security, social, supervision) facet scores	Supervisor ratings	4 *r*s (-.17– -.01)
O'Reilly & Roberts (1978)	301 naval aviation enlisted personnel	JDI (work, promotion, supervision subscales), Faces Scale	Supervisor ratings	4 *r*s (-.19– -.02)
Orpen (1974)	225 South African factory workers	Brayfield-Rothe Index of Job Satisfaction	Increase in error-free production	.33[a]
Orpen (1978)	103 South African first-level supervisors	Brayfield-Rothe Index of Job Satisfaction	Supervisor ratings	.23[a]
Penley & Hawkins (1980)	264 financial organization employees, some supervisors	JDI (5 subscales)	Supervisor ratings	5 *r*s (-.05– -.07)
Pierce et al. (1979)	398 insurance employees	MSQ (intrinsic, extrinsic), IOR (work satisfaction)	Supervisor ratings	.09, .20, .25[a]
Podsakoff et al. (1982)	72 supervisors, administrators in nonprofit organization	JDI (5 subscales)	Supervisor ratings	5 *r*s (-.11– -.39)
Porac et al. (1983; Study I & II)	81 registered nurses, 57 production employees	Single item (general satisfaction with day's performance)	Self-ratings	.72, .69
Pritchard (1973; Study I & II)	106 college students, 60 high school and college students	MSQ (1 pay item), JDI (pay scale)	Number of units laboratory task completed	4 *r*s (-.21–.28)[a]
Schriesheim (1980)	308 managerial and clerical public utility employees	JDI (supervision scale)	Self-ratings	.15
Schriesheim & Murphy (1976)	54 social service organization employees	MSQ (global) short form	Supervisor ratings	-.09
Sheridan & Slocum (1975)	35 managers, 59 machine operators	PNDQ (13 Job facets) ("2 is now" affective satisfaction responses)	Supervisor ratings, % of production standard earned	4 *r*s (-.09–.25)[a]

Table 1 Summary of Studies Included in the Meta-Analysis (continued)

Study	*Subjects*	*Satisfaction measure*	*Performance criterion*	*Included correlation*
Siegel & Bowen (1971)	86 MBA students	2 items (satisfaction with individual, group performance)	Instructor rankings, grades earned	4 *r*s (.03–.21)[a]
Spencer & Steers (1981)	295 technical and nontechnical hospital employees	JDS (general job satisfaction)	Supervisor ratings	.17
Steers (1975)	133 first-level supervisors	JDS (general job satisfaction)	Supervisor ratings	.26
Strauss (1966)	49 supervisory and nonsupervisory engineering and scientific personnel	Hoppock's Job Satisfaction Scale	Self-, peer, & supervisor ratings	.19, .29[a]
Stumpf (1981) and Stumpf & Rabinowitz (1981)	102 business school faculty	JDI (work, pay, promotion, and coworkers scales)	Productivity, instruction evaluation, peer nominations, merit increases, supervisor ratings	18 *r*s (-.05–.29)[a]
Sundstrom et al. (1980; Study II & III)	30 hospital clericals, 67 university secretaries, clerks, mechanics	Single item (general satisfaction)	Self- & supervisor ratings	.12, .12
Szilagyi (1980)	128 nonsupervisory clerical employees	JDI (work scale)	% of productivity standard	.07[a]
Tharenou & Marker (1982)	166 electrical apprentices	JDS (general satisfaction)	Supervisor ratings	.11
Wanous (1974)	80 telephone operators	JDI (overall), MSQ short form (overall), summated with 2 items (overall)	Supervisor ratings, quality/quantity indexes	.12, .21[A]
Wexley et al. (1980)	194 college students employed part time	MSQ (overall, intrinsic, extrinsic), JDI (work, supervision)	Supervisor ratings	5 *r*s (.01–.25)

MBA = Master of Business Administration
JDI = Job Descriptive Index
MSQ = Minnesota Satisfaction Questionnaire
ERG = Existence, Relatedness, Growth
IOR = Index of Organizational Reactions
PNDQ = Porter Need Description Questionnaire
JDS = Job Diagnostic Survey
* Values represent averages of values reported in original study.

Table 4, Table 5, Table 6) for each correlation used in the meta-analysis. For each study characteristic, a 1 indicates a condition that may be more facilitative of a higher correlation between satisfaction and performance than the alternative condition coded *0* (on the basis of suggestions from the satisfaction-performance literature discussed earlier). In some cases, however, this assumption is debatable.

When information about a study was insufficient to allow for positive determination of a given characteristic, it was coded as a missing value. Occasionally, a correlation was based on both alternatives of a coding category (most notably, the quantity vs. quality distinction was blurred when performance measures were composites of several indexes of performance). To maintain the interpretability of results, such cases were coded as missing values.

Because the studies were coded by a single rater, a random sample of 19 of the studies were selected and coded by a second, independent rater to establish a measure of interrater agreement. The measure of association selected was the Contingency Coefficient (C; Goodman, 1978), and this value was computed to be 0.65, $\chi^2(4, N = 171) = 125.8$, $p < .005$. Because the Contingency Coefficient is dependent upon the dimensionality of the χ^2 table, the maximum possible value (C_{max}) for this case was .81. Thus, it was concluded from the interrater agreement that a high degree of consistency in the coding of studies existed.

Statistical Analyses

In general, the data analysis consisted of two phases. The first phase resulted in estimates of the population parameters of the distribution of observed correlations. These mean and variance estimates were corrected for the effects of sampling error and attenuation due to satisfaction- and performance-measure unreliability. These estimates were computed first for the total sample of correlations and then in subgroups according to type of satisfaction assessed.

The parameter-estimation procedures followed those described by Hunter et al. (1982) as appropriate for instances in which individual studies do not provide sufficient information to correct each obtained correlation individually for the effects of statistical artifacts. Instead, the set of studies taken as a whole provides distributional information about the artifacts, which necessitates the use of correction formulas

tailored to this type of situation (Hunter et al., 1982, pp. 73–80). Thus, because of the sporadic reporting of information regarding the reliability of the job-satisfaction and job-performance measures used, information on these two indexes was compiled across studies for use in the correction formulas.

Because the particular type of satisfaction assessed (i.e., the use of specific facet vs. general/global satisfaction measures) was found to correlate significantly ($r = -.17$, $p < .01$) with the magnitude of satisfaction-performance correlation obtained for the total sample (converted to z scores), it was decided to compute additional sets of population estimates for subgroupings of correlations based on the type of satisfaction measured. The following nine subgroups of satisfaction measures were identified by inspection of the data, and these groups of correlations were analyzed separately via the same set of Hunter et al. (1982) formulas: (a) pay, (b) promotion, (c) supervision, (d) work, (e) co-workers (primarily measured via the JDI), (f) intrinsic, (g) extrinsic (primarily measured via the MSQ), (h) JDI and MSQ overall scores, and (i) other (including global/general satisfaction and miscellaneous). Corrections for attenuation for these subgroups were based on the entire distribution of performance-measure reliabilities, but only the distribution of estimates of reliability for that particular satisfaction-measure type. In most cases, this greatly reduced the number of appropriate satisfaction-measure reliability estimates, resulting in low variances for satisfaction-measure reliability in the correction formulas.

The second phase of the data analysis consisted of a multiple regression analysis of the coded study characteristics with the obtained effect sizes similar to the meta-analytic techniques used by Smith and Glass (1977). The dependent variables in this analysis were the reported correlation coefficients between job satisfaction and performance, converted to Fisher z scores. The independent variables in this analysis were the nine coded study characteristics, which had been dichotomously scored. Simultaneous entry of the independent variables was used, and a listwise deletion of missing data was chosen (over pairwise), sacrificing some statistical power in favor of greater interpretability of results.

Low *n*s prevented computation of a separate multiple regression analysis for each of the nine previously identified satisfaction types. Therefore, bivariate correlations (point-biserial) between satisfaction-performance correlations (*z* scores) and eight of the nine coded study characteristics were computed for each of the nine satisfaction type subgroups. The seventh study characteristic (use of facet vs. general/global satisfaction) was omitted from this correlational analysis because the post hoc classification of correlations into nine satisfaction measure subgroups was simply an elaboration of this study characteristic. In addition, a chi-square analysis was performed to determine possible differences in the magnitude of observed correlations (*z* scores) over decades of publication.

Results

Table 2 summarizes the results of the Hunter et al. (1982) corrections for both the total sample of observed satisfaction-performance correlations and those reanalyzed by satisfaction type. The frequency-(sample size) weighted average correlation between performance and satisfaction of all types ($\bar{r}_{xy}$) was found to be .146; the corresponding variance of this distribution of observed correlations ($\sigma^2 r_{xy}$) was .029.

The last two columns in Table 2 present the culmination of the Hunter et al. (1982) procedures—estimates of the population parameters for the distribution of satisfaction-performance correlations. Based on these computations, the estimated true correlation ($\bar{\rho}_{\text{true}}$) between performance and all types of satisfaction measures, corrected for the effects of sampling error and attenuation due to unreliable measurement of both satisfaction and performance, is .17, with a variance ($\sigma^2 \rho_{\text{true}}$) of .016.

Values of the frequency-weighted mean observed correlation for the satisfaction subgroups were based on much smaller samples of correlations and nonindependent subject samples (due to the inclusion of more than one correlation from several individual studies). After correcting for the three sources of error variance (sampling error, satisfaction, and performance measure unreliability), the estimates of the mean correlation ($\bar{\rho}_{\text{true}}$) for these subgroups ranged from .06

Table 2 Average Observed Correlations and Estimated Population Values

Satisfaction type	No. r_{xy}	$\bar{r}_{xy}$	$\sigma^2_{r_{xy}}$	Total study sample size	σ^2_e predicted by sampling error	$\bar{\rho}_{true}$	$\sigma^2_{\rho_{true}}$
Pay	25	.054	.020	3,609	.007	.062	.017
Promotion	18	.123	.015	3,170	.005	.145	.013
Supervision	21	.162	.036	3,630	.005	.186	.041
Work	35	.175	.037	5,061	.006	.207	.043
Co-workers	20	.102	.021	3,037	.006	.123	.021
Intrinsic	18	.196	.023	2,096	.007	.230	.019
Extrinsic	179	.149	.035	2,205	.007	.175	.039
JDI & MSQ overall	54	.247	.019	1,534	.005	.286	.018
Other (e.g., global)	217	.155	.025	5,472	.009	.185	.023
Total sample		.146	.029	12,192	.017	.172	.016

Note. JDI = Job Descriptive Index; MSQ = Minnesota Satisfaction Questionnaire. Values for $-\rho_{true}$ and $\sigma^2_{\rho true}$. have been corrected for sampling error and attenuation due to satisfaction and performance measure unreliability, using the Hunter et al. (1982) formulas; $-r_{xy}$ and σ^2_{rxy} represent frequency-weighted observed values.

(pay satisfaction) to .28 (JDI and MSQ overall), with corrected variances ($\sigma^2\rho_{true}$) ranging from .013 to .043.[2]

To assess the effect that the use of varying measures of job satisfaction and job performance (having varying reliabilities) had on the estimated population correlation, estimates of the population correlation corrected for sampling error and performance unreliability only (.15), and sampling error and satisfaction unreliability only (.16), were computed for the total sample. These values are not substantially lower than the estimated total sample mean correlation corrected for all three sources of variance (.17), which suggests that the use of various satisfaction or performance measures (having presumably somewhat

2 For some satisfaction subgroups, the population variance estimates ($\sigma^2\rho_{true}$) are larger than the original observed variances ($\sigma^2_{r_{xy}}$) in correlations due to the nature of the correction formulas and the information that was available in the studies aggregated. For satisfaction subgroups, the means and variances of reliability estimates only for measures of that satisfaction type were used. In some cases, this reduced the number of satisfaction reliability estimates to only four or five and resulted in low variances in reliability. All other values in the correction equation held constant, the effect of such a relatively low variance in reliability estimates would be to increase the size of the population variance ($\sigma^2\rho_{true}$) over the value that would be obtained if more reliability estimates had been available.

differing reliabilities) across studies had little impact on the mean true correlation. These computations were not performed for each of the individual satisfaction subgroups, because the reliabilities of measures of the satisfaction construct used within these subgroups were relatively homogeneous, as evidenced by extremely small variances in subgroup-satisfaction reliabilities.

Because of the development of reliable satisfaction instruments as well as recent attempts to refine performance criteria, it might be expected that trends in the size of published satisfaction-performance correlations over the years would exist. However, results of the chi-square analysis, $\chi^2(12, N = 217) = 7.427$, demonstrated that there were no significant differences in the magnitude of satisfaction-performance correlations over the four time periods from which publications were obtained (**Table 3**). It is interesting to note the frequencies of the magnitudes of observed correlations, particularly that 41 out of the 217 satisfaction-performance correlations (19%) were negative, and only eight (3.6%) were greater than or equal to .44.

The intercorrelations among the nine coded characteristics are presented in **Table 4**. Three study characteristics—the nature of the subject sample used, the use of self-report versus performance data obtained from others, and the use of traditional versus experimenter-developed satisfaction instruments—appear to be relatively independent of the other characteristics, as demonstrated by the fact that they each were significantly intercorrelated with only one or two of the other eight study characteristics. However, several of the other characteristics were highly intercorrelated. In particular, two characteristics (quality/quantity and objective/subjective) were highly correlated

Table 3 Frequencies of Observed Correlations by Year of Publication

	Year of publication			
Observed correlation	Prior to 1960	1960-1969	1970-1979	1980-1983
$r_{xy} < .00$	1	1	22	17
$.00 \le r_{xy} < .18$	3	3	42	31
$.18 \le r_{xy} < .30$	1	3	41	17
$.30 \le r_{xy} < .44$	1	2	13	11
$r_{xy} \ge .44$	0	1	3	4

$\chi^2(12, N = 217) = 7.427$.

Table 4 Intercorrelations Among Nine Coded Study Characteristics

	Characteristic								
Characteristic[a]	1	2	3	4	5	6	7	8	9
Performance									
1. Composite vs. unidimensional		-.33*	.42*	.00	.43*	-.52*	-.07	.11	-.04
2. Longitudinal vs. crosssectional			-.44*	-.11	-.62*	.47*	.05	-.07	.10
3. Quality vs. quantity				.04	.44*	-.78*	-.20*	-.06	.04
4. Self-report vs. other information sources					.14*	.00	-.08	-.11	.12
5. Developed for experimental use vs. archival data						-.46*	-.17*	-.23*	-.03
6. Objective vs. subjective							.20*	-.11	.03
Satisfaction									
7. Specific facet vs. general/global								.25*	.20*
8. Traditional instrument vs. experimenter developed									.04
Sample									
9. White collar vs. blue collar									

Note. Sample sizes range from 139 to 217 due to missing data.
a. For each characteristic, the first alternative listed has been coded as 1, and the second alternative as 0.
* $p < .05$.

with each other ($r = -.78$, $p < .05$), suggesting that the inclusion of both of these characteristics in the coding of studies was redundant.

One other result suggested by the set of intercorrelations stems from the fact that some of the characteristics would be expected to have been related. For example, the characteristics quality/quantity and archival/experimental, and objective/subjective and archival/experimental should be related, because archival data are often objective, quantitative information, such as the number of units produced. Thus, the significant correlations among these characteristics may be taken as some indication of consistency in the actual coding process.

Table 5 summarizes the results of the multiple regression analysis of observed satisfaction-performance correlations (converted to Fisher's *z* scores) with the nine coded study characteristics. Visual inspection of the plotted residuals of this analysis detected no deviations from the regression assumptions of linearity and homoscedasticity.

A significant squared multiple correlation was obtained ($R^2 = .137$, $p < .025$), indicating that the nine characteristics were able to account for approximately 14% of the variance in satisfaction-performance correlations. Because of multicollinearity among the predictors (Table 4), an attempt to interpret beta weights to assess the relative predictive contributions of each of the nine individual study characteristics is not possible (Darlington, 1968). Consequently, they have

Table 5 Bivariate and Squared Multiple Correlation Between Nine Coded Study Characteristics and Observed Satisfaction-Performance Correlations

Characteristic*	*r*
1. Composite vs. unidimensional	–.02
2. Longitudinal vs. cross-sectional	–.09
3. Quality vs. quantity	.05
4. Self-report vs. other sources	.10
5. Experimental use vs. archival data	.11
6. Objective vs. subjective	.08
7. Specific facet vs. general/global	–.18
8. Traditional instrument vs. developed for experimental use	–.13
9. White collar vs. blue collar	.09

N = 135 due to listwise deletion of missing cases. Correlations converted to z scores for this analysis. R^2 = .137. $F(9, 125) = 2.218$, $p < .025$.

* For each characteristic, the first alternative listed has been coded as 1, and the second alternative as 0. The first six characteristics refer to performance measures, the seventh and eighth refer to satisfaction measures, and the ninth refers to the sample used.

been omitted from Table 5, and bivariate (point-biserial) correlations between the *z* scores and each of the nine study characteristics have been presented to provide some indication of the nature of these individual relations. Clearly, the assessment of specific facet versus general/global satisfaction is the characteristic most highly related to observed satisfaction-performance correlations ($r = -.18$), indicating that higher correlations were obtained when general or global satisfaction measures were used.

Because the type of job satisfaction assessed appeared to moderate the size of satisfaction-performance correlations obtained, the total sample of satisfaction-performance correlations (transformed to *z* scores) was divided into the previously described nine satisfaction types. The correlations (point-biserial) between *z* scores and eight of the nine study characteristics (specific facet versus global satisfaction omitted) appear in **Table 6**.

It should be noted that many of the cells of Table 6 have small *n*s due to this division into satisfaction-type subgroups, and that some of the correlations could not be computed due to a lack of variance in the study characteristics for that particular satisfaction category. Nevertheless, Table 6 does present some potential trends.

Table 6 Correlations Between Observed Satisfaction-Performance Correlations and Coded Study Characteristics by Type of Satisfaction Measured

	Observed correlations[b]								
Characteristic[a]	*Pay*	*Promotion*	*Supervision*	*Work*	*Co-workers*	*Intrinsic*	*Extrinsic*	*JDI& MSQ overall*	*Other (e.g., global)*
Performance									
I. Composite vs. unidimensional	- .04 (25)	–.04 (18)	.43 (20)*	–.16 (34)	–.11 (19)	.39 (18)*	.44(17)*	–.52 (9)	.20 (52)
2. Longitudinal vs. crosssectional	.33 (25)*	.11 (18)	–.35 (20)	–.08 (34)	.14 (19)	–.28 (18)	–.36 (17)	.30 (9)	–.06 (53)
3. Quality vs. quantity	–.34 (17)	–.60 (12)*	.59 (10)*	–.22 (21)	–.61 (9)*	.35 (17)	.52 (16)*		.05 (34)
4. Self-report vs. other sources	–.44 (25)*		–.14 (21)	.00 (35)	–.37 (20)*	–.21 (18)	–.04 (17)	–.11 (9)	.48 (54)*
5. Developed for experimental use vs. archival data	–.32 (25)	–.06 (18)	.49 (20)*	.07 (34)	–.04 (19)	.23 (18)	.16 (17)	–.48 (9)	.08 (48)
6. Objective vs. subjective	.08 (25)	.35 (18)	–.48 (20)*	.02 (34)	.27 (19)	–.37 (18)	–.45 (17)*	.48 (9)	–.09 (47)
Satisfaction									
8. Traditional instrument vs. experimenter developed	–.03 (25)	–.05 (18)	–.23 (21)	–.06 (35)	–.18 (20)	.00 (18)	–.30 (9)	.01 (52)	
Sample									
9. White collar vs. blue collar	.07 (25)	–.05 (18)	.14 (21)	.15 (34)	.04 (20)	–.04 (18)	–.17 (17)	–.10 (8)	.15 (52)

JOI = Job Descriptive Index

MSQ = Minnesota Satisfaction Questionnaire.

Correlations have been converted to *z* scores for this analysis. Correlations that cannot be computed due to lack of variance have been omitted.

a. For each characteristic, the first alternative listed has been coded as 1, and the second alternative as 0.

b. *n*s (in parentheses) vary due to missing data.

* $p < .05$

Note that the type of subject sample involved, the use of traditional versus home-made satisfaction instruments, obtained satisfaction-performance correlations involving satisfaction with work (via the JDI), and correlations based upon JDI or MSQ overall scores failed to show any significant relation. Note also that none of the study characteristics were consistently related to the satisfaction-performance correlations as a function of satisfaction type. Certain study characteristics were paired with certain satisfaction types, but no pervasive pattern among the characteristics was identified.

Discussion

Perhaps the most immediately striking result of this analysis is the correspondence between the (uncorrected) frequency-weighted mean correlation ($\bar{r}_{xy}$) obtained here and that reported by Vroom (1964). On the basis of the 20 estimates available at the time, Vroom reported the mean correlation between job satisfaction and job performance to be +.14. Those who questioned Vroom's (1964) conclusion may find it disconcerting that 20 years and at least 200 satisfaction-performance correlations later, the average correlation was found here to be nearly the same (+.146). Despite such psychometric and methodological advances as the development of refined measures of job satisfaction (e.g., the JDI), the recognition of the need to use larger sample sizes, and the increased use of longitudinal designs, the results of researchers' efforts to obtain high satisfaction-performance correlations have on the average not been more fruitful than those attempts reviewed by Vroom. Results of the chi-square analysis echo this conclusion in that there were no significant differences in the magnitude of observed satisfaction-performance correlations over the four time periods examined (prior to 1960, 1960–1969, 1970–1979, and 1980–1983). The standard deviation of this distribution of correlations ($\sigma^2 r_{xy}$ = .029; *SD* = .17), however, indicates that there is some sizable variability between studies in the correlations obtained. Hence, conclusions drawn from these results would necessarily be less precise than if the observed variance ($\sigma^2 r_{xy}$) had been virtually zero.

Estimated Population Parameters

Although the application of Hunter et al.'s (1982) corrections for the statistical artifacts of sampling error and measurement unreliability was expected to have a large impact on the estimate derived for the population (${}^{2}\rho_{\text{true}}$) correlation and yield a negligible residual variance ($\sigma^{2}\rho_{\text{true}}$), such was not the case. The overall population correlation estimate of .17 was not substantially higher than the simple frequency-weighted mean observed correlation of .146; however, the variance of this distribution was reduced to almost half its size as a result of these corrections (from .029 to .016).

With regard to the statistical significance of these estimates, Hunter et al. (1982) suggested that mean correlations that are more than two corrected standard deviation units from zero should be considered significant. In this case, from among the overall (.17) and subgroup population correlation estimates ($\bar{\rho}_{\text{true}}$ in Table 2), only one (JDI and MSQ overall) was able to meet this criterion. In the majority of cases, the estimated population correlation is not significantly different from zero. With regard to the corresponding population variance estimates, application of Hunter et al.'s (1982) χ^2 test showed the remaining overall variation (.016) to be nonsignificant, $\chi^2(216, N = 217) = 207.14$, although for each of the satisfaction subgroups the remaining variance was found to be significant ($p < .001$). Thus, following correction for artifacts, a significant degree of variation around each of the estimated mean subgroup correlations remained, although the residual variance for the total-sample correlation estimate was negligible. However, Hunter et al. (1982) warned that due to the high power of this test, even statistically significant variation may, in effect, be trivial.

Because these estimates represent the removal of the effects of only three of the seven potential sources of error variance, the logic behind Hunter et al.'s (1982) form of meta-analysis would suggest that this remaining variation is the result of the effects of range restriction, criterion contamination and deficiency, factor structure differences between different measures of the constructs, and computational and typographical errors in the original sources (cf. Hunter et al., 1982; Schmidt & Hunter, 1977). Each of these remaining potential sources of error variance are considered next. In addition, note that some or

all of this residual variance may be due to true variance across situations in the satisfaction-performance correlation (i.e., some degree of situational specificity may exist). This possibility is addressed further in the context of the multiple regression results.

The effect of range restriction on the values obtained for the population-correlation estimates is potentially large. To the extent that the variation in a variable (in this case, job performance) is less in a study sample than in the population as a whole, the obtained study correlation will be systematically smaller than that in the reference population (Hunter et al., 1982). It is likely that at least some restriction in the range of job-performance scores occurred in every study included in the present analysis because job incumbents usually served as subjects. Those employees who receive poor performance ratings are typically not retained and, thus, scores on the job-performance measures included here can most likely be assumed to not be representing the full range of possible performance levels. Yet the observed range of performance scores is probably representative of employed persons, the population to whom inferences are typically made. Therefore, the degree of range restriction is probably not relevant.

The second remaining uncorrected source of error variance is the existence of criterion contamination and deficiency. Again, this potential influence cannot be ruled out in the case of the present analysis. Supervisory ratings were used for more than half (approximately 60%) of the correlations included here; however, various aspects of performance were rated in each study. Although some effort was made to exclude correlations that were based on performance aspects irrelevant to this review (such as attendance, lateness), many studies described only the general factors on which ratings were based (e.g., quality, attitude, quantity) and did not list the individual items that were rated. Thus, some extraneous items may have been included or, conversely, some specific areas of performance that should have been assessed may have been overlooked. Similar contamination or deficiency could have occurred in the assessment of job satisfaction. As in the case of range restriction, this source of error variance represents a viable potential determinant of the results obtained here. However, no specific procedures exist in the Hunter et al. (1982) repertoire that would allow for the quantification of this effect.

The final source of error variance identified by Schmidt and Hunter (1977) and unassessed in the present study is the existence of computational and typographical errors in the original research. Once again, this is a potential source of variation not to be completely discounted. Although some attempt was made to minimize the problems caused by poor-quality research (by concentrating the data-collection process on well-respected academic journals), no journal or researcher is without an occasional typographical or computational error. Such effects have been judged to be important (Hunter et al., 1982), but unfortunately cannot be directly assessed without access to original raw data.

Impact of Study Characteristics

Given that the variance remaining for the satisfaction subgroups after the Hunter et al. (1982) corrections was significant, the search for potential moderators that might explain this variability would be judged appropriate. Yet, the results of the regression analysis were not overly compelling in that the nine study characteristics accounted for a statistically significant ($p < .025$), but not substantial, portion of the variance in satisfaction-performance correlations. Together, these nine characteristics of a study are only modestly related to differences in effect sizes between studies. When viewed singly, these methodological/measurement aspects, many of which have been assumed to be important determinants of the magnitude of observed satisfaction-performance relations, were found to be of little consequence (cf. Table 6).

Several points need to be made regarding this modest ($R^2 = .137$) relation between the study characteristics and observed correlations. First, eight of the nine study characteristics were not evenly distributed in terms of the occurrence of the two coding alternatives (e.g., for the fourth characteristic, 89.9% of the correlations were based on other sources of performance data, and only 10% were based on the alternative self-report). This skewness in the predictor variables would be expected to truncate the R^2 value obtained. Had their occurrence been more evenly distributed throughout the studies included here, these particular study characteristics may have accounted for more of the variation in observed correlations.

Second, when the regression results are considered, they suggest that these nine characteristics of a study have little systematic relation with the size of the satisfaction-performance correlation that will be obtained. This conclusion may seem counterintuitive because many of these study characteristics (such as type of subjects used or the use of longitudinal designs) have been assumed to be important in determining satisfaction-performance correlations. However, it may be that the variance in satisfaction-performance correlations is mainly due to error (i.e., the other four sources of error variance identified by Schmidt & Hunter, 1977, for which corrections were not made) and only slightly due to any systematic differences between studies in the way the two variables are measured or the way the study is designed.

Third, it is conceivable that there are systematic relations between other study characteristics not examined here and the observed satisfaction-performance correlations. As noted earlier, the nine coded characteristics were developed on the basis of several criteria, one being the feasibility of coding. It is certainly possible that variables such as the existence of technological constraints may restrict the relation that will be observed between job satisfaction and productivity. However, with past and current journal-reporting practices, such information is typically not available from individual studies, and thus the impact of these variables could not be assessed here.

The logical response to these conclusions then is found in the question of why some studies report high correlations between job satisfaction and job performance. Based on the data obtained here, two explanations of the eight high positive correlations (i.e., $r \geq .44$) that were observed may be offered.

The first approach is purely statistical in that these eight high correlations can be said to be simply chance occurrences. Given that the distribution of satisfaction-performance correlations was determined to have a mean ($\bar{\rho}_{\text{true}}$) of .17 and a standard deviation ($\sigma_{\rho_{\text{true}}}$) of .12, it would be expected that if the correlations approximate a normal distribution, 95% of the observed correlations would fall between −.07 and .41 (i.e., within ±2 *SD*). Therefore, approximately 2.5% of satisfaction-performance correlations would be expected to fall in the upper tail of this distribution, that is, having observed values greater than .41. The fact that 3.6% (8) of the observed correlations included

in the present review were greater than or equal to .44 (cf. Table 3) is consistent with this expectation. Thus, it is probable that unusually high satisfaction-performance correlations occur infrequently enough to be within expectations due to chance alone.

The second approach to explaining the occurrence of high satisfaction-performance correlations involves a post hoc examination of the eight individual cases to delineate any substantive commonalities that may be determinants of high correlations. The eight correlations greater than .44 were obtained from Kirchner (1965), Greene (1972 and 1973b), Kesselman, Wood, and Hagen (1974), Lopez (1982), and Porac, Ferris, and Fedor (1983), with two high correlations obtained from each of these last three studies. A case-by-case examination of these studies revealed few commonalities in sample size, year or source of publication, satisfaction and performance measures used, or the nine study characteristics that were included in this meta-analysis. The only notable trends that appeared were that (a) seven of the eight correlations were based on white-collar employees/professionals as subjects, (b) seven of the eight were based on subjective performance measures, and (c) six of the eight were based on combined subjective ratings of both quality and quantity of performance. Although these commonalities may appear to suggest substantive explanations for the occurrence of high satisfaction-performance correlations, the lack of significant relations between these coded study characteristics and the magnitude of observed correlations for the overall sample of studies (Table 5) lends little support for the viability of such explanations. Although all potential explanations have not been fully tested here, unusually high correlations which might be obtained in an individual study seem likely due to chance.

Substantive Implications

The conclusion that job satisfaction and job performance are only slightly related has many practical implications. The ideals of high job satisfaction and high productivity are valued in our society, and attempts to design work so as to jointly achieve these goals are continuous. Indeed, both management and union representatives generally endorse the notion that greater productivity would result if workers were more satisfied (Katzell & Yankelovich, 1975). Thus, the finding

that these two variables are not highly correlated questions the assumptions implicit in our organizational programs and policies, our research endeavors, and even in the expectations of those who review the satisfaction-performance literature.

Katzell and Yankelovich (1975) exemplified this implicit assumption in their review of policy-related satisfaction-performance research. Their intention was to determine how productivity and job satisfaction could be increased jointly. Although they concluded that this goal could not usually be achieved, they lamented their failure to find strong satisfaction-performance linkages.

> We *wish* (italics added) we could announce that our search had been completely *successful* (italics added), that it had clearly disclosed the secret of motivating people so that they are both satisfied with their work and productive in it. *Unfortunately* (italics added) ... the facts are still too incomplete and equivocal to permit that. (Katzell & Yankelovich, 1975, p. ix)

The implicit assumption that satisfaction and performance are ecologically related may have contributed to the publication of many empirical studies that disconfirmed this assumption. The name often given to such research is the *debunking paradigm*. Rosenthal (1979) observed that there is a bias against publishing nonsignificant findings in the belief that they are generally not noteworthy. It seems that articles addressing the satisfaction-performance relation have not been affected by this bias in that most published studies find a nonsignificant relation between these two variables.

Thirty years ago organizational theorists endorsed the prescription that a happy worker is a productive worker. Subsequent research has dispelled this assumption; however, there still exists residual support for its veracity, although often amended by a host of contingency factors. Support for the belief is evidenced in such popularized managerial techniques as job enrichment, participative decision making, and autonomous work groups. All these are undergirded by the tenet that worker satisfaction can be increased, which in turn will lead to improved performance. Indeed, some researchers hypothesized that the stronger the relation between satisfaction and performance (other things being equal; Lawler & Porter, 1967), the more effective the

organization. Some theorists proposed it is the quality of work, not the quantity, which is enhanced by having a satisfied work force. Yet other researchers sought conditions under which satisfaction and performance are more closely aligned, such as the contingency of rewards (Cherrington, Reitz, & Scott, 1971), the degree of stimulation in the work (Baird, 1976), and organizational pressure (Bhagat, 1982). The product of this research has been the formulation of models proposing under what conditions, or for what people (i.e., those with high self-esteem), satisfaction and performance will be more strongly related.

The empirical support for these contingency models, however, has not been overly positive. As was previously noted, only eight of the 217 satisfaction-performance correlations exceeded .44, and this degree of association leaves 80% of the variance in one variable unexplained by the other. Perhaps it is the manifest importance of these dual criteria for the world of work, or their hoary lineage in organizational research, but few other empirical relations have embraced the null hypothesis so often yet continued to foster additional research. Dunnette (1966) noted that fads influence the selection of research topics, and the degree of empirical support a topic receives often affects its longevity. It appears that the satisfaction-performance relation qualifies as a long-standing fad among organizational researchers, and researchers feel compelled to reinvestigate the topic despite a profusion of empirical nonsupport.

Given the significance of both variables in our work lives, it seems unlikely that investigations of their co-relation will ever completely dissipate. What we have learned to date is that under most employment conditions the two variables are only slightly related to each other. Under selected experimentally created employment conditions, the extent of their interrelation can be enhanced to some degree; however, these conditions are the exception, not the rule. To the extent that high worker satisfaction and high worker performance are desirable objectives, efforts to enhance both simultaneously by organizational interventions would be facilitated by their showing a nonindependent relation. The findings indicate, however, that in most cases each objective will have to be met by a different intervention, as efforts to embellish both concurrently are not likely to be successful. In fact, evidence exists that some interventions produce an enhancement in one variable and a diminution in the other.

Conclusions

In summary, this study represents a meta-analysis of one of the most often investigated topics in all of organizational research—the relation between satisfaction and performance. This topic is replete with major implications for both theoreticians and practitioners alike. Our results indicate, similar to the findings reported in the earlier reviews published over 20 years ago, that satisfaction and performance are only slightly related to each other. The amount of empirical support for the satisfaction-performance relation does not approximate the degree to which this relation has been espoused in theories of organizational design. It is almost as if the satisfaction-performance relation is itself what Chapman and Chapman (1969) called an illusory correlation, a perceived relation between two variables that we logically or intuitively think should interrelate, but in fact do not. Although we do not preclude the possibility that future architects of organizational structure may develop methods of designing work that result simultaneously in high productivity and worker satisfaction, we conclude such a covariant relation does not exist to any substantial degree in the literature published to date.

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