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The Industrial Worker Satisfaction Instrument was applied to 15,072 employees of a major aircraft production company and the responses were factor analyzed to oblique simple structure; a solution with nine interpretable factors was obtained. Results suggested that broad model on which the instrument was developed is useful, but that it should be viewed largely an heuristic device and not as reflection of actual attitude structure.

A. INTRODUCTION

A major and continuing problem for industrial and social psychologists in recent years has been the development and validation of instrument and techniques to analyze worker satisfaction quantitatively. One element of particular importance has been the identification, using factor analytic algorithms, of consistent, stable concepts that underlie job satisfaction. Several attempts have been made to create stable job satisfaction measures, such as the Minnesota Satisfaction Questionnaire (MSQ) and the Index of Organizational Reactions [IOR (13)]; however, existing instruments tend to suffer two major problems: (a) their factor structure is not stable and (b) the scope of *S* coverage is limited.

For example, Smith, Kendall, and Hulen (14) argue that acceptable measures of job satisfaction should analytically separate various aspects of satisfaction. It is reported, however, that the short form of the MSQ failed to provide such separation (2) in spite of the long form's previous validation (16). For the short form, only general factor, including both extrinsic and intrinsic sources of satisfaction, was found.

The Index of Organizational Reactions (11) using 42 items in an *a priori* scale design also demonstrated some difficultly in identifying stable factors. For one sample, an eight factor solution produced *a priori* company identification loadings on a single factor with a priori career future items (10). Although, for other samples, a six factor solution (based on 31 items) did reproduce six *a priori* scales either perfectly or with only one stray loading, the fifth sample also produced a single item loading on *a priori* company identification and career future scales. While the IOR certainly met the criteria of Smith, Kendall, and Hulen, the use of only six factors and 31 items made the scale somewhat limited in scope; i.e., the six factors, when rotated, excluded dimensions of attitude toward co-workers and physical environmental conditions.

A further recent development in the job satisfaction literature has been the expansion of issues from the relatively simple Herzberg based intrinsic/extrinsic benefits model, to a more comprehensive employee attitude model (9, 15). In this new formulation, job satisfaction is seen as a subdomain of the broader conception of employee attitude which involves all major aspects of interemployee and employee/employer relations. The Conference Board (7), for instance, argues that adequate measurement of employee attitudes should include at least six broad dimensions: 1) job satisfaction, 2) superior/subordinate relations, 3) organizational policies, procedures, and practices, 4) morale, 5) organizational climate, and 6) interpersonal communications.

A review of instruments currently available revealed that few are of sufficient scope to include all theoretically relevant issues, while others, such as the MSQ, do not appear to possess adequate analytical stability. It has therefore been determined that development and testing of a new attitude instrument is indicated; what has resulted is a 97-item Industrial Worker Satisfaction Instrument [IWSI (1)]. This paper reports the first factor analysis of the IWSI.

B. METHODS

Employees of a major industrial aircraft firm were administered the IWSI; of the approximately 16,000 employees contacted, 15,072 completed the questionnaire. Respondents were drawn from all

corporate locations in the United States, but predominantly from major production facilities located in the Midwest and East. Questionnaires were distributed to all centrally located employees (all but about 150 respondents) during working hours, on all shifts, by members of the research team. They were administered to groups of between about 25 and 150 respondents. Standardized instructions were employed, and sessions were supervised only by researchers not directly employed by the corporation. Individuals located in small facilities or district sales offices were reached by mail. For the groups, approximately 90 percent of respondents completed the questionnaire; for *Ss* reached by mail, approximately 50 percent responded.

Of those employees completing the survey, 8.8 percent were managerial/professional employees, 5.7 percent clerical workers, 7.4 percent technicians, 7.3 percent supervisors, 54.6 percent production workers, and 16.7 percent were other employees (guards, janitors, etc.) About 87.8 percent were white, 7.8 percent black, and 2.0 percent Spanish surnamed. Their age ranged from under 20 to over 60 with the mode (37.2 percent) between 20 and 29. About 54.3 percent were male. The vast majority of respondents were employed by the company for less than five years (63.6 percent), but 21.3 percent had been employed longer than 10 years.

C. RESULTS AND DISCUSSION

Eigenvalues were calculated for the correlation matrix. The Scree test (3) revealed 10 factors. An iterative principal axis solution was applied to the correlation matrix until communalities stabilized in the third decimal place. A Kaiser Varimax Orthogonal Rotation was applied to the factor matrix (12) followed by four graphical rotations (5) and, finally, a Maxplane cleanup rotation (6) which resulted in a 78.4 percent .10 hyperplane. All factors achieved a significant simple structure (4).

Item loadings ≥ .35 were included for factor interpretation. A summary of the factors may be found in Table 1. Nine of the 10 factors are interpretable. Loadings on Factor IX are generally low indicating the possibility of an error factor or at least a low probability of interpretation.

Table I
Factor Summaries

Item	Item	Loading
	Factor I: Quality of Compensation	
97	Fringe benefits are excellent.	-.757
3	When I retire, my pension will be adequate.	-.751
3	I am paid fairly for the work I do.	-.738
80	My pay is better than that for similar jobs in other firms.	-.704
90	The company insurance programs is outstanding.	-.641
62	Retirement worries me because I feel I will not have enough money.	.456
7	Salaries or wage increases are given to those who do a good job.	-.414
23	The company doesn't take care of its older employees.	.364
	Factor II: Quality of Supervision	
57	My supervisor knows his jobs.	.796
27	My supervisor takes a personal interest in me.	.799
65	My supervisor is good at representing our department's interest to management.	.759
78	My supervisor plays favorites.	-.725
22	When I try to talk problems over with my supervisor, my supervisor is not interested in my problems.	-.718

61	I feel like I work with, instead of for, my supervisor.	.717
45	My supervisor never takes my suggestions seriously.	-.683
17	My supervisor evaluates my work objectively.	.656
60	My supervisor makes sure that new employees are completely oriented.	.588
11	The amount of supervision that I get is about right.	.568
63	Most information I get comes from other employees not my boss.	-.557
83	It is not smart to trust your supervisor totally.	-.516
77	My boss is respected by higher management.	.457
4	I do not think my supervisor does a good job of planning ahead.	-.448
82	No one ever says “you have done a good job.”	-.427
	Factor III: Worker Commitment	
40	It’s okay for employees to take things from the company.	.537
95	Sometimes, the only way to get even with a company is to “screw things up.”	.530
71	We have to many silly safety requirements.	.473
44	There is too much “nit-picking” when it comes to inspecting my work.	.375
26	On the whole, I don’t like people I work with.	.334
	Factor IV: Worker Responsibility	
66	Too many workers just “skip work” for no good reason.	.533
19	Too many employees are “drunk” or “high” at work.	.463
59	Too many things are stolen from the company by employees.	.444
70	Employees don’t worry about production - they just put in their time.	.418
	Factor V: Work Pace	
68	It seems I always am working on rush jobs.	-.732
18	I have time to do my job right.	.699
37	The company sets unrealistic performance standards for the department.	-.606
50	Other departments do not appreciate the work my department does.	-.508
31	We waste a lot of time because management never plans ahead.	-.490
91	The different departments just can’t seem to get along.	-.486
87	Our department receives good cooperation from other departments.	.478
32	I don’t have the authority to match my responsibilities.	-.443
81	I don’t have the right tools or equipment to work with.	-.428
46	I don’t think the company spends enough time training our employees.	-.425
25	I feel like I had too many bosses.	-.421
44	There is too much “nit-picking” when it comes to inspecting my work.	-.387
86	I’m notified of changes which affect my in plenty of time.	.357
	Factor VI: Degree of Job Stimulation	
36	I am often bored with my job.	-.893
9	My job is usually interesting enough to keep me from getting bored.	.889
10	After a day’s work, I really feel like I have accomplished something.	.600
13	I’m in a “dead end” job.	-.444
85	I just hate to get up in the morning to go to work.	.396
	Factor VII: Opinion of Quality Control	
89	The company makes a really good product.	-.788
33	They don’t care what the product’s like - all the company wants is production.	.588

82	The standards set for quality control are just about right.	-.509
67	Too many production mistakes slip through.	.464
55	The company is committed to public service as well as making products.	-.397
	Factor VIII: Job Security	
39	You never know when you might get laid off.	.624
72	There is little changes of me getting laid off.	-.603
	Factor IX: Unnamed	
11	The amount of supervision I get is about right.	-.436
48	I don't feel that I get enough supervision.	.417
18	I have time to do my job right.	-.386
74	Management doesn't really understand problems of the average employee.	-.349
	Factor X: Worker Trust	
47	Members of my work group trust each other.	.493
29	I get along with the people I work with.	.484
34	My fellow employees try to do a good job for the company.	.454
30	I feel responsible for doing a good job.	.354
14	There is a feeling of teamwork in my department.	.350

The interpretation of most other factors is relatively clear. Essentially every item on Factor I is related to compensation concerns by the employees. Factor II provides a pattern of what employees considered features of supervision. Examination of the items on this factor seems to indicate that there are three main interrelated aspects to an employee's view of quality of supervision: 1) the competence of the supervisors, 2) the personal investment of the supervisors in the employee, and 3) the commitment of the supervisor to the needs of the employees.

Factor III may well represent one of the psychological dynamics of the individual as opposed to attitudes toward the employer. Considerable similarity exists between the items loading on this factor and items loading on the psychodeviance factor on Cattell's Clinical Analysis Questionnaire (8).

The employee's attitude concerning the responsibility of his fellow employees is represented in Factor IV; i.e., responsibility in terms of those behaviors concerning basic standards or commitment to the job. Factor V appears to be a work pace/task organization factor. It seems to be a dimension concerned with efficient organization by the company of both time and tasks aimed at effective production. It also provides an interesting contrast with Factor IV. Both aim at efficient production: Factor IV is oriented toward the employees themselves and what they can do (no drugs, skipping work, concern about production) while Factor V is aimed at what the company can do (time planning, general management planning, authority delegation, etc.).

The next two factors are interesting because they form clear dimensions. Employees were concerned both about the stimulation of their job (Factor VI) and the quality of the product they produced (Factor VII). They had strong feelings about the quality of the product they produced with a special emphasis upon the company's concern for quality and the quality standards the company set and enforced.

Factor VIII is probably the simplest and most obvious. In a factory setting it is of little surprise to find a dimension representing concern over being "laid off." Factor IX has the fewest salient loadings of any factor. While some aspect of quality of supervision (different from and simpler than Factor II) appears, there is a strong possibility that this is an error factor. Finally, Factor X seems to represent the trust and feelings of teamwork an employee has toward his fellow workers.

D. CONCLUSION

Factor analyzing the IWSI revealed that, while the *a priori* typology devised by the Conference Board was not supported *in toto*, applying an instrument developed on a broad model of employee attitudes resulted in conceptually consistent factors. Furthermore, these factors are identifiable over a large number of respondents drawn from locations predominantly in the eastern half of the United States who produce a variety of aircraft-related goods and services.

As for the Conference Board's typology, factors obtained generally reflect predefined categories, but there are certain major exceptions. Factors I (Quality of Compensation), VI (Degree of Job Stimulation), and VIII (Job Security) are all related to Job Satisfaction. Factor II (Quality of Supervision) and Factor V (Work Pace) are subsumed under the heading of Superior/Subordinate Interrelationships; Factor VII (Opinion of Quality Control) under Policies, Procedures, and Practices; Factors III (Worker Commitment) and IV (Worker Responsibility) are part of Morale; and Factor X (Worker Trust) is included under Organizational Climate. No single factor directly reflects the category of Interpersonal Communication. However, closer examination of actual items reveals that many factors involve complex issues of communication, trust, policies, and the like.

What these results suggest is that the Conference Board's typology, while an excellent tool for instrument development, should not be interpreted as reflecting actual structures of attitudes. Instead the typology should be viewed as a conceptual, heuristic device. It is doubtful, for instance, that workers would be able regularly to distinguish between the processes of communication as general conceptions and the specific organizational and interpersonal results of those processes. Similarly, there is a logical overlap between their feelings for their co-workers, which is included in the typology under Organizational Climate, perceptions of the quality of Interpersonal Communications, and perceptions of their own and others' Morale. The complexity and abstractness of issues such as these may well be expected to lead to some obscuring of theoretically relevant issues.

Finally, in regard to the argument of Smith, Kendall, and Hulin that acceptable measures of job satisfaction should analytically separate various aspects of satisfaction, the present results show that the IWSI meets their criteria. However, the data also suggest caution in interpreting the meaning of analytical separation. In this study, nine clear dimensions of worker attitudes have been determined, but again they were not monotonically equivalent to the theoretical model on which they were based. Thus, while analytical clarity is a desirable attribute of an empirical measure, lack of clarity alone should not be grounds for dismissing an instrument's utility. As in this case, the theoretical model underlying the instrument may not, when operationalized, result in concepts that form predefined categories. Or, because of organizational, subcultural, or locational differences, theoretically distinct issues may not be separated in the particular setting studied. In the current literature there are several significant and competing models of job satisfaction and employee attitudes, but none have taken precedence or shown themselves to be entirely reproducible in multiple applications. Therefore, theoretical models of employee attitudes, as well as competing measurement instruments, should be viewed as in a state of development. As such, their applicability to broad populations is yet to be demonstrated.

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