AD A135 450

WORK ENVIRONMENT QUESTIONNAIRES AND ARMY UNIT EFFECTIVENESS AND SATISFACTION MEASURES

Lyle M. Spencer, Jr., George O. Klemp, Jr., and Bernard J. Cullen
McBer and Company

LEADERSHIP AND MANAGEMENT TECHNICAL AREA

DTIC
ELECTE
DEC 7 1983
S
D

D

U. S. Army

Research Institute for the Behavioral and Social Sciences

September 1977

83

DTIC FILE COPY

U. S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency under the Jurisdiction of the
Deputy Chief of Staff for Personnel

JOSEPH ZEIDNER
Technical Director

FRANKLIN A. HART
Colonel,   US Army
Commander

Research accomplished under contract
to the Department of the Army

McBer and Company

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
Technical Report 491	AD-A135 450	

4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED
WORK ENVIRONMENT QUESTIONNAIRES AND ARMY UNIT EFFECTIVENESS AND SATISFACTION MEASURES	Technical Report
	6. PERFORMING ORG. REPORT NUMBER
	--

7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s)
Spencer, Lyle M., Jr., Klemp, George O., Jr., Cullen, Bernard J. (McBer and Company)	DAHC19-78-C-0003

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
McBer and Company 137 Newbury Street Boston, MA 02116	2Q163731A792

11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE
U.S. Army Research Institute for the Behavioral and Social Sciences 5001 Eisenhower Avenue, Alexandria, VA 22333	September 1977
	13. NUMBER OF PAGES
	151

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report)
--	Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE --

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

--

18. SUPPLEMENTARY NOTES

--

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Organizational effectiveness criteria	Intervention utility	Rewards
Work Environment Questionnaire	Item construction	Interpersonal
Organizational climate instruments	Reliability	relations
Command climate	Validity	Process
Unit effectiveness	Autonomy	variables

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report summarizes:

(1) a review of the existing military and civilian work environment and organization climate questionnaires;

(2) a compilation of data gathered in interviews with representative Army combat arms and support enlisted personnel; and → an (Continued)

DD FORM 1473 EDITION OF 1 NOV 65 IS OBSOLETE

i

Item 19 (Continued)

Outcome variables
Questionnaire construction
Feedback
Interviews
Satisfaction

Item 20 (Continued)

(3) an identification of empirical measures of Army unit effectiveness.

The report is intended for use both as a literature review and a "how-to-do-it" guide for Army Organizational Effectiveness Staff Officers (OESOs) developing work environment assessment instruments.

Accession For		
NTIS GRA&I	☒	
DTIC TAB	☐	
Unannounced	☐	
Justification		
By		
Distribution/		
Availability Codes		
Dist	Avail and/or Special	
A/1		

WORK ENVIRONMENT QUESTIONNAIRES AND

ARMY UNIT EFFECTIVENESS AND

SATISFACTION MEASURES

Lyle M. Spencer, Jr., George O. Klemp, Jr., and Bernard J. Cullen
McBer and Company

Submitted by:
T. O. Jacobs, Chief
LEADERSHIP AND MANAGEMENT TECHNICAL AREA

Approved by:

Edgar M. Johnson, Director
ORGANIZATIONS AND SYSTEMS
RESEARCH LABORATORY

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
5001 Eisenhower Avenue, Alexandria, Virginia 22333

Office, Deputy Chief of Staff for Personnel
Department of the Army

September 1977

Army Project Number
2Q163731A792

OE Technology
Development
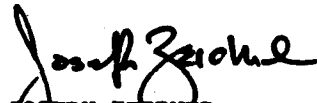
One of the goals of the Leadership and Management Technical Area is the development of better and more valid organizational effectiveness diagnostic instruments that Organizational Effectiveness Staff Officers (OESOs) could use. This report presents a compilation and comparison of extant work environment questionnaires in use in the military and private industry. In addition, the review presents the relationships which have been identified between Army unit effectiveness and satisfaction measures and the work environment questionnaire.

This report was prepared by McBer and Company under Army Project 2Q163731A792. The Deputy Chief of Staff for Personnel is the sponsor.

JOSEPH ZEIDNER
Technical Director

WORK ENVIRONMENT QUESTIONNAIRES AND ARMY UNIT EFFECTIVENESS AND
SATISFACTION MEASURES

BRIEF

Requirement:

To compile a guide for use in developing work environment assessment
instruments. This guide should be a "how-to-do-it" guide for OESOs and
researchers interested in Army unit effectiveness.

Procedure:

Three separate steps were taken in the development of this guide:

(1) a review of existing military and civilian work environment and
organization climate questionnaires;

(2) interviews with representative Army combat arms and support en-
listed personnel; and

(3) identification of empirical measures of Army unit effectiveness.

Findings:

Thirty-eight military and civilian work environment questionnaires were
reviewed in depth. These instruments were reviewed following a taxonomy
which includes: (1) the theoretical construction--to include scaling, item
content, item comprehensibility, response set, and style; (4) instrument
reliability; (5) instrument validity; and (6) intervention utility.

Utilization of Findings:

This guide will serve as a useful resource for any OESOs and researchers
who develop and tailor work environment/organizational climate questionnaires
to the Army.

WORK ENVIRONMENT QUESTIONNAIRES AND ARMY UNIT EFFECTIVENESS AND
SATISFACTION MEASURES

CONTENTS

LIST OF TABLES

CONTENTS (Continued)

Page

LIST OF FIGURES

I. REVIEW OF WORK ENVIRONMENT/ORGANIZATION CLIMATE INSTRUMENTS

More than 3,000 "instruments for assessing human behavior" are listed in reviews of this literature (Lake, Miles, & Earle, 1973; Pfeiffer & Heslin, 1973; Robinson & Shaver, 1976; Chun, Cobb, & French, 1976). These sources do not include many unpublished instruments developed by human relations consultants and military researchers for use in organizational interventions.

Review Criteria

The first task in reviewing existing work environment[1] questionnaires was to develop criteria for instruments to be examined. The following criteria were used.

Organization as Unit of Diagnosis

Instruments that did not measure aspects of organizational functioning were not reviewed. Four types of instruments were excluded under this criterion:

1. *Personality tests*. Measures of individual traits, characteristics, intelligence, attitudes, and the like (e.g., the Minnesota Multiphasic Personality Inventory, or the California Personality Inventory) were excluded as being clearly not directly related to organizational variables.

2. *Occupational preference inventories*. Measures of individual work preferences (e.g., the Strong-Campbell Vocational Inventory, Kuder Preference Test, or Navy Vocational Interest Inventory) were excluded as being primarily measures of individual attitudes, not variables of organizational functioning, although respondents' perceptions of organizational variables were included.

3. *"Group personality" tests*. A number of instruments (e.g., Stock & Thelen's "Reactions to Group Personality Test," Bales' "Interaction Process Inventory," Schutz's FIRO-B) have a quasi-organizational focus in that they attempt to measure the ways individuals will react in work groups. These instruments do not, however, measure aspects of the *organization* which impact on member behavior.

4. *"Managerial style" questionnaires*. These instruments (e.g., Blake & Mouton's GRID, Reddin's Management Style Diagnosis Test, Blanchard & Hersey's LEAD Self/Others, Hall's Leadership Appraisal Survey, Hemphill & Coon's "Leader Behavior Description Questionnaire" (Campbell, Fiedler's LPC Scale, Vroom & Yetton's "Authoritarian-Consultative Continuum") measure

---

[1]The terms "work environment" (WE) and "organizational climate" (OC) will be used interchangeably in this report.

supervisors' propensities, behaviors, or managerial practices in dealing with their subordinates. While managerial practices are definitely a component of work group members' environment or climate, these instruments measure this variable from supervisor self-reports rather than from subordinate perceptions. Managerial style questionnaires therefore resemble "group personality" tests in measuring how people think they will behave in organizational settings, rather than their behavior as an observable variable of organizational functioning.

Survey Response Format

Instruments that subjects could not answer by responding to closed-ended questions were not reviewed. Excluded under this criterion were structured interviews, group sensing and observation techniques (e.g., the group "interaction process analysis" methods of Bales, 1950, 1970; Stock & Thelen, 1958; and the organizational observation methods of Levinson et al., 1972; Argyris, 1970; and Mahler, 1974).

Organizational Process vs. Satisfaction

Certain "pure" satisfaction questions were not reviewed for two reasons. First, a comprehensive review of these instruments was recently completed by ARI (Motowidlo et al., December 1976). Second, as will be discussed later, both organizational intervention theorists and Army OESO practitioners recommend that satisfaction be considered an outcome of organizational functioning, and that work environment questionnaires should focus on organization structure and process variables which account for satisfaction and productivity outcomes, rather than feelings of satisfaction.

Statistical Analysis

Certain questionnaires which did not report statistical data on instrument reliability or validity were excluded if the interviewers were unable to interpret the meaning of instrument results in the absence of this information.

Military Use

Any instrument used in the Army, Navy, Air Force, Marine Corps, or other military organization was reviewed, whether or not is satisfied the preceding two criteria.

Table 1 summarizes the sources and construction characteristics of instruments reviewed in depth. A list of the instruments and instrument sources examined is found in Appendixes A and B.

Table 1

Sources and Construction Characteristics of Instruments Reviewed

Instrument	Use	Number of items	Number of sub-scale variables	Content of items[1]	Type of scales	Response bias	Descriptive anchor for scale
1. General Organizational Questionnaire	M (Army)	84	21	NA	5 pt. Likert	positive	no
2. Human Resource Management Survey	M (Navy)	88	25	DE	5 pt. Likert	positive	no
3. Organization Development Survey	M (Army)	101	items grouped	DE	5 pt. Likert	no	no
4. Leadership Evaluation and Analysis Program	M (Marines)	65	items grouped	E	5 pt. Likert	no	no
5. Occupational Attitude Inventory	M (Air Force)	235	--	E	9 pt. Likert	positive	no
6. Leader-Match	M	41	4	NA	Semantic and Likert	no	yes
7. Work Environment Questionnaire (Seneca)	M (Army)	109	items grouped	D,E,DE	7 pt. Likert and difference	positive	no
8. Measure of Morale	M (Army)	700+	NA	D	NA	NA	NA

Footnotes are found at end of table.

3

Table 1 (Continued)

Instrument	Use	Number of items	Number of sub-scale variables	Content of items[1]	Type of scales	Response bias	Descriptive anchor for scale
9. Military Leadership Survey	M (Army)	77	--	E,DE	7 pt. Likert and difference	no	no
10. Work Environment Questionnaire (Augsberg)	M (Army)	154	items grouped	D,E,DE	7 pt. Likert and difference	positive	no
11. Work Environment Questionnaire (32nd AADCOM)	M (Army)	500	items grouped	D,E,DE	5 and 7 pt. Likert, difference, yes/no	no	primarily no
12. Fort Ord Installation Wide Survey Instruments:	M (Army)						
Military Personnel		138	items grouped	E	5 pt. Likert	positive	no
Civilian Personnel		118		E	5 pt. Likert	positive	no
13. Organizational Survey (USAREUR)	M (Army)	76	items grouped	E	5 pt. Likert	positive	no
14. Measure of Military Attitudes	M (Army)	116	16	D,DE	5 pt. Likert	positive (most scales)	some
15. Military Company Environment Inventory	M (Army)	84 (long) 28 (short)	7	D,DE	true/false	no	no

Table 1 (Continued)

Instrument	Use	Number of items	Number of sub-scale variables	Content of items[1]	Type of scales	Response bias	Descriptive anchor for scales
16. Air Force Organizational Assessment Package	M (Air Force)	167	5 separate instruments	DE,E	7 pt. Likert	positive	no
17. Alderfer	B,E	51	--	D,E,DE	6 pt. Likert	no	no
18. Business Organization Climate Index	B	254	24	D,DE	true/false	no	no
19. Campbell & Pritchard	B	55	11	NA	NA	NA	NA
20. Agency Climate Questionnaire	B	80	--	D	5 pt. Likert	no	no
21. Work Climate	priests	35	--	D,DE	3 pt. Likert	positive	no
22. Litwin & Stringer (McBer version)	B	88	--	D,DE	6 pt. Likert	no	yes
23. Organizational Description Questionnaire	B	82	19	NA	7 pt. Likert	NA	NA
24. Organizational Climate Description Questionnaire	E	64	--	D,DE	4 pt. Likert	no	no
25. Michigan Organizational Assessment Package	B,E	350 (150 in short version)	items grouped	E,DE	7 pt. Likert & semantic	no	no

Table 1 (Continued)

Instrument	Use	Number of items	Number of sub-scale variables	Content of items[1]	Type of scales	Response bias	Descriptive anchor for scales
26. Profile of Organizational Characteristics	B	51	8	DE	21 pt. Likert	no	yes
27. Survey of Organizations	B	98-111	23+(?)	DE	5 pt. Likert	positive	no
28. Motivation & Working Relations of Scientists & Engineers Questionnaire	B,G	230 (long) (?) (short)	13(?)	D,DE	Likert	no	some
29. College Characteristics Index	E,B	300	30	D,DE	true/false	no	no
30. Moos' Ward Atmosphere Scale	H	206 (long) 40 (short)	10	D,E	true/false	no	no
31. Hackman-Oldham Job Description Inventory	M,B	83 (long) 53 (short)	11(+8 subfactors)	D,E	7 pt. Likert	no	no
32. Moos' Work Environment Scale	B,G	NA	10	NA	true/false	NA	NA
33. Employee Motivation and Morale	B,G	24	5	D,E	4, 5 pt. choice	no	yes

6

Table 1 (Continued)

Instrument	Use	Number of items	Number of sub-scale variables	Content of items[1]	Type of scales	Response bias	Descriptive anchor for scales
34. McBer Work Analysis Questionnaire	M,B, G,E	88	3	D	6 pt. semantic differential	no	yes
35. McBer Organizational Inventory	B	200+	10	D	7 pt. Likert, forced choice, operant scoring, interviews	no	some
36. Forum Performance Audit	B	50	8	D	4, 5 pt. Likert	no	no
37. Encounter Group Leader Behavior Checklist	H,E	NA	4	D	NA	no	NA
38. Hay Associates Survey of Management Climate	B	57	NA	D,E	7 pt. Likert	no	no

[1] D = Descriptive (observation of facts) items
E = Evaluative (feelings) items
DE = Combination of Descriptive and Evaluative items

7

Figure 1 presents an outline of the points used to assess each instrument selected for review. This section discusses these points in detail in order to provide OESOs with a checklist of criteria and examples for use in developing future Army organization climate instruments.

Instrument Name

The instrument name used is that recorded on the title page of the instrument itself or referred to in the literature accompanying it. Otherwise the instrument is referred to by the name of its author (if given) or the organization in which it was used if no author is listed.

Use

If the instrument was used in a military organization (M), the service branch was indicated by Army (A), Navy (N), Air Force (AF), or Marine Corps (MC). Instruments from other organizational environments were noted as being private business and industry (B), educational institutions (E), governmental agencies (G), health care organizations (H), and "other" (O) environments such as communities and prisons. Sixteen military and 22 civilian instruments, a total of 38, were reviewed in depth.

References

References concerning the basis, interpretation, reliability and validity, and use in organizational interventions and replications studies were identified and reviewed where available. Many instruments lacked published references, or the cited references were out of print or untraceable. Conclusions drawn about certain instruments should be considered as being "to the best of the authors' knowledge," since undiscovered source materials may provide information listed as "not reported" in this review.

Basis

Instruments were classified as having one of three bases:

1. *Formal theory (hypothesis or model).* Many instruments were based on an identifiable theory of organizational behavior traceable to a specific author or authors. For example, the most common theoretical basis for the instruments reviewed included the "Systems 4" ideas of Likert (1961) and the "4-factor theory" of Bowers and Seashore (1966). Instruments based on this approach included the Army General Organizational Questionnaire, the Navy Human Resource Management Questionnaire, the University of Michigan/ Institute of Social Research Survey of Organizations. Numerous derivative instruments use items taken from the Likert/Bowers and Seashore research. Other instruments were found to be based on the theories of Maslow, Herzberg, McClelland, the Ohio State leadership studies, and the like.

8

Figure 1. Work Environment Questionnaire Instrument Review Taxonomy.

I. Instrument Name

II. Use

    A. Military (M)

        1. Army (A)
        2. Navy (N)
        3. Marine Corps (MC)
        4. Air Force (AF)

    B. Industry (B)

    C. Education (E)

    D. Government (G)

    E. Health (H)

    F. Other (communities, prisons, etc.) (O)

III. References

IV. Basis

    A. Academic theory (model, hypothesis)

    B. "Grounded" theory (interview, group sensing, etc.)

    C. "Shotgun empiricism" (source of items, rationale)

    Basic relevance, congruence, face validity for military organizations

V. Organization Component Assessed

    A. Supervisor: teacher, hospital doctors/staff, prison warden/ guards (managerial practices or "style")

    B. Job (task activity of organization)

    C. Subordinates: also students, patients, prisoners, etc.

        1. Individual personality
        2. Peers

    D. Organization

        1. Norms: standards, conformity, etc.
        2. Policy/procedures

Figure 1 (Continued)

E. Exogenous (general economy, culture, competition, suppliers, legal, regulatory, political)

F. Outcome

1. Performance
2. Satisfaction

VI. Variables (matrixed by organizational component assessed)

VII. Item Construction

A. Scaling

1. Anchors

2. Format

(a) Likert
(b) semantic differential
(c) forced choice
(d) number: forced ranking, distribution of points
(e) difference
(f) other (operant, free response, etc.)

3. Scale range

4. Neutral points: midpoint (odd number) vs. no midpoint (even number)

B. Item Content

1. Cognitive
2. Affective evaluation (E)
3. Descriptive (D)
4. Behavior

C. Item Comprehensibility

1. Reading level
2. Item length
3. Semantic
4. Syntactics
5. Appearance: response format
6. Undimensionality

D. Response bias: response sets and response styles

1. Response set

(a) consistent positive: "halo" effects
(b) item order and grouping

10

Figure 1 (Continued)

2. **Response styles**

    (a) acquiescence
    (b) social desirability: distancing
    (c) understatement (cautious) responses
    (d) extreme (dominant) responses
    (e) inconsistency ("lie") responses

E. Item and Instrument Rejection

1. Length
2. Interest, salience, and "face validity"
3. Incomprehensibility
4. Threat

VIII. Instrument Reliability

A. Sample

B. Scale (split half)

C. Test-retest

D. Factor

IX. Instrument Validity

A. Construct: "face," content, convergent validity

B. Criterion: concurrent, predictive--"causal flow model" statistics (cross-sectional vs. longitudinal: time lag correlation designs)

X. Intervention Utility

A. Administration

1. Length: number of items and administration time

2. Administration instructions

    (a) rapport: explanation
    (b) confidentiality
    (c) motivation: "What's in it for you"

3. Resources/supplies required

B. Processing

1. Scoring: hand, computer punch, opscan
2. Analysis: hand, computer
3. Resources required: data processing equipment, etc.
4. Turnaround time

11

Figure 1 (Continued)

C. **Feedback: motivation and direction for change**

    1. Number of variables (more than "7 ± 2")

    2. Format

        (a) simplicity
        (b) visual impact
        (c) motivating comparison: actual-ideal, normative, achievement, absolute
        (d) specific directions for change indicated

    3. Salience

        (a) clear link to performance and satisfaction criteria
        (b) face validity
        (c) no normative bias

    4. Consultant/client training/level of expertise required to use instrument, make sense of feedback

D. **Evaluation**

    1. Formative
    2. Summative
    3. Policy (management information systems) use

Instruments based on formal theory have the advantage of providing data in a coherent context that helps organizational consultants and their clients interpret results and, in some cases, identify specific action steps to improve the organization's work environment. Theory-based instruments are more likely to offer supporting literature and validation data from other settings which increase the instrument's credibility for users.

The disadvantage of theory-based instruments is that they are often strongly biased in favor of "one right managerial approach" which may or may not be relevant to the organization in which they are used. This is particularly true of the adaptation of civilian instruments for use in military settings. Civilian theorists' instruments are frequently based on student or industry samples, and present data in a way that advocates managerial approaches (e.g., "humanistic" psychology, "democratic-participative" management) which may not be appropriate to military organizations. These instruments can have low face-validity for respondents and may jeopardize the credibility of the intervention effort or lead consultants to make recommendations inappropriate to their clients.

2. *Grounded theory*. Some instruments were based on interview, group sensing, and observation research in specific organizations--the "grounded" theory approach recommended by Glaser and Strauss (1967). In this approach, survey designers go directly to organizational members and ask them to describe their concerns, what aspects of their organization contribute to satisfaction and productivity, and what aspects result in low morale and performance. These open-ended responses are then content-analyzed by the survey developers, who select the most frequent comments and write them in survey item form, using the organization members' own words as much as possible. The resulting "tailored" survey is then administered to the organization's members to collect quantitative data.

The advantage of this approach is that it results in an instrument that is face-valid and directly relevant to the concerns of organizational members being surveyed. This may increase respondents' motivation to complete the survey accurately and help organizational consultants win acceptance for an intervention program. The disadvantage of grounded surveys is that responses to an assorted collection of items may prove difficult to interpret or to feed back to respondents.

3. *Empiricism*. Some instruments are developed by administering lengthy questionnaires containing items drawn from a variety of sources, then computer-analyzing responses to identify items and factors which seem to relate to the organization's functioning. This approach has the advantage of examining in an unbiased way the widest range of possible variables that may be important in a given setting.

Its disadvantages are that the resulting survey may not appear relevant to respondents in the organization and that "shotgun empiricism" frequently produces too many variables unrelated by coherent structure or theory, which makes use and interpretation of results difficult.

Most climate instruments involve the use of all three formal theory-based approaches at some point in their development. Instruments usually

13

have grounded theory origins. For example, the ISR Survey of Organizations, formal theory parent of the Army and Navy's present WEQs, was based originally on interviews (Bowers & Seashore, 1966). Empirical analysis of formal and grounded theory-based instruments often results in their modification. The Army General Organization Questionnaire and Navy Human Resource Management Survey have diverged from their civilian parent as a result of such analysis.

Table 2 summarizes the theoretical bases of the instruments reviewed in the present study. Approximately half of the 38 instruments examined in detail stemmed from 10 identifiable theoretical frameworks. No single theory dominates the field as a source of instruments, although the Likert/Bowers and Seashore framework has been most widely used in the Army and Navy. The theoretical antecedents of an instrument generally influence the original pool of items. For example, the Likert/Bowers and Seashore framework emphasizes interpersonal variables, paying less attention to job or task variables. By contrast, Hackman and Lawler's framework focuses almost exclusively on job and task variables.

Another form of influence occurs when a normative theoretical framework is used. In this case there is an increased tendency to use evaluative rather than descriptive items, thereby increasing the possibility of response biases.

Finally, some theoretical frameworks determine not only the pool of items, but also the form of the questions. This is most readily seen in the case of expectancy theory and the Army's work environment questionnaire, where the theory requires assessments of the importance of particular outcomes and their expected contingencies.

The number of explicitly grounded theories is small. This is somewhat misleading, however, since a number of the theory-based instruments also utilize interview and observational techniques to establish item pools.

The empirical category is somewhat of a residual category since it includes instruments spliced together from pre-existing instruments (Michigan Organizational Assessment Package), instruments based on particular groups or settings (Work Climate of Priests and Agency Climate Questionnaire), and instruments that give every indication of generating formal theoretical frameworks (Ward Atmosphere Scale and Military Company Environment).

The relatively large number of empirically-based instruments underlines the dilemma associated with choosing either a general instrument or one specifically tailored to the setting. The dominance of the latter solution substantially reduces the opportunities for cross-validation of even the subscales of pre-existing instruments.

Table 2

Bases of Instruments Reviewed

_____

1. Formal Theory

   a. Likert/Bowers & Seashore   Profile of Organizational
                                         Characteristics
                                         Survey of Organizations
                                       General Organizational
                                         Questionnaire
                                       Human Resource Management Survey

   b. Ohio Studies in Leadership   Military Leadership Survey
                                         Organizational Climate for
                                       Schools

   c. Fiedler-Contingency Theory   Leader-Match
      of Leadership

   d. Porter & Lawler's Expectancy   Work Environment Questionnaire
      Model of Motivation

   e. Maslow's Theory of Needs   Alderfer's Satisfaction and
                                         Desire Measures

   f. Blake & Mouton Two Factor   Organizational Climate
      Theory   (Greiner et al.)

   g. Murray & Lewin   Business Organization Climate
                                         Index
                                       College Characteristics Index

   h. McClelland & Atkinson   Organizational Inventory
                                       Organizational Climate Survey
                                       Questionnaire
                                       Work Analysis Questionnaire
                                       Performance Audit

   i. Contingency Theory   Organizational Description
                                       Questionnaire

   j. Hackman & Lawler, Job   Job Diagnostic Survey
      Characteristics

2. Grounded Theory   Measure of Morale
                                       Leadership Evaluation and
                                       Analysis Program
                                       Motivation & Working Relations
                                       of Scientists & Engineers
                                       Questionnaire
                                       Measures of Military Attitudes

15

Table 2 (Continued)

3. Empirical	Employee Motivation and Morale
	Military Company Environment Inventory
	Ward Atmosphere Scale
	Work Environment Scale
	Organization Survey (USAREUR)
	Michigan Organizational Assessment Package
	Occupational Attitude Inventory
	Organization Development Survey
	Campbell & Pritchard Instrument
	Agency Climate Questionnaire
	Work Climate of Priests
	Survey of Management Climate

Organizational Components Assessed

Theories of organizational behavior usually propose a systems model to illustrate the components or factors of the organization and their inter-actions (Likert, 1967, 1973; Lawrence & Lorsch, 1970; Sieber, 1973; Kast & Rosenzweig, 1970). Work environment questionnaires can be analyzed by identifying and classifying items and variables in terms of the components and interactions they measure. The six organization components or factors illustrated in Figure 2 were used as a starting point in the present study.

Supervisor Variables

Any item or variable which related to supervisor behavior, managerial practices, or style was recorded under this component. The supervisor component was used for the "superior" or "person with power" in analogous organization situations (e.g., the teacher in classroom WEQs, doctor or staff in hospital settings, and the warden or guards in prison environ-ments). *Example:* "My supervisor is friendly and easy to approach."

Job Variables

Any item or variable that related to the work itself (the physical setting, technology, design variety, meaningfulness or intrinsic feedback resulting from task activities in the organization) was recorded under this component. *Examples:* "I get to do many interesting tasks in this job" or "I don't have adequate job training."

Subordinates Variables

Any item or variable that described the personalities, motivation, skills, or other characteristics of individuals in the organization or peers in work groups was recorded under this component. In analogous

16

Figure 2. Organizational components in a causal flow model.
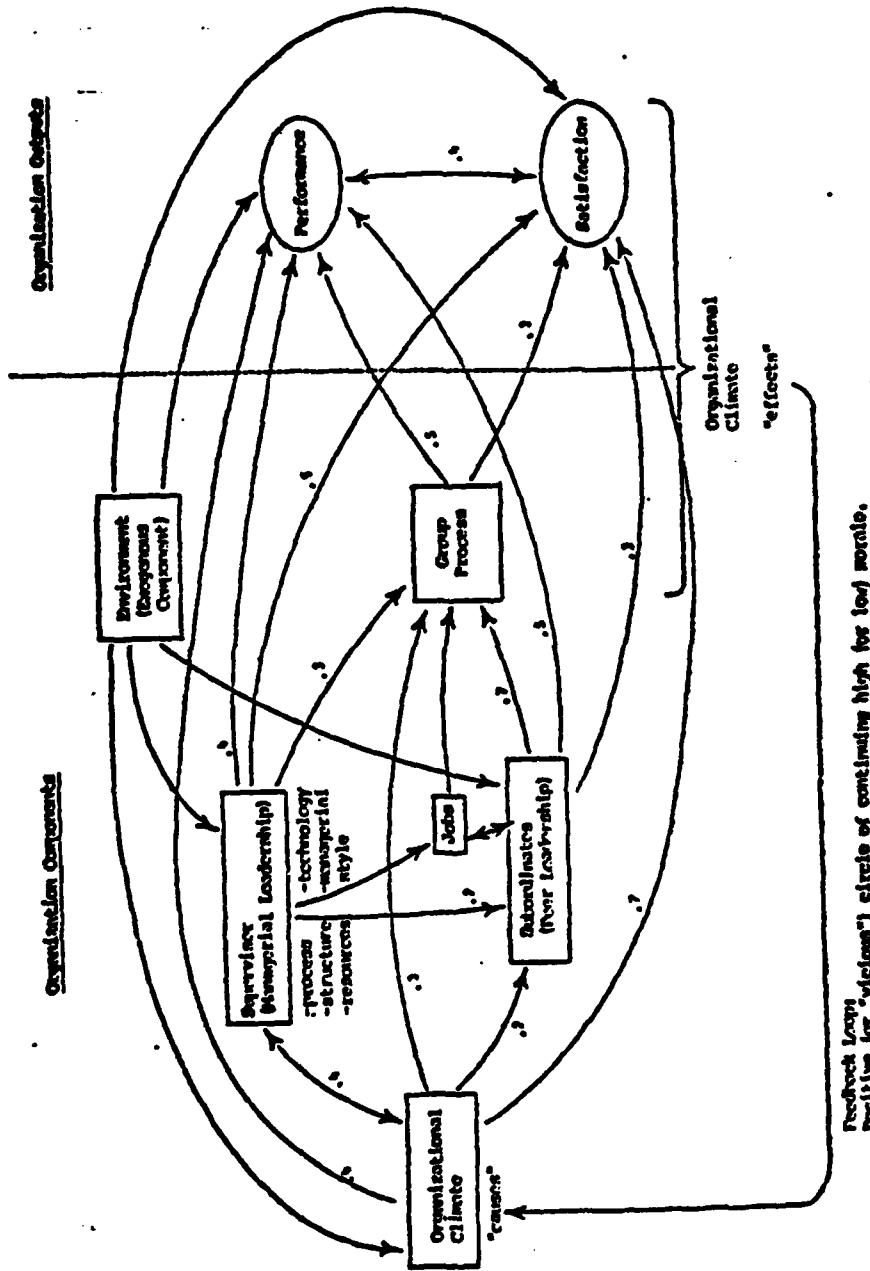
Explanation: Causal flow models assume that organizational climate can be both a "cause" of organizational functioning and an "effect" of it. It acts as a cause when a command's existing reputation as a high morale, effective unit--or a "loser" group--motivates or demotivates organizational members. Supervisors can influence jobs in the organization by changing processes, structures, resources or technology. Supervisors impact on subordinates directly with their managerial styles. Supervisor-subordinate-job interactions produce Group Processes which result in organizational performance and satisfaction outcomes. Members' perceptions of organizational group processes and outcomes describe Organizational Climate as an "effect" of organizational functioning. Exogenous variables--the larger economy, culture, market receptivity to the organization's products, etc.--impact the organization's members and its outcomes.

17

organizations, "supervisees" (persons inferior in power, such as students in educational settings, patients in hospitals, and prisoners) were considered "subordinates." *Examples:* "I want to do the best job I can in this job" or "My co-workers do not care about doing a good job."

Work Group Relations

Any item or variable which dealt with working relations in primary work groups (peer leadership, interactions involving face-to-face contacts, cooperation or conflict, norms, standards, and procedures) was recorded under this component. *Examples:* People are willing to help each other out in this work group" or "NCOs seldom listen to one another."

Organization Variables

Items or variables which described the organization as a whole (its norms, standards, rules, policies, or procedures) were recorded under this component. *Examples:* "There is continual pressure to improve job performance in this organization" or "Nobody is concerned about discipline in this unit."

Exogenous Variables

Items or variables which dealt with factors outside the organization, such as the economy, culture, competition, relations with supplier or customer organizations, union, legal, regulatory or political influences, were recorded under this component. *Example:* "My decision to reenlist will depend on how good a job I think I can get in the civilian economy."

Organization models often relate these components in a causal flow sequence which indicates how component variables influence one another to produce organizational outcomes (Likert, 1973; Pecorella, Hausser & Wissler, 1974; Franklin & Spencer, 1974; Turney & Cohen, 1976). Directionality and strength of path correlation coefficients are established by cross-lag correlation designs (see discussion under "Validity" below). Figure 2 sets out the six organizational components used in the present study in a causal flow sequence. Path coefficients illustrated are from Likert (1973), but Franklin (1973) reports quite different directionalities and path coefficient statistics (the Likert model does not recognize "job" and "exogenous" variables).

As indicated in Table 3, the work environment instruments reviewed differed considerably in the organizational components they assessed and the extent to which the assessed component was specified. Analysis of instrument variables indicated the "subordinate" and "work group" components tended to be redundant: Most "subordinate" items and variables (e.g., "My co-workers are friendly/cooperative/motivated.") could also be classified as "work group" variables. Consistent with the decision to focus on organizational rather than individual personality variables, it was decided to record judgments about peers as "work group" indices, and reports of the subject's own motivation, morale, or satisfaction as "satisfaction outcomes" rather than causes (as suggested by Motowidlo et al., 1976). "Exogenous" and "task performance outcome" items and variables

18

Table 3

Content Analysis of Instrument Items and Variables
by Organizational Component

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction	Process	Outcome
MILITARY INSTRUMENTS (N = 15)[1,2]														
ORGANIZATION	13	10	8	7	8	10	5	7	12	12	8	13	84	21
SUPERVISOR	12	13	12	10	9	10	6	11	11	7	4	10	101	14
WORK GROUP	12	6	11	4	3	9	2	7	7	4	8	9	65	17
JOB	4	13	4	7	8	7	11	7	10	3	7	12	74	19
TOTAL	41	42	35	28	28	36	24	32	40	26	27	44	324	71
CIVILIAN INSTRUMENTS (N = 16)[1]														
ORGANIZATION	8	8	9	7	10	7	2	8	12	1	2	9	72	10
SUPERVISOR	10	8	11	6	4	9	2	11	9	2	1	3	72	4
WORK GROUP	11	4	14	4	6	8	1	8	3	1	2	5	60	7
JOB	3	7	4	6	6	7	10	10	7	0	3	10	60	13
TOTAL	32	27	38	23	26	31	15	37	31	4	8	26	264	34
CLIMATE INSTRUMENTS (N = 31)[1]														
ORGANIZATION	21	18	17	14	18	17	7	15	24	13	10	22	156	31
SUPERVISOR	22	21	23	16	13	19	8	22	20	9	5	13	173	18
WORK GROUP	23	10	25	8	9	17	3	15	10	5	10	14	125	24
JOB	7	20	8	13	14	14	21	17	17	3	10	22	134	32
TOTAL	73	69	73	51	54	67	39	69	71	30	35	71	588	105

[1] Only instruments allowing detailed item analysis are included in this summary.

[2] Fort Ord survey counted twice.

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
General Organizational Questionnaire												
ORGANIZATION	●				●	●		●	●	●	●	●
SUPERVISOR	●	●	●	●		●		●	●	●		●
WORK GROUP	●		●		●	●		●	●	●		●
JOB		●		●	●	●	●		●	●	●	●
Human Resource Management Survey (actual questionnaire)												
ORGANIZATION	●	●	●	●	●	●	●	●	●	●		●
SUPERVISOR	●	●	●		●	●		●	●	●		●
WORK GROUP	●	●	●		●			●		●	●	●
JOB		●		●						●		●
Organization Development Survey (actual questionnaire)												
ORGANIZATION	●	●	●			●		●	●	●	●	●
SUPERVISOR	●	●	●	●		●		●	●		●	●
WORK GROUP	●	●	●			●		●	●		●	●
JOB	●	●	●	●	●	●	●	●	●		●	●
Leadership & Evaluation & Analysis Program												
ORGANIZATION	●	●	●	●	●	●			●	●	●	●
SUPERVISOR			●									
WORK GROUP	●											
JOB												●
Occupational Attitude Inventory (actual instrument)												
ORGANIZATION	●	●	●	●		●	●	●	●	●		●
SUPERVISOR	●	●				●				●		
WORK GROUP	●	●	●			●		●	●			●
JOB	●	●	●		●		●	●	●			●

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
Leader-Match												
ORGANIZATION												
SUPERVISOR	o		o						o			
WORK GROUP												
JOB						o	o					
Work Environment Questionnaire (SENECA)												
ORGANIZATION	●	●	●		●				●	●		●
SUPERVISOR	●		●	●	●	●			●			●
WORK GROUP	●	●	●		●	●		●	●			●
JOB		●			●		●	●	●		●	●
Measure of Morale (inferences from brief summary of factor analysis)												
ORGANIZATION	o					o					o	o
SUPERVISOR	o					o					o	o
WORK GROUP	o					o					o	o
JOB												
Military Leadership Survey (actual instrument)												
ORGANIZATION												
SUPERVISOR	●	●	●	●	●	●	●	●	●	●	●	●
WORK GROUP												
JOB												
Work Environment Questionnaire—P.S. Augsberg (actual instrument)												
ORGANIZATION	●	●		●	●	●	●		●	●	●	●
SUPERVISOR		●		●	●	●	●	●	●			
WORK GROUP	●	●	●			●		●	●		(●)	
JOB	●	●	(●)	●	●	●	●	●	●		●	●

(●) refers to Mode Controller Version rather than Floor Analyst.

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
Work Environment Questionnaire (32nd AADCOM) (actual instrument)												
ORGANIZATION	•	•		•	•	•	•	•	•	•	•	•
SUPERVISOR	•	•	•	•	•	•	•	•	•		•	•
WORK GROUP	•	•	•	•	•	•	•		•		•	•
JOB		•	•	•	•	•	•		•		•	•
Fort Ord: Installation Wide Survey—Military (actual instrument)												
ORGANIZATION	•		•	•		•	•		•	•		•
SUPERVISOR	•	•		•					•	•		•
WORK GROUP			•					•	•	•	•	
JOB		•				•		•	•			
Fort Ord: Installation Wide Survey—Civilian (actual instrument)												
ORGANIZATION	•	•					•	•	•	•	•	•
SUPERVISOR		•	•			•	•		•	•	•	•
WORK GROUP	•			•	•		•	•			•	•
JOB	•	•		•			•	•				•
Organization Survey (USAREUR) (actual instrument)												
ORGANIZATION	•	•			•			•		•	•	•
SUPERVISOR	•	•	•		•	•			•	•		•
WORK GROUP	•									•	•	•
JOB		•							•	•		•
Measures of Military Attitudes (actual instrument)												
ORGANIZATION	•	•	•	•	•	•		•	•		•	•
SUPERVISOR	•	•	•	•	•	•	•	•	•			
WORK GROUP	•		•			•	•	•			•	
JOB		•				•	•	•			•	•

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
Military Company Environment Scales (actual instrument)												
ORGANIZATION	•	•	•	•	•	•		•	•			
SUPERVISOR	•	•		•				•	•			
WORK GROUP	•	•	•	•	•	•	•		•			•
JOB		•		•	•	•	•		•			
Organizational Assessment Package (OAP) (actual instrument)												
ORGANIZATION	•[4]	•[4]	•[4]	•[4]	•[4]	•[4]	•[4]	•[4]	•		•	•[2]
SUPERVISOR	•[4]	•[4]	•[4]	•[4]	•[4]	•[4]	•[4]	•[4]	•			•[2]
WORK GROUP				•		•		•			•[3]	•[2]
JOB		•[1]			•[1]		•[1]	•[1]	•[1]		•[3]	•[2]
Alderfer's ERG Satisfaction Measure (actual instrument)												
ORGANIZATION	•	•							•			•
SUPERVISOR	•	•	•			•			•	•		•
WORK GROUP	•	•	•					•	•			•
JOB		•						•	•			•
Business Organization Climate Index (scales rather than items)												
ORGANIZATION	•	•	•		•			•	◑	•	○	
SUPERVISOR	•		•			○		•			○ ○	
WORK GROUP	○		○			○					○ ○	
JOB												

•   Organizational Climate Inventory

•[1] Organizational Job Inventory

•[2] Job Satisfaction

•[3] Perceived Productivity

•[4] Supervisory Job Inventory

23

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
Campbell & Pritchard Instrument (scales rather than items)												
ORGANIZATION	o		o		o	o		o	o			
SUPERVISOR	o		o		o	o		o	o			
WORK GROUP	o		o		o	o		o	o			
JOB								o				
Agency Climate Questionnaire (only items loading on factors)												
ORGANIZATION		●	●						●			
SUPERVISOR	●	●	●			●			●			
WORK GROUP			●			●		●				
JOB		●	●			●	●					
Work Climate (actual instrument)												
ORGANIZATION	●	●										
SUPERVISOR		●	●			●		●	●		●	
WORK GROUP			●									
JOB							●	●			●	●
Litwin & Stringer (McBer edition) (actual instrument)												
ORGANIZATION	●			●	●	●		●	●			●
SUPERVISOR	●							●				
WORK GROUP	●		●			●						●
JOB									●			●
Organization Description Questionnaire (scales only)												
ORGANIZATION		o	o	o	o	o		o	o	o		
SUPERVISOR												
WORK GROUP												
JOB												

24

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
Organizational Climate for Schools (actual instrument)												
ORGANIZATION	•		•		•	•			•		•	•
SUPERVISOR	•	•	•		•	•	•	•	•		•	•
WORK GROUP	•		•		•	•		•	•		•	•
JOB					•	•	•		•			
Michigan Organizational Package (actual items)												
ORGANIZATION	•	•	•	•	•			•	•			•
SUPERVISOR	•	•	•	•	•	•		•	•	•		
WORK GROUP	•	•	•	•	•	•		•	•			
JOB	•	•		•		•	•	•	•		•	•
Profile of Organizational Characteristics (actual items)												
ORGANIZATION		•	•	•	•	•		•	•			•
SUPERVISOR	•	•	•	•		•		•				•
WORK GROUP	•		•	•		•		•				
JOB		•	•					•				•
Survey of Organizations												
ORGANIZATION	•				•	•		•				•
SUPERVISOR	•	•			•	•						•
WORK GROUP	•	•			•	•					•	•
JOB				•								•
Motivation & Working Relations of Scientists & Engineers												
ORGANIZATION	o		o		o	•			o			•
SUPERVISOR	o	•	o	o	o	•		•	o •			•
WORK GROUP	o		o	o		o		• •	o			•
JOB			o	o	o	o	o	•				•

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
College Characteristics Index												
ORGANIZATION	•	•	•	•	•	•	•	••	••	•		•
SUPERVISOR	••	•	•••	•••	••••	•••	•••	••	•••	•		
WORK GROUP	•	•	•••	•••	•••	•••	••	•	••	•		
JOB			•	••	•	•	•					
Ward Atmosphere Scale (actual instrument)												
ORGANIZATION		•	•	•	•				•			
SUPERVISOR	•	•	••	••	••			•	•			
WORK GROUP	•	•	••	•				•				
JOB		•			•			•			•	
Job Diagnostic Survey (actual instrument)												
ORGANIZATION			•						•			
SUPERVISOR			•						••	•		
WORK GROUP	•		••					•	•••			••
JOB	•	•	•			•	•	•	••			••
Work Environment Scales (instrument not available)	○	○	○	○	○	○	○	○				○
ORGANIZATION												
SUPERVISOR												
WORK GROUP												
JOB												
Employee Motivation & Morale (actual instrument)												
ORGANIZATION												•
SUPERVISOR								•				
WORK GROUP					•			•				
JOB					•		•	•				

26

Table 3 (Continued)

	Support	Personnel development	Team work	Communications clarity	Order & organization	Standards	Job design	Responsibility (autonomy & influence)	Feedback & rewards	Justice	Task performance	Satisfaction
Work Analysis Questionnaire (actual instrument)												
ORGANIZATION												
SUPERVISOR												
WORK GROUP	●	●	●									
JOB	●	●	●	●	●	●	●	●	●			●
Organizational Inventory (actual instrument)												
ORGANIZATION			●	●	●	●		●	●			
SUPERVISOR								●				
								●				
WORK GROUP			●		●			●				
JOB							●	●				
Forum Performance Audit												
ORGANIZATION	●		●	●	●			●	●			
SUPERVISOR	●		●	●		●	●	●	●			
WORK GROUP	●		●	●		●		●	●			●
JOB				●			●	●				●
Survey of Management Climate (Hay Associates) (actual instrument)												
ORGANIZATION		●	●	●	●	●	●	●	●		●	●
SUPERVISOR			●	●								
WORK GROUP			●	●	●				●			
JOB				●	●	●	●		●			●

27

rarely appeared in the instruments reviewed and were subsumed by the organization category.

Variables and Items

Reviews of the work environment and organizational climate instruments usually attempt to identify generic variables, or variable factors that seem to appear in all instruments reviewed, and to describe attributes common to all organizations.

Campbell et al. (1970), in reviewing this literature, identified four factors as common across all the investigations:

individual autonomy: the degree to which an individual feels that responsibility has been delegated to him, that he can take initiative, make decisions and "be his own boss" without having to be constantly accountable to higher management (some instruments phrase this variable factor in negative terms, e.g., "conformity," "rules of orientation," or "over-control," to measure managerial practices or organizational procedures which deny people autonomy, responsibility, authority, or influence in their jobs);

structure: the degree to which objectives and methods for job performance are established by the organization and communicated clearly to individual members, and the extent to which managers plan and organize tasks efficiently;

reward orientation: the degree to which individuals in an organization receive feedback (primarily positive), rewards, and recognition for task performance or achievement of objectives;

consideration, warmth, and support: the degree to which managers or the organization provide support for individuals, relate to them socially, and help them with or take into consideration their personal needs in assigning them tasks.

This typology of work environment variable factors is congruent with the two major factors, task emphasis (initiating structure) and people emphasis (consideration) found in factor analyses of leadership styles (Stogdill, 1974).

Moos (1974), summarizing the literature on organizational climate instruments used in education and health care institutions, identified three basic dimensions:

relationship: "The involvement of individuals in the environment and the extent to which they support and help each other" (in Moos' Military Company Environment Inventory, 1973, this dimension is called "peer cohesion");

personal development: autonomy ("the extent to which people are encouraged to be self-sufficient and independent"), the amount of

28

training or informal coaching individuals receive, and the empha-
sis placed on personal career planning and advancement;

systems maintenance: the degree of order and organization, clarity
of expectations about maintenance and task objectives, and the ex-
tent of management control of people and outcomes.

Moos observes that in "work milieus" an additional "task" factor, variously
called "task orientation" and "work pressure," is usually present.

The present study identified 10 organizational process and 2 outcome
factors which adequately encompassed the items and variables in the instru-
ments reviewed, while providing greater discrimination among variable di-
mensions than that offered by the Campbell et al. and Moos typologies.

Items and variables dimensions which described observable specific
behaviors or characteristics of jobs or the organization were considered
process (e.g., "causal") variables, and were distinguished where possible
from outcome (e.g., satisfaction and performance) variables. For example,
"This organization sponsors many social activities for its employees" was
considered a process variable (an action of the organization), while "I
like my co-workers" was considered a satisfaction outcome (a result of the
organization's actions). Ambiguous items which involved evaluative re-
sponses (e.g., "Communications are good in my work group" or "Majority and
minority personnel work together well") were considered process variables
unless they required the respondent to report subjective feelings.

Process Variables

The 10 process variables were:

1. *Support:* The degree to which supervisors or the organization pro-
vide for the personal needs or well-being of individuals. Three subcate-
gories of this factor were distinguishable:

- *personal support:* a willingness to listen to and help indi-
  viduals with personal problems and to take their needs into
  account in making personnel decisions. *Example:* "I can talk
  to my boss about personal problems."

- *organizational services:* the adequacy or inadequacy of
  organization-provided facilities and services, such as recrea-
  tion, housing, transport, and banking, relating to employees'
  personal needs. *Example:* "This installation has no recrea-
  tional facilities."

- *hygiene:* physical aspects of the work environment (lighting,
  sanitation, noise, vibration, dirt, caustic chemicals, un-
  safe equipment) that affect employees' health or physiological
  security. *Example:* "I am exposed to toxic gases on my job."

2. *Personnel Development:* (1) the degree to which supervisors or the
organization formally train or informally coach their subordinates to improve

their knowledge, skills, or job performance; encourage, counsel, or help subordinates to advance in their careers; or make education and personal development opportunities available to them; (2) the opportunity subordinates have to use their skills or training in their present jobs; and (3) the extent to which they feel competent and adequately prepared to do the tasks they are assigned. *Examples:* "My boss seldom shows me how to improve my job performance." "I receive adequate training to be able to do my job." "My job fails to make full use of my talents, skills and training."

3. *Teamwork:* the degree to which co-workers work well together. This variable factor includes three distinguishable subcategories:

- *social interaction:* whether co-workers act in friendly, respectful ways toward one another, interact socially voluntarily within and outside the work place, and maintain amicable racial and intragroup relations. *Examples:* "Majority and minority personnel work together well in this unit." "My work group seldom gets together socially outside working hours."

- *work facilitation:* whether people cooperate to help one another or other groups to accomplish tasks, as opposed to competing, sabotaging one another, withholding information or otherwise conflicting in jobs which require group effort. *Example:* "My unit is unwilling to help other units when they need a hand." Supervisor or peer conflict resolution activities were also considered work facilitation. *Examples:* "My supervisor encourages members of our work group to work together as a team." "Conflicts in this organization are openly dealt with and resolved."

- *group cohesiveness:* whether supervisors or work group members act to create feelings of group identity, such as through the development of a symbol (e.g., insignia, mascots, berets) for the group, or competing with other groups in ways that develop team spirit without detracting from organizational performance (e.g., athletics). *Example:* "We have a unit insignia that sets us apart from other units."

4. *Communications Clarity:* the degree to which people feel they are "in the know"; that supervisors' rules, standards or procedures and the organization's goals are clear and understandable; that communication channels are open up and down the chain of command; and that effective horizontal and vertical communication takes place. *Examples:* "I get the information I need to be able to do my job." "I know exactly what is expected of me in my job." "Communications are poor between my unit and other work groups in this organization." "My boss has an open door policy."

5. *Order and Organization:* the degree to which individuals perceive their work group or agency to be well organized, the task planning and coordination efficient and effective, and the logistic support (e.g., necessary equipment, resources, and support services) timely and adequate. *Examples:* "My work group is poorly organized." "The missions this company undertakes are carefully planned so nothing goes wrong." "I seldom get the tools and equipment I need to do my job."

30

6. *Standards:* the degree to which supervisors or the organization express concern with or set high standards, challenging specific objectives for task performance, personal conduct, or the maintenance of physical facilities and equipment. *Examples:* My supervisor sets high standards for work done in my unit." "There is continual pressure to improve performance in this organization." "I have specific objectives for my performance in my job this year."

7. *Job Design:* the degree to which the job itself seems relevant or important, or provides meaningful activities, challenges, variety, identity with a completed whole, or intrinsic feedback or rewards to individuals on how well they are doing (cf. Hackman & Oldham, 1974). *Examples:* "We spend a lot of time sitting around doing nothing, without any meaningful work." "I get to do many different tasks in this job." "My job gives me something to show for my efforts when my work is done." "My job allows me to set my own pace."

8. *Responsibility (Autonomy and Influence):* the degree to which people feel they can make job-related decisions without having to get the approval of superiors, are in control of their own situations, and have influence within their work groups or the organization, especially with those of higher or equivalent status. "Over control" and "conformity" items concerning organizational aspects which limit members' responsibility were also classified for this factor. *Examples:* "I can plan my work without having to check with my boss." "This organization has a lot of Mickey Mouse rules and red tape which get in the way of getting the job done." "I can influence decisions that affect my working conditions."

9. *Feedback and Rewards:* the degree to which individuals get feedback from their supervisors, co-workers, or organization on how well they are doing their jobs, and the extent to which they feel good task performance is rewarded (e.g., by praise, promotions, compensation, favors, time off, special awards, and commendations). *Examples:* "My supervisor seldom gives me feedback on how well I am doing my job." "People who do a good job get rewarded in this organization." "If someone doesn't do his job, this work group lets him hear about it."

10. *Justice:* the degree to which people in the organization feel job assignments, training opportunities, promotions, and other rewards, and disciplinary actions and punishments are handled on a fair and equal basis, without favoritism or discrimination because of race, sex, or other individual characteristics. *Examples:* "Minorities get the same opportunities for advancement as majority personnel in this organization." "Disciplinary actions are not handled fairly here." "My supervisor does not 'play favorites' in deciding who gets which job."

Outcome Variables

Items and variables relating to the two outcome variable categories, task performance and satisfaction, were also identified in many instruments.

1. *Performance:* the degree to which the organization achieves productivity, efficiency, goal or mission accomplishment outcomes as a result of managerial job design, peer interaction, or organizational practices.

Examples: "My unit usually accomplishes its mission objectives." "This company's score on the last ARTEP inspection was ____."

2. *Satisfaction:* the degree to which members feel positive about themselves, their organization, supervisors, job, co-workers (affective evaluations of motivation, satisfaction, or morale). Satisfaction may also be evidenced indirectly in measurable organizational outcomes such as turnover or retention rates, grievances, health, or other results related to feelings of satisfaction. *Examples:* "I like my job." "Everything considered, military service offers me a good career." "I do not intend to reenlist." "First term retention rates in this company were ____ percent."

Table 3 summarizes process and outcome variables and organization components found in the instruments reviewed.

<u>Content Analysis of Instruments</u>

Thirty-one of the 38 instruments containing over 4,000 items were reviewed in an item-by-item content analysis (seven instruments were dropped because of insufficient or partial data). This approach was chosen because an initial analysis of factors and scales proved inadequate. Factors frequently appeared to be misnamed when the individual items were examined; the use of varimax rotation procedures in the factor analysis tended to limit the number of factors generated (Stern, 1970), without adding anything to their comprehensibility. A priori scales covered such a wide range of variables and nomenclatures that direct comparisons across instruments proved impossible.

Item-by-item analysis also permitted an analysis of the instruments by the organizational component involved. The first attempt at an item-by-item analysis was guided by the most frequently mentioned factors and subscales. These were expanded or contracted as a result of trying to allocate individual items. A fairly stable set of 23 variables emerged, 20 of which were process variables and 3 of which were outcome variables. Twenty-six instruments were analyzed using this framework. A smaller framework containing the 10 process and 2 outcome variables discussed above was then derived from the larger framework by grouping redundant variables. While the reduction in the number of variables decreased the discriminating power of the content analysis of the instruments, it produced a more parsimonious framework. All instruments reviewed were recoded using this variable framework.

As can be seen from Table 3, only the presence or absence of a variable is indicated. This provides some control over the number of items in a questionnaire: Longer instruments dominate only to the extent to which they have a broader coverage. The Table 3 summaries of the individual instruments provide a coarse-grained analysis permitting visual comparison of components and variable dimensions of instruments reviewed. Some confusion in assigning items to particular cells was unavoidable, due to the overlap of variables and the multi-dimensionality and ambiguity of many items.

32

Classifications are not mutually exclusive. A statement such as, "I can talk to my boss about decisions affecting my job," can be classified under both *Support* and *Communications Clarity*. Similarly, an item can be classified under more than one organizational component when it is unclear whether the item refers to the respondent's job, work group, or organization. In cases where the actual survey instrument was not available, judgments had to be made from partial reports in published descriptions; in such instances, the names of variable scales or factors reported were used rather than the actual items.

Instrument by Organizational Component. Military instruments tended to focus on the role of the superior in determining a unit's organizational climate, with markedly fewer items concerned with peer group and subordinate roles in determining organizational climate. Job-related questions also appear to be relatively underrepresented.

The same general distribution of items also exists for civilian instruments, but the emphasis on the supervisor component is less pronounced.

Instrument by Process Variable. Military instruments emphasized Support, Personnel Development, and Feedback and Reward variables, and contained decidedly fewer items relating to Job Design, Communication Clarity, Order and Organization, and Justice variables.

Civilian instruments focused more on Responsibility and Teamwork variables, and contained fewer items related to Communication Clarity, Job Design, and Justice. The consistent underemphasis of Communication Clarity may in part be an artifact of the way the variables were constructed: Communication as a process was divided between Performance Feedback, Work Facilitation, and general Communication Clarity. The underemphasis of the Order and Organization variable is less readily interpretable.

The overall pattern for the military instruments suggests a focus on bureaucratic organizations emphasizing support, training, and discipline, whereas civilian instruments put more stress on Teamwork and individual Responsibility variables.

The single greatest difference between military and civilian instruments is in the frequency of the Justice variable. Its predominance in the military instruments is probably due to the racial composition of the military services and the amount of discretionary authority possessed by NCOs and officers with respect to lower level enlisted men.

Table 4 summarizes the reliability statistics reported for the instruments reviewed. Most of the instruments were tested across sizable populations, with the military instruments in particular having large data bases. As the table indicates, only 15 out of 37 instruments provide statistical information on the internal consistency reliabilities. Where several variable scale reliabilities or a range of reliabilities attained with different administrations of the instrument were reported, the figures given in Table 4 are the mean scores. It can be seen that reliabilities for work environment and organizational climate questionnaires range from .24 to .99, with a mean of .72 for scale reliabilities

33

Table 4

Reliability Statistics for Instruments Reviewed

Instrument	Sample size	Reliability		
		Scale	Test-retest	Factor
1. General Organizational Questionnaire	System wide data	NR	NR	NR
2. Human Resources Management Survey	System wide data	NR	NR	NR
3. Organizational Development Survey	NR	NR	NR	NR
4. Leadership Evaluation and Analysis Program	500 from 18 separate commands in one installation	Women Marine split-half r=.68 CMD Preparedness split-half r=.93 CMD Equality split-half r=.90 Program Evaluation split-half r=.83	.67 .64 .62 --	Four factors identified
5. Occupational Attitude Inventory	9,000	NR	NR	35 factors identified
6. Leader Match	NR	NR	NR	NR
7. Work Environment Questionnaire (Seneca)	NR	NR	NR	NR

34

Table 4 (Continued)

| Instrument | Sample size | Reliability | | Factor |
		Scale	Test-retest	
8. Measure of Morale	179 soldiers from two companies & of various ranks	NR	NR	NR
9. Military Leadership Survey	1,820 soldiers from sample of 10,000; various ranks	a for four factor= .787-.868	NR	Four factors identified
10. Work Environment Questionnaire (Augsberg)	Various technical specialists from a number of similar units; N varied from 25 to 120	NR	Test-retest of 25 at one-week interval: r=.6-.8	10 factor scales (some items formed five scales not included in factor analysis)
11. Work Environment Questionnaire (32nd AADCOM)	NR	NR	NR	NR
12. Fort Ord: Installation Wide Survey	NR	NR	NR	NR
13. Organizational Survey (USAREUR)	NR	NR	NR	16 factors identified
14. Measure of Military Attitudes	NR	r=.47-.52 factor scales	NR	16 factors • 3 discipline subfactors • 2 leadership subfactors

35

Table 4 (Continued)

Instrument	Sample size	Reliability Scale	Reliability Test-retest	Factor
15. Military Company Environment Inventory	NR	NR	NR	7 factors identified
16. Air Force Organizational Assessment Package	NR	NR	NR	NR
17. Alderfer	814 from 7 sites	Internal consistency of factor scales: r=.79-.88	NR	7 factors identified
18. Business Organization Climate Index	120 managers from 100 sites	Brogden-Clemens internal consistency index: > .60 with only 3/24 exceptions	Analysis of variance: only one scale significantly different	NR
19. Pritchard & Campbell	76 managers from 2 sites	Spearman-Brown est. of internal consistency: .66-.85	NR	7 factors identified
20. Agency Climate Questionnaire	143 managers from 2 sites; 125 managers & 385 others from 69 agencies in one company	Internal consistency of factor scales: r=.52-.90	NR	6 factors identified

Table 4 (Continued)

| Instrument | Sample size | Reliability | | Factor |
		Scale	Test-retest	
21. Work Climate	373 priests	Internal consistency of factor scales >.86	NR	4 factors identified
22. Litwin & Stringer	347 from 20 sites	Cronbach's α=.63-.85	NR	6 factors identified
23. Organizational Description Questionnaire	290 personnel from one site	Kuder-Richardson for 16 of 19 scales >.53 3 remaining scales KR=.28, .48, .48 Cross-validation on 91 of original sample gave KR > .59 for 18 of 19 scales	NR	NR
24. Organizational Climate Description Questionnaire	1,151 teachers & principals from 71 elementary schools	NR	NR	8 factors identified with three factors from second order factor analysis
25. Michigan Organizational Assessment Package	NR	NR	NR	NR
26. Profile of Organizational Characteristics	Various sample used but no specific details	Split-half reliabilities Spearman-Brown .81-.99	NR	One factor identified

Table 4 (Continued)

Instrument	Sample size	Reliability Scale	Reliability Test-retest	Factor
27. Survey of Organizations	1,450 work groups	Internal consistency $\alpha = .58-.80$	NR	6 factors identified
28. Motivation and Working Relations of Scientists & Engineers Questionnaire	1,200- across all sites Median response = 94%	NR	$r=.97$ (group means); median $r=.62$ (individual items) (N=52 for retest)	NR
29. College Characteristics Index	1,076 students from 23 colleges (actual sample sizes vary ∴ of huge data base (>100,000) for this instrument)	Item discrimination index: only 1% of col. below acceptable limit of +.20. Grand mean .52 $K=R_{20}=.66$	86% agreement for sub-sample of 100 students from 1 school over 1 month	11 factors developed from scales & 2 second-order factors
30. Ward Atmosphere Scale	425 patients, 224 staff	Item sub-scale $r=.42-.53$; internal consistency $KR_{20}=.59-.78$	$r=.68-.83$	8 factors similar to a priori scale
31. Job Description Inventory	NR	Split-half $r=.70$	NR	10 factors identified
32. Work Environment Scale	NR	NR	NR	10 factors identified
33. Employee Motivation and Morale	30-70 in 90 work groups: TVA, electronics companies	NR	$r=.76-.87$	5 factors identified

Table 4 (Continued)

Instrument	Sample size	Scale	Reliability Test-retest	Factor
34. Work Analysis Questionnaire	NR	NR	NR	NR
35. Organizational Inventory	NR	NR	NR	NR
36. Performance Audit	NR	NR	NR	NR
37. Encounter Group Leader Behavior Checklist	NR	NR	NR	4 factors identified
38. Survey of Management Climate	NR	NR	NR	NR

and .69 for test-retest reliabilities. Reliability of .70 is probably a realistic standard for instruments of this type.

Retest reliabilities were only available for 6 instruments. Of these, only one instrument, Patchen's Employee Motivation and Morale Test, had a test-retest reliability at a highly acceptable level (r = .80), although the remaining five had reliabilities in excess of .60.

Some 20 out of 37 instruments used some form of factor analysis to establish subscales or dimensions. Factor analysis is essentially a statistical technique for clustering items and variables which correlate with one another. It can be used to identify or confirm the existence of variable scales in a large number of unrelated items, summarize data parsimoniously, and can assure that such scales have high internal consistency reliability but the method has a number of methodological limitations. First, items which do not sensibly relate to one another may statistically factor together, causing problems of factor interpretation and labeling (e.g., items relating to discipline, supervisor support, standards and respondent rank, leading to a "lower-enlisted-discipline-standards-support" factor). Factors of this type cannot be meaningfully interpreted and have little utility as a basis for organizational development interventions. Second, to be valid, factor analyses require large numbers of items (30 items per variable) and large samples (10 subjects per item or, for example, 1,800 subjects for a six-variable instrument (Nunnally, 1967)). In general, factor analysis is best used to test the existence of hypothesized factors rather than to develop instruments, as in "shotgun empiricism" approaches. Factor reliabilities are reported in terms of scale reliability correlation coefficients. Table 4 summarizes the factor data available for instruments reviewed in the present study. Table 5 summarizes this data by work environment variable and performance and satisfaction outcomes. While some studies report other statistical tests (t statistics, analysis of variance, and Chi-square or other nonparametric analyses), only correlation coefficients (absolute values) are reported because they provide the only comparable statistics reported for all instruments. The overall mean of these statistics provides an estimate of the state of the art in this field (following the "meta-analysis" assumptions advanced by Glass, 1976, and Light and Smith, 1971, for accumulating evidence from a number of studies in a field despite differences in their methodologies and dependent variables). Where a range of r values for a given instrument or variable were reported, the mean[2] was used. Some studies reported only significant correlation findings, so the figures in Table 5 probably represent the mean maximum concurrent and predictive validity levels achievable with these instruments. Again, it should be cautioned that the findings summarized are based on available data only; other findings may exist.

Table 5 also indicates these variable dimensions which are most likely to relate to significant organizational outcomes, and by implication should

---

[2]Mean r values were calculated by summing the squares of all r values reported (Σr^2), finding the mean of these squared values ($\Sigma r^2/n$) and then taking the square root of this value ($\sqrt{\Sigma r^2/n}$).

receive highest priority in the design of work environment questionnaires and in organizational effectiveness interventions. The most important dimensions in military organizations appear to be:

		Mean r with performance outcomes	Mean r with satisfaction outcomes	Total mean r
1.	Teamwork	.33	.36	.35
2.	Support	.33	.29	.31
3.	Order and Organization	.30	.32	.31
4.	Communications Clarity	.18	.38	.30
5.	Feedback Rewards	.26	.33	.30

Justice variables (r = .39 with satisfaction outcomes), on the basis of one study, may also be an important dimension in military organizations.

By contrast, the most important variable dimensions in civilian organizations in predicting organizational performance and satisfaction outcomes are:

		Mean r with performance outcomes	Mean r with satisfaction outcomes	Total mean r
1.	Communications Clarity	.50	--	.50
2.	Standards	.42	--	.42
3.	Teamwork	.39	.41	.40
4.	Job Design	.31	.36	.34
5.	Feedback Rewards	.33	--	.33

Military organizations' results appear somewhat more dependent on structural and support variables, while civilian organizational outcomes are more affected by standards and job design variables. Teamwork, communications, and feedback recognition are critical to organizational effectiveness in both types of organizations. Satisfaction outcomes are marginally better predicted (by organizational variables) than performance outcomes. Prediction of performance dimensions is significantly better in civilian settings (μr = .38) than in military organizations (μr = .23), perhaps because performance outcome variables in civilian organizations (e.g., sales, profits, and earnings) are better defined and have been studied more intensively. Conversely, prediction of satisfaction outcomes is better in military settings (μr = .34) than in civilian organizations (μr = .27), perhaps for the same reason: Military organizations find it easier to measure satisfaction indices (retention rates and disciplinary actions) and place more emphasis on these outcomes.

In balance, the work environment and organizational climate status of validity studies may not be as gloomy as much of the literature on these measures maintains.

The mean level of validity reporting these statistics for all studies is .33 (10 percent of the observed variance) identical to the maximum

41

Table 5

Criterion Validity Statistics for Variable Dimensions in Instruments Reviewed

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
1. Support						
Military						
Navy REFTRA battle scores[1]						
- integration of men & mission						
- human resource emphasis	.10					
- peer support	.03					
- supervisory support	-.04					
	-.15	-.06				
Navy aircraft accidents[12]						
- alternatives to alcohol	|-.38|					
Navy merit ratings[13c]						
- human resources primacy	.18					
- supervisory support	.41					
- peer support	.60	.43	.33			
Navy NJP rates/100 enlisted men[3]						
- human resource emphasis				-.29		
- supervisory support				-.42		
- peer support				-.21		
- integration of men & mission				-.32	|-.32|	
Navy sick calls (incl. lab tests, pharmacy units dispensed)[13a]						
- human resource primacy				-.13		
- supervisory support				.05		
- peer support				-.16	|-.12|	
Navy retention rates[13b]						
- human resource primacy				.36		
- supervisory support				.37		
- peer support				.34	.36	.29

An explanation of columns a, b, and c is given at the end of the table.

42

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
1. Support (continued)	<u>Nonmilitary</u> ● Scientific contributions (papers, patents, ratings)[4] – supervisory human relations emphasis						
	−.35					
	● Encounter group yield (positive change, learning vs. negative change, casualties) – caring						
	.60					

	● Business return on capital[16]
	  (a) concurrent
	  – human resources primacy
	  – managerial support
	  – peer support						

	.75					
	.54					
	.75					

	(b) year one
	  – human resources primacy
	  – managerial support
	  – peer support						

	.46					
	.19					
	.38					
				<u>Nonmilitary</u> ● Disturbed behavior (mental patients)[10] – support, spontaneity		
				−.12		

43

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c

1. Support (continued)	(c) year two
	  - human resources primacy
	  - managerial support
	  - peer support
		.36
		
		.02
		.27
			
			.47
				
				.39			

	Overall mean $|r|$ = .36				Overall mean $|r|$ = .22		

2. Personnel Development	Military
	
	Nonmilitary
	● Encounter group yield
	  - emotional stimulation
		
		.24
					Military
					● Air Force re-enlistment rates[9]
					  - use of talents & training
					
					Nonmilitary
					● Disturbed behavior[10]
					  - practical orientation
					  - personal problem emphasis
						
						.21
						
						-.29
						-.26
							
							-.26	

	Overall mean $|r|$ = .24				Overall mean $|r|$ = .24		

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
3. Teamwork	**Military**			**Military**		
	● Navy REFTRA battle scores[1]			● Army[2]		
	– work group readiness .39			(a) race disturbances		
	– work facilitation .32			– group cohesiveness |–.16|		
	– peer teamwork .25			(b) dissent		
	– peer problem solving .20			– group cohesiveness |–.11|		
	– supervisory teamwork .14			(c) destruction, sabotage		
	– work group coordination .11			– group cohesiveness |–.12|		
	– supervisory work facilitation .04	.26		(d) participation in drives		
				– group cohesiveness .25	.17	
	● Navy aviation accidents[12]			● Navy NJP rates/100 enlisted men[3]		
	– group credit –.44			– supervisory teamwork –.41		
	– encouraged to work as team –.37			– supervisory work facilitation –.40		
	– stress team goals –.37	|–.39|		– peer teamwork –.38		
				– peer work facilitation –.45		
	● Navy merit ratings[13c]			– peer problem solving –.35		
	– group process .40			– work group coordination –.38		
	– supervisor work facilitation .26			– work group readiness –.28	|–.38|	
	– supervisor inter-action facilitation .4ʋ					
	– peer work facilitation .31					
	– peer interaction facilitation .41	.37				

45

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
3. Teamwork (continued)	• Army computer operator[11]			• Marine[6]		
	(a) work behaviors			(a) unauthorized absences		
	- superior consideration .17			- command cohesion -.42		
	- group cohesion .06			(b) career retention		
	(b) time to complete task			- command cohesion .47	.45	
	- superior consideration .13					
	- group cohesion -.05	.11	.33	• Navy sick calls[13a]		
				- group process -.30		
				- supervisor work facilitation -.06		
				- supervisor inter-action facilitation -.04		
				- peer work facilitation -.39		
				- peer interaction facilitation -.35	[-.27]	
				• Navy retention rates[13b]		
				- group process .51		
				- supervisor work facilitation .31		
				- supervisor inter-action facilitation .37		
				- peer work facilitation .44		
				- peer interaction facilitation .49	.43	.36

46

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables				Satisfaction Outcome Variables		
		a	b	c		a	b	c
3. Teamwork (continued)	**Nonmilitary**				**Nonmilitary**			
	● Scientific contributions[4]				● Agency			
	– coordination	.25			(a) turnover			
					– identity with organization	[-.23]		
	● Business performance (growth in sales, return on sales, growth in earnings)				(b) display company logo			
	– smoothing conflicts	[-.40]			– identity with organization	.24		
	● Growth in sales[14]				(c) volunteer for company committees			
	– team spirit	.52			– identity with organization	.75	.41	
	● Business return on capital[5]							
	(a) concurrent							
	– manager work facilitation	.60						
	– manager interaction facilitation	.67						
	– peer work facilitation	-.03						
	– peer interaction facilitation	.33						
	(b) year one							
	– manager work facilitation	.38						
	– manager interaction facilitation	.54						
	– peer work facilitation	-.18						
	– peer interaction facilitation	.21						

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
3. Teamwork (continued)	(c) year two					
	- manager work facilitation .05					
	- manager interaction facilitation .24					
	- peer work facilitation -.28					
	- peer interaction facilitation .19	.34	.39			
	Overall mean |r| = .36			Overall mean |r| = .35		
4. Communications Clarity	Military			Military		
	● Navy REFTRA battle scores[1]			● Navy NJP rates[3]		
	- communications flow .11			- communications flow |-.41|		
	● Navy merit ratings[13c]			● Navy sick calls[13a]		
	- communications flow .23		.18	- communications flow |-.24|		
				● Navy retention rates[13b]		
	Nonmilitary			- communications flow .50		.38
	● Scientific contributions[4]			Nonmilitary		
	- communications .34					

48

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
4. Communications Clarity (continued)	● Encounter group yield - meaning attribution					
	.70					
	● Business return on capital[15] (a) concurrent - communications flow					
	.23					
	(b) year one - communications flow					
	.60					
	(c) year two - communications flow					
	-.01	.37	.50			.35
	Overall mean |r| = .37					
				Overall mean |r| = .35		
5. Order & Organization	Military ● Navy aviation accidents[12] - help you schedule work			Military ● Marine[6] (a) unauthorized absence - command preparedness		
	|-.37|			|-.24|		
	● Army computer operators[11] (a) work behaviors - superior structure			- command efficiency		
	.06			|-.16|		

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables	a	b	c	Satisfaction Outcome Variables	a	b	c

5. Order & Organization (continued)	(b) time to complete task
	  – superior structure
		.14			(b) career retention
					  – command preparedness
						.29		

	• Navy merit ratings – decision making	.34	.11		– command efficiency	.29	.25	
				.30	• Navy sick calls – decision making	–.15		
	Nonmilitary				• Navy retention rates – decision making	.47		.32
	• Scientific contribution[4] – supervisory planning & scheduling	–.30			**Nonmilitary**			

	• Business performance[5]
	  – awareness of environment
	  – strategic planning
		.33
		.39
			.36		• Disturbed behavior[10]
					  – order and organization
					  – program clarity
						–.15
						–.18
							–.17	

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
5. Order & Organization (continued)						
• Encounter group yield[15] – executive function	.70					
• Growth in sales[14] – clarity	.40					
• Business return on capital (a) concurrent – decision making	.48					
(b) year one – decision making	.25					
(c) year two – decision making	.20	.32	.40			
Overall mean |r| = .35 (Satisfaction) Overall mean |r| = .27						
6. Standards						
Military • Navy REPTRA battle scores[1] – goal emphasis – work group discipline	-.04 -.08	-.06				
Military • Navy NJP rates – supervisory goal emphasis – work group discipline				-.26 -.36	|-.31|	

Table 5 (Continued)

Performance Outcome Variables

Organizational Process Variable	Performance Outcome Variables	a	b	c
6. Standards (continued)	● Army computer operator[1]			
	(a) work behaviors			
	– importance of performance aspect	.05		
	– group performance orientation	.08		
	– performance standards	.18	.14	
	(b) time to complete task			
	– importance of performance aspect	.05		
	– group performance orientation	.02		
	– performance standards	.26	.35	
	● Navy merit ratings			
	– supervisory goal emphasis	.33		
	– peer goal emphasis	.36		.21

Satisfaction Outcome Variables

Satisfaction Outcome Variables	a	b	c
● Navy sick calls			
– supervisory goal emphasis	.07		
– peer goal emphasis	[-.33]	.23	
● Navy retention rates			
– supervisory goal emphasis	.35		
– peer goal emphasis	.50	.43	.34

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
6. Standards (continued)	**Nonmilitary**			**Nonmilitary**		
	● Scientific contributions[4]					
	– supervisory goal setting	.28				
	– time pressure	.41	.35			
	● Business performance[5]					
	– clarity	.45				
	– commitment	.56	.51			
	● Sales					
	(a) growth					
	– standards	.34				
	(b) return					
	– standards	.40	.36			
	● Business return on capital					
	(a) concurrent					
	– manager goal emphasis	.54				
	– peer goal emphasis	.66				
	(b) year one					
	– manager goal emphasis	.19				
	– peer goal emphasis	.50				

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables				Satisfaction Outcome Variables		
		a	b	c	a	b	c

6. Standards (continued)	(c) year two
	  - manager goal emphasis
	  - peer goal emphasis
		.02
		.20
			.42	.42			

	Overall mean |r| = .33						

7. Job Design	Military
	● Army computer operators[11]
	  (a) work behaviors
	    - job importance
	    - job autonomy
	    - job activity
	  (b) time to complete task
	    - job importance
	    - job autonomy
	    - job activity
		
		.01
		.14
		.17
		
		.02
		.12
		.07
			
			.11
				
				.11			

	Military ● Air Force reenlistments[9] - job interest				.22		.22
	Overall mean |r| = .34						

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
7. Job Design (continued)	**Nonmilitary**			**Nonmilitary**		
	● Scientific contributions — diversity — job motivation .40			● Job (a) attendance — job motivation -.24		
				(b) grievances — job motivation .26		
				(c) work accidents — job motivation -.27		
	● Productive efficiency (costs, supplies, maintenance, scrap, schedules met, quality)[7] — job motivation .19		.31	(d) psychological symptoms (nervousness, anxiety, depression) — job motivation -.56	-.36	
	Overall mean |r| = .23			Overall mean |r| = .30		
8. Responsibility	**Military**			**Military**		
	● Navy aviation accidents[12] — nonsupervisory influence -.39			● Navy sick calls[13a] — lower level influence -.39		
	● Army computer operator[11] (a) work behaviors — job responsibility .09			● Navy retention rates[13b] — lower level influence .53		

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
8. Responsibility (continued)						
(b) time to complete task - job responsibility	-.04					
• Navy merit ratings[13c] - lower level influence	.16	.06				
Nonmilitary						
• Scientific contributions[4] - freedom, autonomy	.35					
• Business performance[5] - influence	.49					
• Return on sales[14] - conformity	-.50		-.20			
• Growth in earnings[14] - responsibility	.34					
• Innovations (suggestions,[7] superior ratings) - work innovation	.29		.38			
Nonmilitary • Disturbed behavior[6] - autonomy - staff control				[-.24 -.01]	.17	.46
	Overall mean |r| = .23			Overall mean |r| = .35		

56

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables				Satisfaction Outcome Variables		
		a	b	c		a	b	c
9. Feedback Rewards	**Military**				**Military**			
	• Navy aviation accidents[11]				• Navy sick calls[13a]			
	- supervisor gives group credit	.44			- motivation	-.25		
	• Army unit[7]				• Navy retention rates[13b]			
	(a) effectiveness				- motivation	.39		
	- motivation	.28						
	(b) inspection scores							
	- motivation	.25	.27					
	• Army computer operators[11]							
	(a) work behaviors							
	- feedback on activities	.18						
	- feedback from sources	.12						
	- feedback on utilization	.17						
	(b) time to complete task							
	- feedback on activities	-.08						
	- feedback from sources	.04						
	- feedback on utilization	.16	.13					

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
9. Feedback Rewards (continued)						
● Navy merit ratings[13c]						
– motivation	-.01					.33
Nonmilitary						
● Scientific contributions[4]						
– supervisory evaluation	.33		.26			
Overall mean |r| = .30			.33	Nonmilitary		
				Overall mean |r| = .33		
10. Justice						
Military				Military		
				● Marine		
				(a) retention rates		
				– command equality	.38	
				– minority discrimination	[-.75]	
				– majority discrimination	[-.35]	
				– intergroup climate	[-.24]	
				– justice	[-.20]	[-.44]

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
10. Justice (continued)				(b) unauthorized absence - command equality .33 - minority discrimination .33 - majority discrimination .24 - intergroup climate .11 - justice .51		.33	.39
Composite Scores	Military ● Army company performance:8 firing scores, physical training, test scores (31% of items) .40+ Nonmilitary ● Business performance5 - growth in sales .49 - return on sales .56 - growth in earnings 0			Military ● Army sick calls8 - 29% of items .40+ Nonmilitary ● Business15 - turnover 0 - absence rates -.38 - accident rates -.15 - sick days -.16 - grievances -.53	.31	

59

Table 5 (Continued)

Organizational Process Variable	Performance Outcome Variables			Satisfaction Outcome Variables		
	a	b	c	a	b	c
Composite Scores (continued)	● Business efficiency[15] – labor costs −.29 – overtime costs −.15 – variable expenses −.22 – expenses/sales 0 – expenses/manpower −.35	.24				
	● Business return on capital[15] (year one)	.87+				
	● Mental patients[9] – personal development .66 – dropout rate .90 – release rate .79	.79+	.58			
			<u>.58</u>			
	● Disturbed behavior[8]			−.52	|−.52|	
						<u>.43</u>
					<u>.58</u>	

Column a = instrument variable $\underline{r}$ with criterion.

Column b = mean $\underline{r}$ for instrument = $\sqrt{\dfrac{|\Sigma[(+r)^2-(-r)^2]|}{n}}$. If $\Sigma[(+r)^2-(-r)^2]$ is negative, the sign of b is negative (−b).

Column c = mean $\underline{r}$ for all military or civilian instruments for variable category = $\sqrt{\dfrac{|\Sigma[(+r_b)^2-(-r_b)^2]|}{n}}$. If $\Sigma[(+r_b)^2-(-r_b)^2]$ is negative, the sign of c is negative (−c).

Overall mean $\underline{r}$ = mean $\underline{r}$ for all military and civilian instruments for variable category = $\sqrt{\dfrac{|\Sigma[(+r_c)^2-(-r_c)^2]|}{n}}$.

Table 5 (Continued)

References to Instruments

1. Mumford (1976)
   Navy Human Resource Management Survey

2. Borman (1975)
   Army Measure of Morale

3. Crawford & Thomas (1975)
   Navy Human Resource Management Survey

4. Pelz & Andrews (1976)
   Motivation and Working Relations of Scientists & Engineers
       Questionnaire

5. Becklean & Kinkaed (1968)
   McBer Organizational Inventory

6. Affourtit (1977)
   Marine Corps LEAP

7. Patchen (1975)
   Employee Motivation and Morale Instrument

8. Moos (1973)
   Ward Atmosphere Questionnaire

9. Gould (1976)
   Air Force Occupational Attitude Survey

10. Moos (1973)
    Military Company Environment Inventory

11. Turney & Cohen (1976)
    Army Work Environment Questionnaire

12. Klienman (1976)
    Navy Human Resource Management Survey

13a Drexler (August 1973)
    Navy Human Resource Management Survey

13b Drexler (May 1973)
    Navy Human Resource Management Survey

13c Drexler (September 1973)
    Navy Human Resource Management Survey

14. Klemp (1975)
    Litwin-Stringer (McBer) Organization Climate Survey Questionnaire

Table 5 (Continued)

15. Licherman, Yalom, & Miles
    Encounter Group Leader Behavior Checklist

16. Taylor & Bowers (1973)
    Survey of Organizations

Summary: Table 7 Statistics

Performance

		Military	Nonmilitary	Total
1.	Support	.33	.39	.36
2.	Personnel Development	--	.24	.24†
3.	Teamwork	.33	.39	.36
4.	Communications Clarity	.18	.50	.37
5.	Order and Organization	.30	.40	.35
6.	Standards	.21	.42	.33
7.	Job Design	.11	.31	.23
8.	Responsibility	-.20	.38	.23
9.	Feedback Rewards	.26	.33	.30
10.	Justice	--	--	--†
		.23	.38	.31

Satisfaction

		Military	Nonmilitary	Total
1.	Support	.29	.12	.22
2.	Personnel Development	.21	.28	.24
3.	Teamwork	.36	.41	.35
4.	Communications Clarity	.38	--†	.38†
5.	Order and Organization	.32	.17	.27
6.	Standards	.34	--†	.34†
7.	Job Design	.22	.36	.30
8.	Responsibility	.46	.17	.35
9.	Feedback Rewards	.33	--†	.33†
10.	Justice	.39	--†	.39†
		.34	.27	.32

† absent data not averaged.

62

Table 5 (Continued)

Total (μr Performance & Satisfaction

		Military	Nonmilitary	Total
1.	Support	.31	.29	.30
2.	Personnel Development	.21†	.26	.24
3.	Teamwork	.35	.40	.38
4.	Communications Clarity	.30	.50†	.41†
5.	Order and Organization	.31	.31	.31
6.	Standards	.28	.42†	.36†
7.	Job Design	.17	.34	.27
8.	Responsibility	.29	.29	.29
9.	Feedback Rewards	.30	.33†	.32†
10.	Justice	.39†	--†	.39†
		.30	.36	.33

† absent data not averaged.

criterion validity r of .33 (10 percent of observed variance) reported for the much better developed field of psychometric testing (Ghiselli, 1966).[3] These predictive validity statistics for work environment variables exceed those found for pure satisfaction instruments (μr = .14; Vroom, 1964) and provide support for the organizational climate construct.

II. CRITERIA FOR SELECTION/DEVELOPMENT OF A WORK ENVIRONMENT QUESTIONNAIRE

Intervention Utility

Work environment and organization surveys are used in three ways: basic research, organization development interventions, and management information and control system inputs to top management for policy evaluation decisions. Most of the instruments reviewed in this study were designed and primarily used for research. Most of the preceding discussion has concerned their research properties. A number of additional considerations are important if instruments will be used in organization development and evaluation applications. These considerations will be discussed in greater detail in the final report of this project (an implementation manual for work environment questionnaires), but where they bear on instrument design or review criteria, they will be treated briefly here. Intervention utility considerations can be organized in terms of administration, processing, feedback, and evaluation.

Administration

Three considerations of importance here are instrument length and administration time, administration instructions, and resources and facilities required.

Instrument Length and Administration. As discussed above, 100 items and 1 hour appear to be the outside limits for instruments which will be administered to large samples in practical applications. (Many consultants consider 80-item questionnaires too long and would prefer surveys of 20 to 40 items.) Surveys requiring more than an hour risk involving fatigue factors (which may cause instrument rejection responses) and organizational resistance if people are taken away from their regular tasks for too long a time. Most of the instruments reviewed would be considered too long by this criterion.

Administration Instructions. These appear to be critical in gaining instrument acceptance, which in turn is often critical to the success of

---

[3]Mean multiple r criterion validities of .40, -.50, and as high as .87 are reported for the composite scores of some instruments, but as multiple r statistics take maximum advantage of chance and these findings do not appear to have been cross-validated, they should be treated with some skepticism.

the organizational development intervention. Some of the instruments reviewed included administration manuals with procedures for gaining rapport with subjects, motivating them to want to take the survey by explaining its purposes in terms of their interests, and reassuring them about confidentiality and other possibly threatening aspects. Administration instructions must also present clear and understandable "how to do it" mechanics of recording demographic data, reading items, marking responses or transferring data to computer-readable scoring sheets, and returning data and materials to the administrators. Most of the instruments reviewed did not include administration instructions, or provided only very brief (and frequently inadequate) instructions on the instrument cover page.

Resources and Facilities. These should be minimized. Consultants emphasize that the greater the amount of materials and logistics required (pencils, survey item booklet, scoring sheet, ballot box or envelopes for collecting completed instruments), the greater is the chance that something will go wrong. Proctored surveys greatly increase return rates and reduce rejection rates, so scheduling large rooms and getting instructions out to subjects to ensure they show up at the right time and place to take the survey seem unavoidable. Instrument sources in general had little to say about administration resource and material requirements.

Processing

Considerations here include scoring or data input methods, data analysis methods and procedures, resources required, and turnaround times.

Scoring. Many work environment questionnaires appear designed to be hand-scored, an unsatisfactorily slow and cumbersome method for surveys of any length with more than a few subjects. Short, simple instruments designed to be self-scored by participants are practical, however, when aggregation and processing of data on a group basis is not needed. Data in formats which can be easily transferred to computer-readable punched cards or entered directly from computer terminals is somewhat better. It is best to have subjects record responses on computer-readable score sheets that can be read directly into the data processing unit with optical scanning equipment. The usual advice given to instrument designers is to consider how data collected will be scored and analyzed from the very beginning of the design process, and develop an instrument that can be scored in the fastest and most efficient way.

Analysis. As with scoring, many instruments reviewed seemed designed to be analyzed by hand, an alternative no more satisfactory for this function than for reporting data. Computer programs providing at least summary statistics should be designed for instrument analysis concomitantly with the design of the instrument itself. Several computer packages applicable to a variety of instrument formats are now available for this purpose (e.g., the Army's "OE Survey Program," Mikols, 1977).

Resources required. Computer recording and analysis of data require the availability of optical scanning or card reading equipment and a central processing unit with sufficient capacity and flexibility to use the analysis program. Organizations typically handle survey data analysis in one of

three ways: (1) by processing data on site, using their own equipment; (2) by processing data on the organization's main computer when time is available; and (3) by mailing data to central processing facilities maintained by the organization or by contractors.

Few organizations have the resources to use the first alternative. The Air Force experimented with having subjects record survey responses on small cards in electrically conductive ink which could be read and processed immediately using equipment manufactured by Monroe, but for a variety of technical reasons, this method did not work. The Army uses a standard analysis program which can be run on management information system office (MISO) computers available at most Army installations. The Navy has all survey data sent to two central processing facilities in Norfolk, Virginia, and San Diego, California. Most industrial organizations contract for data processing with external consulting firms or use their own central computing facilities.

The Army's system appears to be the best because it uses the organization's own equipment and minimized turnaround time. It follows that developers of work environment surveys should design instrument analysis routines to be compatible with their organizations' existing data processing equipment where possible.

Turnaround time. An important factor in considering data analysis alternatives is the turnaround time that elapses from the time a subject completes a work environment questionnaire to the time he receives his feedback. One month is considered the outside limit in survey-guided development interventions. If more time elapses, the data gets stale, particularly in military organizations where frequent personnel rotations can cause significant organizational changes in short periods of time. The use of central processing facilities often results in long turnaround times (survey data is delayed or lost in the mails) and should be avoided where possible for this reason.

Feedback

Feedback creates motivation and direction for change. The degree to which it stimulates organizational change depends on the type and format of data feedback as well as consultant skill and climate receptivity to change. Data considerations include the number of variables, format, salience, and consultant and client training.

Number of Variables. Most studies of human cognition and problem solving report that human beings cannot reason effectively about more than approximately seven variables at any one time (the "magical number 7 plus or minus 2," Miller, 1956), no matter how complex the problem. Newell and Simon (1972) observe that individuals usually consider less than five aspects of a problem and that abstractions from "reality" characteristically involve the comparison of perhaps two symbolic representations at a given time (p. 795). This would suggest that the upper limit on the number of climate variables useful to give a client is about 10. The Army's General Organizational Questionnaire and the Navy's Human Resource Management Questionnaire now present consultants and clients with an inch-thick survey printout containing some 10,000 statistics. Most military consultants and

66

clients consider this format and amount of data entirely too much. Work environment questionnaire feedback should include data reduction routines to limit variables to a manageable number: This objective should be a prime design criterion for instruments in the development phase.

Format. Feedback formats should be simple, visually impactful, present a comparison between an actual and desired condition, and indicate specific directions for change. The latter requirements come from self-directed change research (Kolb & Boyatzis, 1970), which indicates that people and organizations are motivated to change when they personally experience a discrepancy or dissonance between an existing (actual) or desired (ideal) condition. This felt distance between actual and ideal can be conceptualized as the amount of energy or motivation for change. Differences too small and too large are less motivating than moderate discrepancies. Effective work environment instruments provide feedback data in a format which makes client recipients personally feel an actual-ideal discrepancy which motivates them to constructive action and which provides them with some direction (i.e., suggests specific action steps they can take). In simplest terms, this change equation can be summarized as:

Change results when "A + B + C ≤ X," where:

A = dissatisfaction with an existing condition (i.e., an "actual" WE variable score)

B = clarity about a desired condition or objective (i.e., "ideal" WE variable score)

C = a way to start; at least one specific action step to begin to close the actual-ideal discrepancy

X = cost of change (in terms of time, money, personal risk, etc.)

If any of these elements is neglected in the change process or if the cost of change is more than the change is worth, change is unlikely to occur.

It follows that the most effective format for work environment data is one which includes both actual and ideal scores for each variable and makes the motivating discrepancy or direction for change visually clear. Figure 3 illustrates a feedback format which meets these criteria. This feedback format provides consultants and clients with 12 data units (rather than thousands) in the form of a two-point, compound comparison of actual versus ideal scores on each variable which direct recipients' attention to potentially motivating discrepancies.

Little information was available on the feedback formats used with most instruments reviewed; as noted, many instruments had been used for research rather than interventions. Most feedback formats appeared to be tabular summaries of statistics or raw data in computer printout form. Feedback forms for work environment questionnaires to be used in organizational interventions should emphasize simple visual formats which provide change direction as well as status data.

Figure 3. Example of an "actual-ideal" feedback format.

PROFILE FOR ORGANIZATIONAL CLIMATE SURVEY QUESTIONNAIRE
(SHORT VERSION)
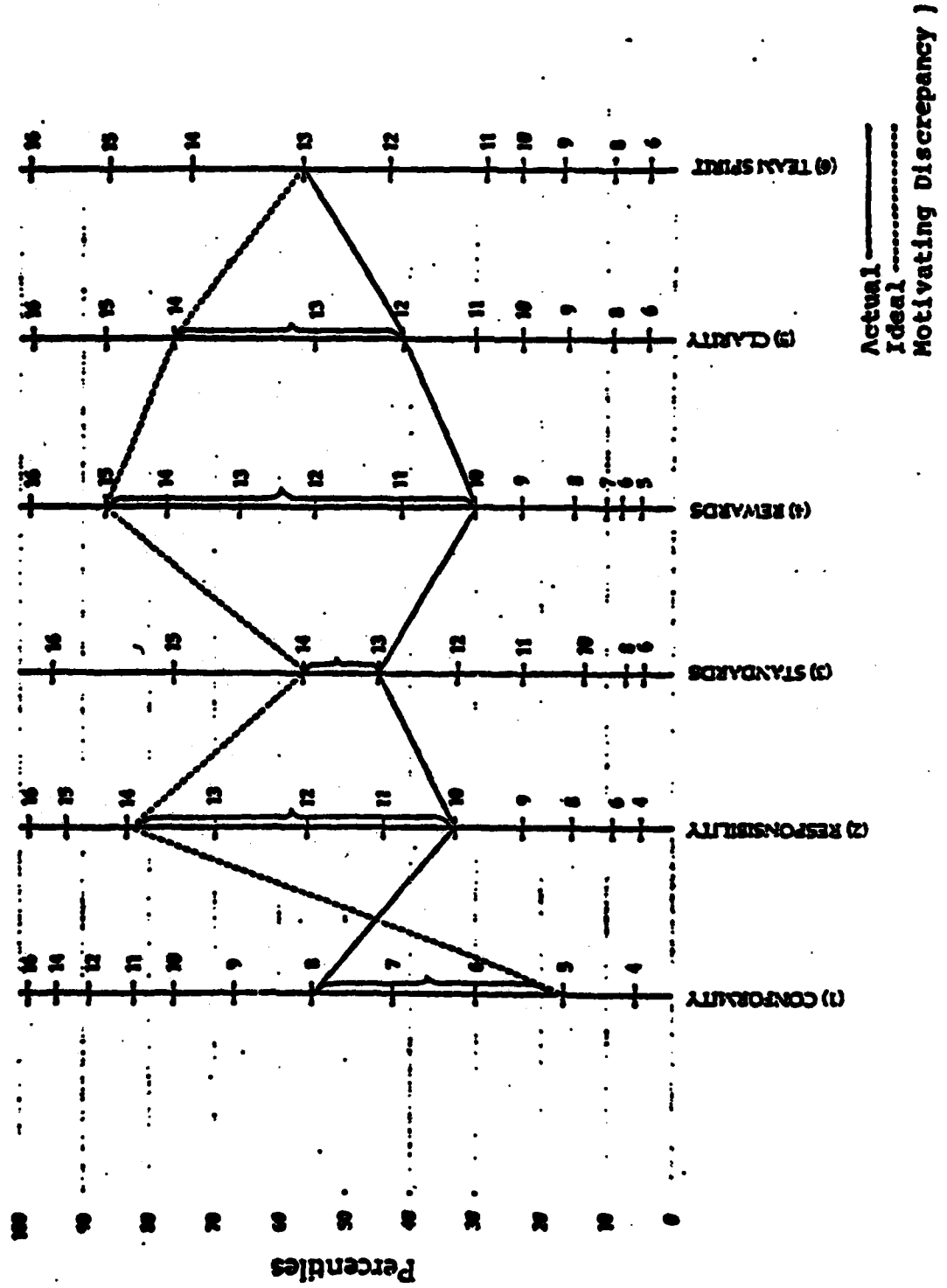
Salience. Relevance and face validity concerns are, if anything, more important in designing data feedback format than in constructing the data collection instrument itself. Recipients must feel the information they receive about themselves, their subordinates, or their organization is real, believable, and of some importance to them. Relevance is helped by providing clients with criterion validity data that enables consultants to show direct links between survey variables and military unit outcomes, and performance results as well as satisfaction indicators. Face validity is aided by providing specific examples ("war story" anecdotes), using military behavioral science versus language in naming variables to illustrate the concrete meaning of each variable dimension, and avoiding normative biases and advocacy of a particular managerial approach in giving data feedback.

As noted above, feedback provided by Likert scales in instruments keyed to a specific format theory of organizational behavior may tend to bias OE programs toward the assumption that there is a one right managerial style or climate for optimum organizational functioning. Contingency systems theory suggests this is unlikely to be true. Experience further suggests that when the theory being "pushed" by the survey is incompatible with military clients' values, they are very likely to reject the data they receive.

Absolute scaling ("1" is "bad," "5" is "good") creates a pressure for "right" answers which can bias survey results. When norm comparisons are made (and sample size is large), supervisors frequently get feedback that shows (on the basis of a .4 variable difference from the mean) that they are, in the words of one E8, "a double asterisk, $p < .01$, statistically significant incompetent military officer." Feedback of this type is both misleading and not particularly conducive to constructive OE efforts. The norms used for such comparisons are often meaningless because they are not disaggregated by type of organization.

Normative bias problems can be avoided by providing actual and ideal scores for variable dimensions and focusing data feedback interpretations and intervention planning on the client's personally felt discrepancies rather than comparison with an abstract norm.

Consultant and client training. A final consideration in designing instruments to facilitate effective feedback in organization intervention efforts is the degree of consultant and client training and expertise required to use the instrument or make sense of feedback received from it. It has been observed that intervention methods which use complex instruments require that a majority of client time and energy be spent in survey-concept workshops learning how to interpret instrument feedback, rather than in problem solving or planning for constructive organizational change, the presumed purpose of the exercise. This "means-ends inversion" suggests that work environment questionnaires and feedback procedures should be designed to be as simple and self-explanatory as possible.

Evaluation

Ideally, work environment survey instruments should be able to be used in formative and summative evaluations of military personnel programs, and to provide management information system data that policymakers can use to

69

identify needs, assess programs, and track trends in organizational performance over time. Reliable and valid instruments can be used in test-retest designs to estimate the effects of organization development programs. Use of work environment questionnaire data in policy analysis (for example, to identify personnel policy changes which could impact favorably on retention, Wissler, 1976), is possible if instrument items are descriptive in nature, and if administrative and confidentiality problems associated with accumulating work environment and performance data on individual units in a central data bank can be solved. For example, if personnel development training opportunities are consistently found to predict junior NCO retention in Army units with different specialties, this data could inform organization-wide training decisions.

The present study suggests that as soon as work environment data are available on a large sample of an organization's members, top management becomes interested in this information and begins to request it on a regular basis. This may interfere with organization development programs if respondents perceive that their data are being used to evaluate them, or if top officials insist that the work environment questionnaire be lengthened or modified to provide data of interest to policymakers a potential obstacle which should be considered in the instrument's design phase.

III. INTERVIEWS

To corroborate the work environment instrument and the literature review, develop a pool of face-valid items, and identify Army unit effectiveness measures, individual and group interviews were conducted with a sample of Army enlisted men at two sites: Fort Riley, Kansas, and Fort Carson, Colorado.

Methodology

Individual interviews were conducted with four junior (E1-4) enlisted personnel and four of their NCO (E5-8) supervisors drawn from infantry, artillery, armor, and support military occupational specialties (MOS), a total of 32 respondents at each site using a critical incident (Flanagan, 1954) or behavioral event (Hertzberg et al., 1959; Dunnette, 1966; Smith & Kendall, 1963; and McClelland, 1976) technique. This method asks respondents to describe in considerable detail specific incidents in which they or their organization were particularly effective or had particularly high morale, incidents when they or their units were particularly low in performance or morale, and to state the criteria by which they evaluated performance, effectiveness, and morale. A distinguishing advantage of this technique is that it elicits descriptive information from which actual behaviors can be reconstructed, rather than effectively-biased interpretations or evaluations of organizational functioning. Interview protocol can be coded empirically, using thematic analysis scoring methods developed by Atkinson and McClelland (Atkinson, 1958), making interviews a quantitative method equal in reliability (r = .8-.9) statistics equaling those of surveys and psychometric tests (Klemp, Munger, & Spencer, 1977). Each

70

individual interview lasted approximately an hour and was transcribed ver-
batim. Figure 4 summarizes the sample design.

Group interviews were conducted with the two subjects previously inter-
viewed individually and four peers drawn from the same four MOS groups at
each site, a total of 96 respondents using a group version of the behavioral
event technique. Respondents were asked to think of the best (highest per-
formance and morale) units they had served in, and the worst (lowest per-
formance and morale) units, state the criteria by which they rated a unit
good or bad, and provide examples of leader behavior, job design, and group
and organizational working relationships and conditions from either cate-
gory in any order. Any statement or description substantiated by a spe-
cific incident or example was recorded on a blackboard in the format illus-
trated in Figure 5. Group interviews lasted an hour to an hour and a half
and were quite animated; the recorded respondent statements were transcribed
verbatim.

Content Analysis of Interview Data

Individual and group transcripts were content-analyzed by a researcher
who had not conducted any of the interviews to identify both organization
process variables and performance and satisfaction outcome variables. The
individual interviews were examined first. A summary statement for each
discrete event described by the interviewee was recorded. These summary
statements were then coded according to the same content schema used for
analyzing the instruments (see Table 3). While the design is straightfor-
ward, single events frequently contained a number of different themes and
were, therefore, recorded more than once. Similarly, in a few instances
almost the whole interview revolved around a single theme. For example,
one enlisted man simply kept repeating in different forms his dissatisfac-
tion with the Army's job assignment and job training procedures. These
factors, plus the general articulateness and cooperativeness of the re-
spondents, explain the variation in the number of scoreable items per in-
terview. Unlike the analysis of the questionnaires, scores of interviews
represented frequencies and not simply the presence or absence of a par-
ticular combination of a process variable and organizational component.
For the purpose of data analysis, each of the individual interviews was
also coded by installation (MOS) and rank of the respondent.

The group interviews were already in a partially summarized form that
allowed a direct coding of the responses according to the same content
schema. Each group interview was coded by installation, (MOS) and the
average rank of the group.

Separate two-way analyses of variance were conducted for the scored
individual and group interview data on respondent rank (EM vs. NCO), repli-
cated within respondent across organizational component (Job vs. Organiza-
tion vs. Work Group vs. Supervisor). The analysis of the individual inter-
view data produced significant main effects for rank on 3 of the 10
process variables. Lower level enlisted men (E1-E4) were significantly
more concerned with support issues ($p < .02$), while NCOs (E5-E9) were sig-
nificantly more concerned with teamwork ($p < .01$) and responsibility

71

Figure 4. Behavioral event and group interview* sample design.

Site A

	Infantry	Artillery	Armor	Support	Site A
NCO Supervisor	2 (4)	2 (4)	2 (4)	2 (4)	Total behavioral event interviews = 16
Enlisted Subordinates	2 (4)	2 (4)	2 (4)	2 (4)	Total group interviews = 48

Site B

	Infantry	Artillery	Armor	Support	Site B
NCO Supervisor	2 (4)	2 (4)	2 (4)	2 (4)	Total behavioral event interviews = 16
Enlisted Subordinates	2 (4)	2 (4)	2 (4)	2 (4)	Total group interviews = 48

*N.B.: Numbers without parentheses are Behavioral Event interviewees; numbers in parentheses are *additional* group interview participants.

72

Figure 5. Group interview data collection format.

Low performance/low morale units	High performance/high morale units
Leader behavior	Leader behavior
Job design	Job design
Work group/organization characteristics and working relations	Work group/organization characteristics and working relations

(p < .002). Such findings are, of course, reasonable in light of the different levels of leadership responsibility of these groups.

Similar findings were not made in the analysis of the group interviews, although the effects were clearly in the same direction. In the group interviews, NCOs dramatically increased the significance attached to communication and clarity and reduced the significance attached to standards. This is most readily seen in Table 6, which gives the rankings of the 10 process variables according to both the rank of the respondent and the interview setting.

An examination of the rank order correlations suggests that it is not simply the interview setting that accounts for differences and nonreplication, for lower level EMs are highly consistent between the two settings (r = .97). Rather, it appears that it is NCOs in particular who react to the change in interview setting (r = .52) by adjusting the salience of the various process variables. However, the possible effects of small sample sizes should not be overlooked.

To sum up, the rank of the respondent does affect the importance attached to at least four process variables in the individual interviews, although these effects are not replicated in the group interviews. Moreover NCOs appear to be more sensitive to the interview setting.

The analysis of variance also indicated significant main effects for the organizational components on 8 of the 10 process variables in the individual interviews. The referent components of *superior* and *organization* were largely responsible as the contexts within which the majority of process variables were mentioned. The organizational components failed to produce any differences in the frequency with which Justice and Job Design variables were mentioned. These findings were replicated in the group interviews, with the exception that a significant main effect was now present for the Job Design variable (p < .001). The same emphasis upon the *organization* and *superior* components found in the analysis of climate questionnaires was also present in the individual and group interview data.

A ranking of the 10 process variables by the frequency they were mentioned, by respondent rank and interview setting allowed some additional comparisons, particularly with the previously described analysis of the climate questionnaires (see Tables 3 and 7). First, it is fairly clear that differences exist between civilian and military instruments. Not only do they produce different rankings of the process variables but also the interview data are consistently more closely related to the aggregated military questionnaire rankings of climate variables than the aggregated civilian questionnaire rankings. Second, the rank correlation coefficients suggest that military questionnaires are more attuned to the perceptions of NCOs than they are to lower ranking enlisted men. Both these findings have implications for the design of future instruments, as did the earlier finding of the differential importance attached to at least 4 of the 10 process variables. Analysis of individual and group interviews, and incident and description data essentially replicated the 10 organizational process variable dimensions found in the instrument review. Examples of interview statements scored for each variable are provided below.

74

Table 6

Ranking Frequencies of Process Variables Occurring
in Questionnaires and Interviews

	Questionnaires		Individual Data			Group Data		
	Military	Civilian	E1-E4	E5-E9	E1-E9	E1-E4	E5-E9	E1-E9
Support	2	3	1	4	2	1	3	2
Personnel Development	1	6	4	2	3	4	1	3
Teamwork	5	1.5	2	1	1	2	2	1
Communication and Clarity	7.5	8	9	9	9	8.5	5	5.5
Order and Organization	7.5	7	5	5.5	6	6	7	5.5
Standards	4	5	6.5	3	5	7	10	10
Job Design	10	9	6.5	8	7	5	9	7
Responsibility	6	1.5	10	7	8	10	6	8
Feedback/Rewards	3	4	3	5.5	4	3	4	4
Justice	9	10	8	10	10	8.5	8	9
			N = 18	N = 16	N = 34	N = 8	N = 8	N = 16

Table 7

Rank Order Correlations of Process
Variables by Data Source

	Civilian questionnaire	Military questionnaire	Individual data: E1-E4	Individual data: E5-E9	Individual data: E1-E9	Group data: E1-E4	Group data: E5-E9	Group data: E1-E9
Civilian questionnaire								
Military questionnaire	61*							
Individual data: E1-E4	39	61*						
Individual data: E5-E9	64*	75**	70*					
Individual data: E1-E9	63?	75**	91**	92*				
Group data: E1-E4	34	55	97**	65*	78**			
Group data: E5-E9	49	66*	58*	52	64*	58*		
Group data: E1-E9	44	52	79**	50	76**	81**	79**	

* Significant at .05 (one tailed test).

** Significant at .01 (one tailed test).

1. *Support:* Scored when high or low performance or morale results from:

- *supervisor's concern for his/her subordinates' personal needs*

Example: "I know one good sergeant. When you came to work, you say good morning to him, he'd say good morning to you. With this sergeant, we worked together like one big happy family. When something happened to his personnel, he'd try to help, not just do nothing. Other NCOs try to break a man down, hassle people. He treats people like they're men. You can talk to him straight. If a man needs a day off to do personal things, he'll give it to him. He'll back you up. Like during PT, a guy got a cramp playing water polo and swam over to the side to rest. The E7 there said: 'Man, why are you slacking off? You got extra PT now.' He went and told our sergeant. He said to the E7: 'Don't you be yelling at my people. They don't work for you.' He didn't make him do extra PT."

- *provision or absence of command services*

Example: "Everyone knows that Fort X is just lousy duty. There's no transportation, so the guys got no way to get around; most young enlisted can't afford cars. There's nothing to do on your off time. Recreational facilities are inadequate. There are only two places to go: the recreation center and the swimming pool. People use them but not much. The reason is that they have too many rules, and we get fed up. For example, at the pool, if the attendant decides to take a break, you have to get out of the water. At the recreation center, you have to sign everything out, like sign out pool tables, and then they only let you play 40 minutes and then kick you out. There's only one little bank way the hell over on the other side of the base, and it's only open during the day when most guys can't get there. Then it's got only four service windows, and on payday you got 10,000 people on this post who got to cash checks, and men have to stand in line for hours. In Germany, when you get paid, each battalion has a pay officer who pays you in cash right there, or an American Express person who would cash your check and let you buy German money right there . . . medical's really bad. You can't get in there—officers' wives can, but ours can't. You don't see them giving officers' wives the runaround on appointments. My wife lost two babies (miscarriages). They didn't do nothing for her. Finally I took her to a civilian doctor in town and paid for it out of my own pocket. That stinks 'cause that's part of what I signed up for: the medical services. That's part of my pay."

- *provision or absence of hygiene factors*

Example: "Bad leaders just care about the mission, not for the men. For example, we were out on half-tracks on the field, and a couple of tanks broke down. The rest of the company kept right on going. The CO told us to wait. They just continued with the mission. They forgot all about us. We didn't have any chow for two days. That kind of thing has happened other times as well. One day when we were in the field, it was pouring rain. He (the CO) didn't let us erect a tent. It's standard operating procedure to give the men some shelter. This guy didn't have the troops first. He didn't communicate with them or take care of them. Finally, he got relieved."

77

2. *Personnel Development:* Scored when high or low performance or morale results from:

● *supervisor's formal training or informal coaching of subordinates to improve their job-related skills or help them advance in their careers*

Example: "I came from a unit in Germany that was run as an artillery unit was supposed to run. It was very effective. We were first in the ARTEP inspection and on our battalion ARTEP we were judged most effective. When I took over in Germany my gun crew was in last place. In one field trip one month, I moved them all the way to the top. Charlie battery was the best battery and my section was the best section. Yet when I took it over, it was known as the 'drug battery' because they had lots of drug problems. I did lots of counseling. I trained them on the weapons they were going to use. The first thing I always do is find out what type of training a guy needs. First I explain the duties of the cannoneer, what the specific job is. Then I explain what each man in the crew does and what vehicles are involved. Then we go over general subjects: weapons orientation, 50-caliber machine gun, other crew-served weapons. Then I take the men out on the gun itself, and go over sites, ammunition and safety. I get them actually working on the gun on two or three practice trips, going through each step slowly. The fourth time out we start working speed. I get people their drivers' licenses and drivers' training. They need this because gun carriers don't drive anything like cars, and it gets them eligible for promotion to Spec. 4. . . . When someone leaves here, he has a very good knowledge of basic artillery."

● *subordinate's opportunity to use his/her skills or training or feel competent and adequately trained to do the tasks s/he is assigned*

Example: "My top sergeant, he's a good guy. He'll sit around and talk with us about work. We can tell him what we did and what went wrong, so he can help us straighten it out. When I got here, we were a new unit. We got classes every day on our MOS so we'd know it better. That was one good thing. And our officers were out with us every day, so they knew what was going on so they could help us. Now we know our jobs, and do them good; it's good for a man to know what he can do."

3. *Teamwork:* Scored when high or low performance or morale results from:

● *friendly social interaction*

Example: "The best top sergeant I ever had, he'd get out and socialize with us. Like after work, he'd come over and have a beer with us. He'd have guys over to his house for dinner; he did that with everyone at least once. He'd get you out of the barracks for a night. After an inspection or when we'd had a big push on, he'd organize a beer bust over at the field for the whole section. He was real strict. He pushed and pushed to get the best. But he'd joke with us even though he pushed. It really helps to have someone you know a little, that treats you like a human being. We only had him three or four months, but while we had him, he got morale up real high."

78

• *work facilitation (cooperation, mutual help, and teamwork in ac-complishing group tasks, as opposed to conflicts or lack of cooperation)*

Example: "Maintenance works when everyone pulls together. Take my company: We got two sections, auto maintenance and artillery maintenance. There used to be pride in the whole company. It didn't make any difference what section or MOS you were in; you cooperated, you were connected. If you needed parts or tools, you could get them from other sections. That's not true now. For example, there is this turret mechanic. He had 14 extra tools in his tool box. The motor pool guy asked him to borrow a tool. He said, 'Why should I give it to you? I got it and I'm going to keep it. You don't help me, and I don't help you.' That's the way it is now."

• *group cohesiveness, actions to create symbols of unit identity and pride*

Example: "One thing our new CO did, he got us all scarfs with our unit [insignia] on them, kind of to make us feel special. When we run PT, instead of just double-timing when we come up behind another unit, our CO says, 'Let's try and pass them!' And he got a little pride going. He ran with us, too, and when we'd come up behind another unit, everyone would start yelling, 'Pass them, pass them!' He'd really like that. One thing that makes morale higher is if the CO has pride in the unit."

4. *Communications Clarity:* Scored when high or low performance or morale results from supervisors or the organization clearly communicating goals, standards, and procedures, or from subordinates feeling that vertical and horizontal communication channels are open and that they know about situations concerning them.

Example: "What brings morale down is not really being informed, not knowing what's coming off. It happens in every unit. For example, one time I'd been in an outfit for one month, in an armor unit in Germany. We were scheduled to go on adventure training, a raft trip down the Rhine. Then somehow the unit was assessed and picked for a training exercise with German nationals. We had to change the adventure training to a month or so later. Morale really dropped. But when we found out that we had been specifically picked for the training with the Germans, morale went back up. The problem is we weren't told why we were picked until the exercise was over. That's what hurt morale. It hurt morale until the troops found out. Just getting told to do something on the spur of the moment tears a person down. Once it was explained to us, when we and the officers were called in and briefed and we knew why, it was okay. Once we got the word, we talked to our people and explained, and then there was no problem. We just loaded up and moved out."

5. *Order and Organization:* Scored when high or low performance or morale results from effective or ineffective organization or logistical support (e.g., the provision of needed materials, equipment, and resources).

Example: "I was at one place for desert training. It was so disorganized we never knew where we were supposed to be. When you found out, they'd tell you two seconds before you were supposed to be there. When you

got there, the wrong people were there. Our leaders didn't know what was
going on. We were supposed to start trials at 6:00 a.m. but they were not
run until about noon, so we were just sitting in tanks for hours doing
nothing. We had big problems getting parts for equipment. We put in
forms, but when we need them we can't get them, and we only get them when
we don't need them. For example, a grease gun needed for lubricating the
road wheels: It took me seven months to get a new one after I turned the
old one in. Another example, in March, 1976, I turned a part in, a top
bracket that prevents the sight from swiveling around. I got it back a
year later and it's still broken. I talked to my platoon sergeant and he
talked to the maintenance officer but nothing happened. I even went to
the maintenance battalion to talk to the NCO there: Initially I bugged
him once a week, but finally I gave up. There's no planning or coordina-
tion or anything; it's so screwed up we can't do our jobs, and no one seems
to care."

6. *Standards:* Scored when high or low performance or morale results
from the presence or absence of clear performance, personal conduct, disci-
pline, or equipment standards.

Example: "I'm not happy with the standards here. The division ser-
geant major in my last command put out standards: 'Your troops will look
like this, belt buckles shined, webbing straight.' Standards started
out at the top and worked their way down until everyone knew them. Here
no one pushes standards. I'm looked at as a weirdo because I make my
troops look sharp. Here no one on top cares, or is pushing for setting
standards on how the division should look. My platoon (me and my lieu-
tenant) demand discipline: no talking in formation, standing at good at-
tention position, just basic Army discipline. In other formations, guys
will be talking, scratching themselves, looking around. Me and my lieu-
tenant got here at the same time. When we first got here, we looked over
the 22-10 manual. We looked at indicators of leadership, morale, and
esprit de corps and we saw all of them were lacking. The unit was down
range practicing for the ARTEP. Morale was way down because the battalion
had been down range for three weeks in winter just practicing, not for
real ARTEP, just practice. We set some standards for appearance, equip-
ment, practice, to give them something to shoot for. We started building
morale up. The unit didn't even look like a regular Army unit. We did
it by looking at a soldier and saying, 'Look at your webbing, your uni-
form, your haircut. It should look like this.' They started calling us
DIs, drill instructors. But the harder we were, the more they respected
us and morale went up. Now we're real hot. We were rated the best platoon
in the division on the last ARTEP inspection."

7. *Job Design:* Scored when high or low performance or morale results
from intrinsic aspects of the job: enough activity to keep people busy,
challenging work, variety, identify with a completed whole, or feedback
from the work itself.

● *activity*

Example: "The worst unit I was ever in was a total waste of a tour.
It was a new outfit, a cavalry unit. They had brand new equipment, but

80

wouldn't run it. The artillery just sat there. Their only interest was in infantry exercises. All we did was just sit there for a year. We didn't even go to the motor pool where our equipment was. I didn't accomplish anything. We didn't have any ARTEPs, tests, feedback of any kind. It was the sourest tour I've had in 21 years in the Army, because I did nothing. And we had brand new guns and I could only get to the motor pool twice in the whole year. We had no goal, no mission, nothing. We never fired even one round. I was actually happy to go to Vietnam: at least I was back doing something."

● *challenge*

Example: "Here at Fort X, there's no challenge. In Panama, we had a real sharp unit. We had lots of things to work with. In training, there was more challenge: you could learn. In Panama, training was in the field. We were always in the interior, in jungle training. Scope training was realistic, really like combat. We really went places; there was adventure in it. Here, you don't get to go to the field; you just stay on the base and sit around in the motor pool doing nothing. Or if you do, it's just riding around in half-tracks. People just lay in the back of the tracks sleeping. You don't feel any war in it, there's no challenge. I dig adventure training; jungle training is the most beautiful fighting in the world."

● *intrinsic identity and feedback*

Example: "In our ARTEP results, we were the best platoon in three battalions. Ours was the only one that fired rounds. In gunnery we qualified four or five tanks, which was the best on the post. The inspection team mentioned that to my CO. And this was despite the fact that three of five of the tank commanders were on leave during the inspection. The men did it. All 19 were real good. What I recommend to get this good performance is more time with the tanks, more gunnery practice, more good tank work. It's important to keep the troops busy with something real that needs to be done, not just make-work. I always have something real for them to do. They look forward to going to the field. They always want to go, instead of being in the motor pool with the tanks, not moving. They enlisted to ride tanks. You need to let them ride; otherwise they get bored.

"Another critical area is the down range part of the job. I get their hands-on experience every chance I can. People basically enjoy it, getting ready for ARTEP, firing practice, just practice firing the guns. Guys love it because that's what they're getting paid for, and they're good at it. They make mistakes, but when that happens they get told about it. But also when they do it right, when all four guns hit the target and the down range spotter calls up and says, 'Beautiful sheaf,' that goes down the chain of command to the gun crews and they love it. That's nice. They like the recognition. When they screw up, well, the key word is 'fair.' They know they've goofed and they know why. C battery has, in the ten months I've been there, consistently done better than the other battalions."

8. *Responsibility (Autonomy and Influence)*: Scored when high or low
performance or morale results from people's ability to make job-related
decisions without over-control from supervisors, or to feel they can in-
fluence and control their work situation.

   Example: "The major point is the feeling of untrustingness projected
on NCOs. Senior NCOs were doing everyone else's job. If everyone were
doing his own job, the unit would run smoother. For example, the Ammo
section has an E5 in charge and he's fairly competent. Before the last
IG, an E7 who knows nothing about Ammo took it upon himself to take over
the E5's section, preventing the E5 from doing his job. The E7 is a hard
man to get along with. No one likes him. The Ammo section worked 12
hours a day for two weeks before the IG, painting trucks to make them
look nice, but they still failed the inspection. I think it was hostility
coming out. The E5 is completely demoralized. He was just so ineffective
when the E7 came over and took his job away from him, he was just like an
E2 because he didn't have the responsibility to get the job done. Now he
has a very bad attitude and is getting out of the Army.

   "Another example is that every time we go to the field we have to do
basic periodic tests, aligning the gun to make sure it fires straight. The
E7 has so demoralized the NCOs that, when I told this one NCO to get all
the stuff we needed for the test, he got everything except one thing, a
20-foot piece of string. He came to me and said 'I can't do it because
I don't have a piece of string.' Now, he's not that dumb. His initiative
has been completely zapped. Hopefully this will change. The new battalion
CO has said to the whole battalion, 'Section chiefs will have complete re-
sponsibility for their units.' If he means that, it will really help."

   Example: "One night we were in the field. I was driving the truck.
Our lieutenant was with me. He had lost the map. He told me to go straight
across the field. I said to him, 'Look, sir, I know there's a big ditch
out there. I can't see it in this dark and it's real big. If I go over,
all the other trucks are going to go over with me. Can I go as far as I
think we can and then turn and go on the road?' He said, 'You're in
charge.' For the next three hours, I was leading the whole platoon, an
E1 telling guys who had been in 18 years what to do and where to go. I
was right. The ditch was right where I thought it was. That really put
my morale up because I had real responsibility."

9. *Feedback and Rewards*: Scored when high or low performance or
morale results from supervisors, co-workers, or the organization giving
individuals feedback on how well they are doing their jobs, or rewarding
good task performance.

   Example: "I came from Hawaii, from the 25th division. There we had
the best division in the Army. We really had it all together. When I
first got here, I started comparing Fort X with the 25th. The first thing
I saw was that there was no ascendency program for soldiers. The 25th had
a "best by test" program to recognize the good soldier: gunner, rifle
squad, every specialty. Each level, platoon, then company level, then at
battalion level, identified its best soldiers in each specialty. At each
level, there was a competition for the best policeman, rifleman, etc.
Guys who won got public recognition: a certificate, a three-day pass.

That had morale sky high. It really means something to a soldier to have a commendation from the division commander, a two-star general. They worked hard over there, but they walked around real proud. There's nothing like that at Fort X, and there should be. The most important thing is to let guys know how they are doing, and give the deserving ones a little pat on the back. Most people want to do a good job, if you show them how. I have a little book and I keep track of who's doing a good job. For the guys who are doing a good job, if something comes up and is up to standards, I'll cut them loose. If someone's not performing as he should, I deal with him by personal counseling. I have this one E6 who's slow on the uptake, but he's improving. I sat down with him and let him know where he's weak and how he can improve. It's hard. I hate to do it. I just start. I have a 5x8 card and I just start by saying how I feel and I go down my list. I tell him the things he's not doing up to par and I let him ask questions. Then I give him a pep talk about what I expect, and how he can square away, and what will happen if he doesn't square away. I deal with people as individuals. I try to let him know right away where he stands. Some I pat on the back, some I kick in the ass, depending on the person."

10. *Justice:* Scored when high or low morale results from the extent to which rewards, discipline, and work assignments are handled on a fair and equal basis, without discrimination or favoritism by race, sex, or other individual bases.

Example: "With discipline, there are problems with favoritism. One guy, I'll call him John Doe, had a little personality dispute with the CO and missed a formation. He got an Article 15 and got 14-14 (that is, 14 days restriction and 14 days extra duty) and a fine. Now another guy went AWOL and left a weapon, a loaded M16 rifle, unattended. That's a major violation. I found the M16 and turned it in and I wrote up a charge sheet on him. He went in for an Article 15 hearing and he got seven days extra duty, seven days restriction and a small fine, and all of them were suspended. He was the teacher's pet. He just got a slap on the wrist. The CO screwed up. The troops didn't come right out and say it, but you could feel it. They felt, 'One guy goes AWOL and leaves an M16 out, a big thing, and gets all of his punishment suspended. The other guy just misses formation and gets busted.' That's favoritism and it hurts morale."

IV. ORGANIZATIONAL EFFECTIVENESS CRITERIA

The third subtask of Phase I of this study was to identify organizational effectiveness criteria, "hard" result outcomes, that could be used to measure the effects of work environment and organizational intervention efforts. Four methods were used to identify these criteria: (1) content analysis of the behavioral event interview protocols, (2) direct questioning of respondents in the group interviews about effectiveness measures used by their units or routinely reported in installation management information systems, (3) similar questioning of OESOs at the two interview sites about criteria they used or would like to see made available to assess

organizational effectiveness, and (4) tabulation of measures reported in
the criterion validity studies summarized in the instrument review.

Consistent with the instrument review taxonomy, effectiveness measures
were categorized as either performance or satisfaction outcomes. The cri-
teria identified, with brief comments on their availability and reliability
as perceived by respondents, are summarized below. These criteria should
be considered as a "shopping list" of alternatives rather than a recom-
mendation of specific measures. As a result of the Army's highly decen-
tralized management system, the availability of measures varies widely
from installation to installation. In most cases OESOs will have to de-
termine the availability and reliability of organizational effectiveness
measures on a site-by-site basis.

Performance Measures as Perceived by Respondents

Five types of performance effectiveness criteria were found: inspec-
tion scores, mission accomplishment results, efficiency measures, personnel
development indices, and awards.

Inspection Scores

1. *ARTEP scores:* the most commonly cited combat preparedness rating.
Available at the unit (e.g., platoon battery) and battalion levels. Relia-
bility considered good.

2. *IG inspection scores:* Scored 2 = outstanding, 1 = satisfactory,
0 = unsatisfactory. Second most commonly cited rating. Available for all
units at most levels on a variety of criteria: equipment maintenance,
materials, inventory, space cleanliness, personnel, etc. Reliability con-
sidered only fair because IG inspectors are reportedly "reluctant to give
Unsats because they can wreck a guy's career," so they give mainly "Sats"
with a verbal warning about what to fix; hence there is a great variation
among units with identical "Sat" scores.

3. *TPI (Technical Proficiency Inspection) scores:* nuclear weapons
use and security. Available at battalion and installation levels for ar-
tillery units qualified for nuclear weapons. Reliability considered very
good, although scores perceived largely depending on "security paperwork"
(e.g., one command reportedly failed because an office clerk had not had
a drug urinalysis recorded on a personnel form).

4. *COMET scores:* Department of the Army quarterly inspection of all
equipment except TA50s (equipment issued to individuals). Available in
some units (other respondents had never heard of this inspection). No
data on reliability.

5. *TA50 scores:* possession of equipment issued to individuals.
Availability depends on units: Some keep strict records, hold formal
inspections; others appear more casual. Reliability questionable if
data collection is informal.

6. *SQT scores (Special Qualifications Tests):* practical, hands-on tests on individual competence in use of actual equipment. Available for some MOSs. Reliability considered very good if test is practical and on specific equipment (e.g., the time taken to arm an actual mine) but unreliable if a paper and pencil test ("a lot of guys who get high scores on those tests--and get promoted--don't know which end is up on an actual piece of equipment when they get in the field").

7. *Field Day scores:* a variety of measures available at unit, company, and battalion levels where field days are held--e.g., tank placement, firing scores, time to run an obstacle course for armor units. Availability seems at the option of the units: Some have field days and measure results; others do not. No data on reliability; probably varies widely.

Mission Accomplishment Results

1. *Number of hours flown in air units:* available and reliable.

2. *Accident rates:* equipment or personnel casualties per given period of time (1,000 hours of flying time, one month or one year). Available and reliable where records are kept.

3. *Mission objectives:* e.g., the number of objectives in a command's "management by objectives" plan accomplished to standards within the time period projected. Mission objectives are highly variable by organization; availability and reliability are questionable in most units.

Efficiency Measures

1. *Operational Readiness Status Reports ("OR rates"):* measure of the status of each piece of equipment, whether it is functional and combat ready or nonoperational. Available in some armor units, motor pools, and the like. Reliability considered poor because "much gundecking goes on."

2. *Deadline reports:* measures of the time required to get a given piece of equipment repaired. Available in some maintenance groups. Reliability varies greatly with the strictness of recordkeeping among units.

3. *Equipment casualty reports:* special report chits which must be submitted when certain equipment breaks down.

4. *Maintenance requests (Form 2404):* measure of time elapsed between the time a request is made ("time in" noted on the request chit) and the maintenance task is completed and/or the repaired piece of equipment is returned to its unit owner ("time out" on request chit). Available in some maintenance groups. Reliability varies with the unit's recordkeeping procedures.

5. *Parts requisitions:* (1) measure of time elapsed from the time a part is ordered or requested and the time received, and (2) "completion rate": the percentage of correct parts received to total parts ordered; hence a measure of errors (delivery of the wrong part), stock outs, broken

parts received, etc. Available in supply units; reliability varies with unit recordkeeping.

6. *Equipment lost reports:* available by category in most units. Reliability poor--much "slippage" and "gundecking" perceived by respondents.

7. *Service requests:* measures of (1) the time elapsed between the time a service is requested and the time it is received (an installation or MOS reassignment, housing placement, medical appointment, a check cashed, or a report typed), and (2) "completion rate": the percentage of service requests completed to the requestor's satisfaction to the total number of service requests. Rarely available; no data on reliability.

Note: Service request measures are particularly relevant for hard-to-measure installation support functions performed largely by civilian civil service or contractor personnel. For example, the organizational effectiveness of electricians, plumbers, secretaries, personnel and housing office clerks, and the like can all be measured with appropriate service request data. These data can readily be translated in cost and benefit dollar figures by multiplying time statistics by hourly wages or wage equivalents (direct labor expenses plus fringe, overhead, general and administrative, and in the case of civilian contractors, fee, amounts). Service request data do not seem to be available at most Army installations, but it should be relatively easy to implement management information system to collect data of this kind.

8. *Cost budgets:* whether officers with budgets exhaust their funds before the end of the budget period, overrun allotted budgets, or have unexpended funds. Several respondents noted that they received a *specific* dollar or material budget (e.g., "I've got only 125 rounds of ammo to last me a year"), and that "effective" supervisors and organizations planned carefully to stay within these constraints and balance expenditures over the allotment period, while "ineffective" officers "used everything up in the first four months and couldn't do any training after that." Availability and reliability of unit cost and budget information are likely to be major problems with this measure.

Personnel Development Measures

1. *Promotions:* the percentage of persons promoted (or eligible for promotion by test and point scores) at important rank levels (e.g., E3 to E4 to the total number of persons at the lower rank). This measure is frequently used as an equal opportunity indicator by comparing the promotion percentages of majority vs. minority, or male vs. female personnel, and can be used as an indirect measure of supervisor and unit training effectiveness. Data available and reliable.

2. *Education:* percentages of persons taking or completing required or optional courses: correspondence, advanced MOS training, GED high school equivalency, college courses, etc. Available for some units. Reliability good where data are kept.

3. *Physical training:* mean unit scores or percentages of people passing required PT tests. Available in many units. Reliability good (some "gundecking" and "excused people" manipulation reported by respondents: "guys who aren't likely to pass get medical profiled the day of the "PT test").

Awards

1. *Unit citations:* available where base COs give them. Reliability depends on basis of award: good if given for inspection results, poor if for "special performance--because there aren't any set standards"; and these awards are considered capricious.

2. *Individual citations and merit ratings:* available and reliable especially where formal "best by test" competitions are conducted to identify and reward performance in MOS categories.

Satisfaction Measures

Included as satisfaction measures were retention, discipline, inter-group health, family, and community relations outcomes, on the assumption that individual feelings of well-being or discontent are casually related to these outcomes.

Retention Rates

1. *Retention rates:* the percentage of first term and career reenlistments, or junior officer resignations. Reenlistment intentions are frequently used as a surrogate variable because intentions (measured by survey responses to the question "at this time I intend to reenlist/not reenlist") have been found to correlate highly with actual reenlistment actions (r = .80-.95, Gould, 1976; Wissler, 1976). Available and reliable.

Disciplinary Actions

1. *Article 15s:* number per 100 enlisted men per a given time period (month or year). Article 15 actions can be broken down by reason given to provide specific measures: unauthorized absences, drug use, insubordination, fights, racial incidents, and the like. Available in most units. Considered somewhat unreliable and questionably interpretable in terms of organization effectiveness by most respondents because: (1) standards vary ("one guy's tough and hands out Article 15s for every little thing, another hardly ever writes anyone up"), and (2) many military officers consider some Article 15s to be a positive indicator of organizational effectiveness ("a few busts show that a unit's got some discipline and standards are being maintained").

2. *Court martial actions:* number per 100 enlisted men per time period. Available and reliable but relatively rare, hence perhaps not a good measure of organizational effectiveness.

3. **AWOL rates:** the most commonly cited measure of satisfaction. Available and reliable. OESOs noted that it would be valuable to break AWOL statistics down by cause, for example, family crises versus dissatisfaction with one's unit or the Army, but indicated that this data would be hard to get on a reliable basis.

4. **Drug charges:** formal arrests or "busts" per 100 enlisted men. Available but considered somewhat unreliable because some supervisors are much harder on drug use than others.

5. **Assaults:** available but perhaps unreliable: Some supervisors consider an occasional fight "good for the boys" and do not report assaults to the UCMJ system. Serious assaults probably reliably reported.

6. **Thefts:** thefts, measured by the incidence of theft reports, mentioned to be an indicator of satisfaction, morale, and discipline ("you don't get as many on well run posts where morale is high"). Available and as reliable as any "crime statistics" (probably underreported).

Note: Numerous other "crime statistics" could be used as organizational effectiveness measures where base or community records are kept; the discipline and infraction criteria mentioned above were the most frequently cited by study respondents. Some infractions--driving while intoxicated (DWI) charges, child abuse, and inter-group assaults--are discussed as separate criteria below.

Health Statistics

1. **Accident rates:** number per 1,000 hours worked or per 1,000 employees. Some installations have excellent accident report record systems and have made accident rates a major organizational effectiveness priority. Availability and reliability vary by site.

2. **Sick calls:** number of medical appointments requested, lab tests performed or pharmacy units dispensed divided by the total number of persons in a unit or at an installation. Medical data can be broken down into specific measures by admitting complaint, for example, accidents, venereal disease, urinalysis positive for drug use, alcoholism, stress-related illnesses such as ulcers and hypertension, and psychiatric complaints: anxiety, depression, disturbed behaviors. Availability may be constrained by privacy act considerations. Reliable. Malingering as well as real illness can be considered an organizational satisfaction measure.

3. **Suicides:** data availability and reliability questionable (suicides are reportedly "hushed up").

4. **Alcohol abuse:** alcohol referrals, including driving while intoxicated (DWI) charges, leading to mandatory treatment as measured by percentages of people referred to total numbers in a unit or at an installation program. Available where alcohol programs exist and reliable (underreported), but there are questions of interpretation: Do more effective organizations identify and try to help more alcohol abusers, or do poor organizations "drive people to drink?"

5. *Drug abuse referrals:* percentage of drug-positive urinalyses, self-referrals, or mandatory referrals as a percentage of persons in a unit or at an installation. Available at installations with drug programs and reliable, although with questions of interpretation.

6. *Psychiatric complaints:* incidence of persons seeking counseling for emotional problems. Available but may be unreliable (one respondent reported his CO had ordered that "no one be sent to the shrink, it makes the command look bad").

Note: Other illness categories can be used as organizational effective criteria if data are available; those cited above were mentioned most frequently by study respondents.

Intergroup Relations

1. *Racial incidents:* incidence on or off the base. Availability and reliability questionable because incidents are often not reported. (One respondent gave the following example: "The first CO who reported a racial incident got a call from the Commanding General personally--the CG told him he didn't want to hear of any more race incidents, and sure enough, no one's ever reported another one.")

2. *Equal opportunity indicators:* numbers of equal opportunity complaints filed and percentages of minority groups and women promoted at various rank levels. Increasingly available and reliable where formal complaints have been filed.

3. *"Unobtrusive measures":* e.g., the number of minority personnel in "white" bars and vice versa on randomly observed nights. Data of this kind generally unavailable, difficult to collect, and unreliable.

Family Measures

A number of respondents mentioned military persons' management of their personal lives and families as indirect organizational effectiveness criteria. Measures included:

1. *Divorce rates:* may be available from personnel records; possible privacy concerns.

2. *Requests for family counseling:* available and reliable where this service is provided on post.

3. *Credit and indebtedness indices:* the incidence of persons seeking credit or personal financial management counseling, having wages withheld to pay off debts, having automobiles, furniture, or other possessions repossessed, "bouncing" checks, or filing for personal bankruptcy. Respondents noted that supervisors often issued Article 15s to subordinates who mismanaged their personal finances. ("You bounce a check at the commissary, you get restricted.") Availability and reliability questionable; possible privacy act problems.

89

4. *Child abuse:* incidence among members of units. Frequently cited by respondents but probably unavailable and unreliable.

Community Relations

1. *Civilian arrests:* incidence per 100 enlisted personnel, broken down by type of infraction. Available and reliable where military and civilian police share information.

2. *Community protests:* incidence of complaints about military personnel in civilian areas. Probably not systematically available and unreliable.

APPENDIX A

PRINCIPLES OF SURVEY INSTRUMENT CONSTRUCTION.

Instrument Construction

The literature on survey instrument construction (Hyman, 1955; Nunnally, 1967; Babbie, 1973) provides a number of criteria for assessing instrument construction. These include: scaling, item content, comprehensibility, response bias, and item and instrument rejection.

Scaling

Several different item formats may be used to elicit information from survey respondents. Four considerations are scale anchors, scale format, scale range (number of scale intervals), and scale neutral points.

Scale Anchors: Scale intervals can be "anchored" with horizontal lines, numbers, statements such as "agree" or "disagree," interval definitions with specific data or behavioral criteria, happy or sad cartoon faces (Smith, Kendall, & Hulin, 1969; Kunin, 1955) or left unanchored.

Examples:

(a) Specific Data:
"The amount of time I spend working alone is:"

| 0-20% | 20-40% | 40-60% | 60-80% | 80-100% |
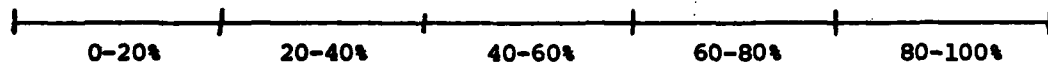
(b) Behavioral Description:
Which of the following phrases best describes your supervisors' goal-setting behavior?

| Never mentions goals | Has vague goals, nothing specific | Talks about specific goals, but does not have specific measures of goal accomplishment | Sets specific, measurable goals, but does not have action step milestones with due dates | Sets specific, measurable goals and action step milestones with due dates |
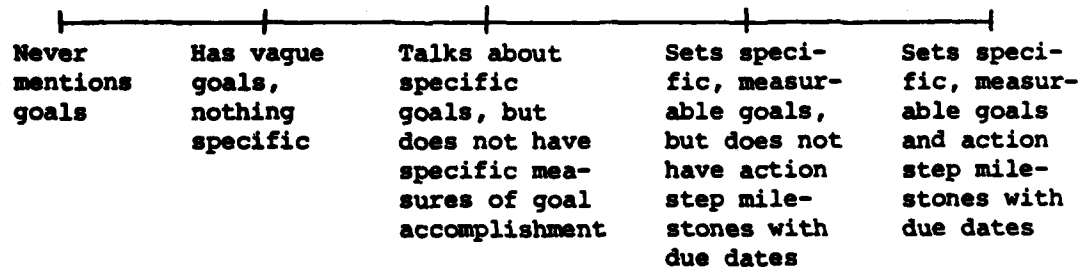
The general rule is that more specific interval anchor descriptions produce more accurate, less ambiguous data where a respondent has been asked to make a judgment about something he can objectively observe. Conversely, unanchored scales may produce less biased data about purely subjective perceptions because the respondent is not forced into choosing a category and hence can report finer nuances of feeling.

Example:

Place a mark on the line below at the point which best indicates how much you like your job.

Very little———————————————————————Very much

An additional consideration with anchors is to make sure that intervals are equally weighted. For example, Taylor and Bowers found that the following anchors produced different responses:

Older Form	Machine-Scored Form
1. not at all	1. to a very little extent
2. to a very little extent	2. to a little extent
3. to some extent	3. to some extent
4. to a considerable extent	4. to a great extent
5. to a very great extent	5. to a very great extent

In this case, "not at all" in the older form was more negative than "to a very little extent" in the machine-scored form, and the lower end of the older form's scale was out of balance with its higher end.

Most instruments reviewed used Likert scales with numerical anchors; very few provided specific descriptive or data anchors for item intervals.

Scale Format: At least five different item formats were identified in reviewing work environment and organizational climate instruments.

Likert: By far the most common item format was the "Likert scale," usually a line with five or seven interval points below or to the right of an item.

Examples:

(a) "My supervisor sets specific goals for this work group."

To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
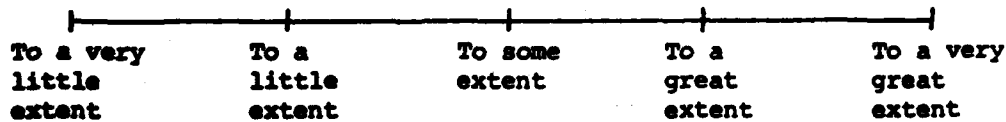
(b) "Work activities are sensibly organized in this company."

Strongly disagree	Mildly disagree	So-so	Mildly agree	Strongly agree
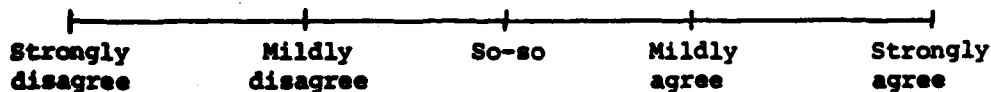
Likert scales have the advantage of being simple and easily interpretable by respondents and of eliciting a range of judgments, but may result in biased data (see discussion under "response set" below).

Semantic Differential: Scales can be constructed with two diametrically opposed item descriptions on each side of a scale line. Respondents

are asked to mark the point on the line that best describes their perception of the variable.

Examples:

(a) Mark the point on the line below which best describes your supervisor's handling of disciplinary actions:

Fair ———+———————+———————+———————+———————+——— Unfair

(b) People do not   People know
    know what is   what is ex-
    expected of   ———+———————+———————+———————+———————+——— pected of
    them in this   them in this
    organization   organization

Arguments for use of semantic differential scaling include evidence that people tend to think in terms of the bipolar contrasts of a relatively small number of characteristics of anything they observe or evaluate (Osgood, 1962; Osgood et al., 1957; Newell & Simon, 1972) and that semantic differential formats present respondents with an unambiguous, visually and conceptually balanced choice.

Forced Choice: Scales can be constructed which force a respondent to choose one of two alternatives, as in the familiar "True-False" format.

Examples:

(a) "People who do good work get rewarded in this organization."

        True _____
        False_____

(b) "My supervisor's handling of disciplinary actions is:"

        Fair_____
        Unfair____

Forced choice (dichotomous) items have the advantage of eliciting unambiguous data, but by restricting the respondents' alternatives, they lose much of the power attainable with scaled items and are less reliable than scales with more interval choices. Item rejection may also be a problem. "The unacceptability to the rater of the forced-choice format [is] the most crucial deciding factor. The experience of the Army with this system led to its abandonment in 1950, since raters . . . found it so unacceptable to rate without knowledge of the final outcome that they concentrated on finding ways to beat the system." Smith & Kendall (1963).

Ranked Responses: Items can be constructed which ask respondents to number response alternatives on the basis of their agreement or disagreement with the item, force rank alternatives, or distribute a number of points between several response alternatives.

Examples:

(a) **Numbered responses:**
Using the numbers 1 to 5 (1 = as little as possible and 5 = as much as possible), indicate how much of the following characteristics you would like on your job by putting the appropriate number in the box opposite the item.

    a.   the chance to do interesting work   4

    b.   security   2

    c.   a high salary   5

(b) **Forced ranking:**
Using the number 1 to indicate your first choice, 2 to indicate your second choice, and 3 to indicate your third choice, rank the following things you would like from your supervisor by putting the appropriate number in the box opposite the item.

    a.   treat me in an open, friendly way   3

    b.   let me know exactly what he/she expects
       of me   1

    c.   give me more responsibility   2

(c) **Distribution of numbers:**
Distribute 10 points among the following sentences to indicate how often you do each of the following on your job. Always use all 10 points. Never use more than 10 points or fewer than 10 points. You may use zeroes.

    a.   work with others inside the organization   7

    b.   work by myself   3

    c.   work with others outside the organization   0

Ranked responses tend to be less easily interpreted than graphic scales, which provide a visual example of the rating continuum and range of response alternatives. As a result, items of this type produce more errors due to respondent confusion [subjects tend to forget the meaning of the numbers and confuse the ends of the scales (e.g., "Did '1' mean I agree or I disagree?")], mistakes in arithmetic (users of distributed number scales are frequently surprised at the number of respondents who cannot add up to 10), and clerical errors in transcribing numbers (e.g., 4's that look like 9's). Forced rankings may result in the same subject rejection problems encountered in forced choice items. In general, numbered response items are not recommended. (Nunnally, 1967, p. 521).

Difference Scales: Some items are designed to provide a difference or comparison score by asking subjects to answer an item (a) as it actually is ("actual") and (b) as they would like it to be ("ideal," "should be").

Example:

"I can talk to my boss."

Actual

```
|---+---|---+---|---+---|---+---|---+---|
    1       2       3       4       5
```

Should be

```
|---+---|---+---|---+---|---+---|---+---|
    1       2       3       4       5
```
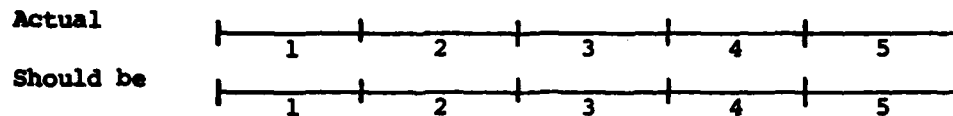
The difference score is provided by subtracting the "actual" rating from the "should be" rating, $4 - 2 = 2$.

Sometimes an importance scale is also added to this type of item.

Example:

How important to you is being able to talk to your boss?

```
|---+---|---+---|---+---|---+---|---+---|
    1       2       3       4       5
```

Of very   Of very
little   great
importance   importance
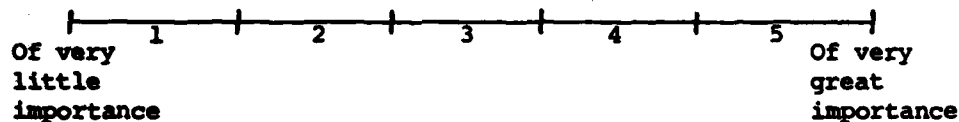
A single item format which provides a difference score is suggested by Turney and Cohen, 1976.

Example:

Circle the one appropriate number on the rating scale below which best describes your feeling about your job.

The extent to which my supervisor pushes for increased productivity from me:

Too   Just   Too
much   right   little

```
|---+---|---+---|---+---|---+---|---+---|---+---|
    1       2       3       4       5       6       7
```
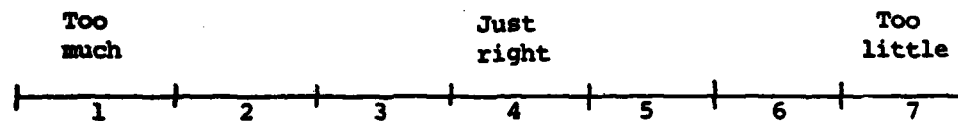
In this example the difference score would be equal to the subject's rating subtracted from the midpoint, number 4.

Difference scales have the advantage of providing data which suggest specific directions for change. (See discussion under "Intervention Utility," below.)

Other Response Formats: Some climate survey questionnaires ask for free responses (e.g., "What do you like about your job?") or specific data (e.g., "What percentage of your time do you spend working with persons outside your work group?"). Perkins (1977) has used an ingenious method of

95

eliciting responses from illiterate subjects (in this case, retarded children, senile person, and schizophrenic patients). He and his associates developed a large "speedometer" with a pointer which subjects could physically move to indicate their response to items read to them. Similar techniques include providing subjects with large Likert-type scales and asking them to point to the place on the scale that best describes how they feel, and Q-sort methods in which subjects indicate their responses by choosing 3 x 5 cards with response alternatives into "most preferred" and "least preferred" piles. Kerr (1948) has described a "tear ballot" method which asks respondents to tear the questionnaire at the response they wish to make (saving administration time and such materials as pencils and answer forms). Small group researchers have recorded responses to work group processes by having subjects press buttons linked electronically to recording and computing equipment. Some of these response format alternatives may prove valuable in eliciting responses from Army personnel who cannot read well enough to respond to written surveys. However, these alternatives did not meet the survey response format criteria and were not reviewed.

Scale Range: Scales can range from offering a choice between only two alternatives to the five intervals offered by the typical Likert scale or the 100 points offered in items which ask respondents to estimate what percentage they would give a certain variable. In general, more scale choices are better because an increased range of choices increases the amount of information or discrimination a respondent can provide. Nunnally (1967), citing Guilford (1954), notes that "as the number of scale steps is increased from 2 up through 20, the increase in reliability is very rapid . . . it tends to level off at about 7, and after 11 steps, there is little gain in reliability." As a large number of steps may confuse or irritate respondents and make the survey instrument cumbersome and difficult to score, the optimum range for item scales would appear to be six to nine.

Neutral Points: Odd-numbered scales have a "neutral point" which subjects can check if they are truly ambivalent and cannot choose between agreeing or disagreeing with an item or if they are cautious and do not want to commit themselves or if they are indifferent to the item and choose a neutral response as a way of rejecting the instrument (Kaplan, 1972). Even-numbered scales force subjects to make a choice one way or the other.

Example:

"I like my job."

(odd number- 5 intervals)	1 definitely disagree	2 disagree	3 so-so	4 agree	5 definitely agree

(even number- 4 intervals)	1 definitely disagree	2 disagree	3 agree	4 definitely agree

Nunnally (1967) argues that the even-numbered scale is preferable in that it elicits more variance in responses, especially among cautious respondents

whose response style is to habitually select the neutral point. Gould (1976) and Perkins (1977) caution, however, that even-numbered scales may cause rejection problems by making subjects feel uncomfortable, and can result in rectangular rather than normal response score distributions. Most instruments reviewed in the present study used 5- or 7-point Likert scales despite a preference in the psychometric literature for even-numbered scales without neutral points.

Item Content

Perception and attitude theory suggests that any work environment questionnaire item can have one of four components:

1. *A cognitive (or attribution) element:* what a person thinks or believes. *Example:* "Supervisors should treat their subordinates fairly."

2. *An emotional (or affective evaluation) element:* what a person feels. *Examples:* "I feel my supervisor treats me fairly" or "I like my supervisor."

3. *A descriptive component:* what a person objectively observes. *Example:* "My supervisor treats subordinates fairly."

4. *A behavioral component (a predisposition to act):* what a person plans to do. *Example:* "I will file an unfair labor practices complaint."

This distinction goes to the heart of what work environment or organization climate is. Some researchers, citing the high correlation of affective evaluation "satisfaction" variables with other dimensions, argue that respondent perceptions of other climate work environment characteristics are purely subjective and do not provide an accurate assessment of the facts of the organizational situation (Guion, 1973). Other researchers, citing data that "descriptive" variables do not always correlate with "satisfaction, evaluations, and that these climate characteristics have been shown to predict organizational outcomes, argue that climate is a viable work environment construct (James & Jones, 1974; Schneider, 1975; Hellriegel & Slocum, 1974), although most propose complex models which include all four components discussed above.

Researchers and practitioners appear to agree that items which ask respondents to describe observable behavior or characteristics of supervisors, jobs, or work groups and organizations are more useful than items which ask for affective or satisfaction evaluations (Affourtit, 1976, p. 76). Taylor and Bowers (1972) note:

Items were not designed to measure attitudes of respondents, but rather their perceptions of organization behavior. A question of the "attitudinal" type might be phrased, "How do you feel about the way your supervisor pays attention to what you say?" The "descriptive" type would instead ask, "How much does your supervisor pay attention to what you say?" This latter

approach to measurement of perceived behavior results in data
which lend themselves more readily than attitude data to sug-
gesting ways in which change could be attempted. (page 2)

Army OESO consultants (Godina, 1977; Curry, 1977; Hinds, 1977; Sayre,
1977) are unanimous in thinking that survey items and variables which tell
an officer what he can do about the problems he has are more useful than
evaluative items which assess satisfaction, motivation, and morale. "Ques-
tions which tell you the troops aren't motivated just aren't very useful
because they don't say why they aren't motivated or what a consultant or
leader should do to motivate them." Mikols (1977) has proposed dropping
the evaluative items and variables in the Army's General Organizational
Questionnaire to simplify feedback procedures and focus on descriptive
process variables which suggest intervention alternatives.

A majority of the instruments reviewed include both descriptive and
evaluative items and did not clearly distinguish between them in variable
scales.

Comprehensibility

Survey items must be easy for respondents to read and understand.
Important criteria here are reading level of the vocabulary and concepts
used in items, item length, semantics (do the words make sense to respon-
dents), syntax (do the sentences make sense), unidimensionality (does each
item ask for only one judgment), and appearance.

Reading level: An eighth grade reading level is usually recommended
for survey items. Vocabulary at this level is sufficient to express nearly
all work environment or organizational climate questionnaire concepts while
remaining comprehensible to most lower level enlisted personnel. (The
literacy of recruits in the all-volunteer military, initially seen as a
possible obstacle to the use of surveys in organizational effectiveness
efforts, has apparently not proven to be a problem.) When in doubt, the
rule is "simpler is better."

Item length: Shorter is better. Long items tend to confuse subjects
and are more likely to contain more than one factor (see "unidimension-
ality" below). Eight to 15 words is considered optimum for an item.

Semantics: Items should use words and phrases that are as close as
possible to the ways respondents actually talk. For example, Affourtit
(1977) found in work with the Marine Corps that recruits did not understand
questions which referred to "my work group supervisor" but immediately un-
derstood the same questions if the supervisor was referred to as "my NCO."
The latter language was "Marine" while the former was in organizational
terms. The rule again is to keep it simple and to talk military; don't
talk behavioral science "jargon" in writing survey items.

Syntax: Once again, simple and clear is best. Tortured syntax (long
sentences with many modifying clauses) confuses and irritates respondents.

Appearance: To minimize confusion and errors in recording and analyz-
ing data, and to motivate participants, survey questionnaires should be as
clear and attractively formatted as possible. Specific suggestions include
use of large, clear print; logical organizational and sequencing of items
(only one column of items on a page, for example); and as much "white
space" as possible. Babbie (1973) notes:

> The format of a questionnaire can be just as important as the na-
> ture and wording of the questions asked. An improperly laid out
> questionnaire can lead respondents to miss questions, can confuse
> them as to the nature of the data desired, and, in the extreme,
> can lead to respondents throwing the questionnaire away.
>
> As a general rule, the questionnaire should be spread out and un-
> cluttered. The researcher should maximize the "white space" in
> his instrument. Inexperienced researchers tend to fear their
> questionnaire will look too long, and as a result, they squeeze
> several questions on a single line, abbreviate questions, and try
> to use as few pages as possible. All these efforts are ill-
> advised and even dangerous. Putting more than one question on a
> line will result in some respondents skipping the second question.
> Abbreviating questions will result in misinterpretations. And
> more generally, the respondent who finds he has spent consider-
> able time on the first page of what seemed a short questionnaire
> will be more demoralized than the respondent who quickly com-
> pleted the first several pages of what initially seemed rather
> long. Moreover, the second respondent will have made fewer er-
> rors and will not have been forced to reread confusing, abbrevi-
> ated questions.
>
> The desirability of spreading questions out in the questionnaire
> cannot be overemphasized. Squeezed-together questionnaires are
> disastrous. (p. 45)

The format in which subjects indicate their responses can also be im-
portant. Response format alternatives include:

(1) checking a point on a line
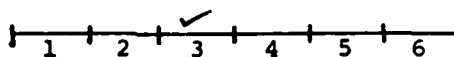
(2) circling a number

(3) marking a box
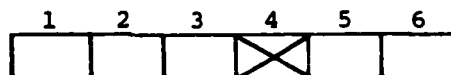
(4) putting a number in a box

Item answer $\boxed{1}$

(5) marking a space on a computer scorable answer sheet

|| || || || || █
1   2   3   4   5   6
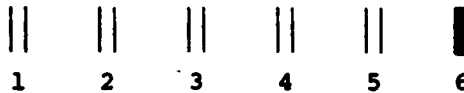
For ease in scoring and processing, the computer sheet alternative is best, although subjects unfamiliar with this format must be carefully instructed in how to transfer their scores from the instrument item booklet to the answer sheet. Otherwise, the important consideration is that the response format be large and clear enough so that subjects are not confused and their marks are easily readable. "Bunched up" and multiple line scales cause problems.

Example:

(a) Bunched up

__:__X__:__:__:__

(b) Multiple line

☐   ☐
1   2

☐   ☐
3   4
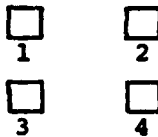
For this reason, if computer score sheets are not used, alternatives (3) (circle a number) and (4) (mark a box) are best.

Unidimensionality: Survey items should ask only one question, that is they should ask respondents to make a judgment about only one factor in a given item. For example, the statement, "My supervisor is friendly and easy to approach, and sets high standards for his work group" implies two questions: (1) Is he friendly and easy to approach? and (2) Does he set high standards? A respondent with only one rating scale to respond to an item of this type may rate one part of the question (giving either no data or inaccurate data about the other part of the question), give a compromise answer which provides inaccurate data on both factors, or be confused and refuse to answer. Even modifying clauses are suspect. Another item, "We spend a lot of time sitting around doing nothing, without any meaningful work to do" may ask a question about both "sitting around doing nothing" and "meaningful work."

The following example, encountered in the instrument review, illustrates things to avoid in item construction:

To what extent have the consultants produced an environment that encourages continual learning, training, and active interest

100

regarding the job, and the product of service to which the job
contributes a setup that enables an employee to use and develop
his personal skills and knowledge, which in turn affects his
environment and self-esteem obtained from the work itself?

This item includes no fewer than eight different factors; its vocabulary,
length, semantics, and syntax make it difficult to understand.

Items can be pilot-tested for comprehensibility and unidimensionality
in a number of ways. A rigorous approach (Thurston & Chave, 1929) is to
have a number of subjects rate each item from 1 to 11 on the basis of how
well it expresses the question it asks (e.g., how "positive" or "negative"
it sounds). Items to which most subjects give approximately the same rat-
ing are considered "good" (understandable and unambiguous) and are kept
for use in the survey being constructed. Items about which the sample
subjects disagree by giving widely varying ratings are considered "bad"
(incomprehensible, multidimensional, or ambiguous) and are discarded. A
simpler, less time-consuming approach is to take a "lowest common denomi-
nator" respondent and try items out on him. Affourtit (1977) first
screened all items used in a Marine Corps survey by reading them to a
brain-damaged Marine recruit with a tested I.Q. of 78. Any items that
this person could not understand and respond to were discarded.

Items in the instruments reviewed in the present study varied widely
in comprehensibility. In general, formal theory-based items tend to be
overly complex and to use behavioral science jargon, where grounded theory-
based instruments were more readable.

Response bias: The ways items are constructed can cause "response
bias": distortion or error in subject judgments about job or organiza-
tional environments due to the nature of the survey. Response bias con-
siderations include response set, response styles, and instrument rejection.

Response set: This refers to the format, and consistency or inconsis-
tency of the format, in which items are presented. If items are always
presented in the same way (i.e., response set is consistent), respondents
can get in the habit of responding to them in a certain way without really
reading them.

Consistent positive response set is a particular problem with Likert
scales which have a consistent positive response bias; that is, where "1"
is always "bad" and "5" is always "good."

Example: "My supervisor is friendly and easy to approach"

1	2	3	4	5
to a very small extent	to a small extent	some-what	to a great extent	to a very great extent

If an entire instrument is constructed in this fashion, respondents may get in the habit of agreeing with items and checking "4s" without really trying to make accurate decisions about these items. Peabody (1964) cites data to show that 60-70 percent of the variance in responses can be accounted for by the response set. The usual method of minimizing response set bias is to vary the set by alternating positive and negative items in the survey questionnaire and using a semantic differential format which presents a visually balanced stimulus.

Example:

```
            1 — 2 — 3 — 4 — 5 — 6
My supervisor                    My supervisor
is not friendly                   is friendly
and easy to                       and easy to
approach                          approach


            1 — 2 — 3 — 4 — 5 — 6
This organiza-                   This organiza-
tion does not                    tion has a lot
have a lot of                     of red tape
red tape which                   which gets in
gets in the way                   the way of
of getting the                   getting the
job done                          job done
```

In the first example, the "good" response is on the right, but in the second example it is on the left. The use of reversed or negative items may, however, introduce other sources of error. For example, readers used to positive items may skip over the "nots" in reversed items and respond as though these items were positive (Babbie, 1973, p. 144). Negative terms such as unfriendly or fail, may have an emotional impact which actually causes subjects to bias their responses in a positive direction (Taylor & Bowers, 1972, p. 24). Semantic differential format may eliminate these sources of error, but this question should be further researched.

Roughly two-thirds of the instruments reviewed in the present study varied positive and negative items to avoid the problems of a consistent response set; one-third used a consistent positive response set.

Item order and grouping refers to second response set bias which may be introduced by gathering all the items relating to a certain topic (e.g., supervisor behavior) together in the survey.

Example:

(1) "My supervisor is friendly and easy to approach."

(2) "My supervisor sets high standards for his work group."

If a subject answers positively or negatively to questions about supervisor friendliness, perceptions on this dimension may spill over to bias responses

about the quite different second factor, standards. The tendency for respondents to answer subsequent questions in a manner consistent with their assessment of preceding items is sometimes called the "halo" effect (Moos, 1974).

This problem is usually dealt with by introducing distractor items which have nothing to do with the variable really being measured (e.g., "I like the climate in the part of the country in which I am stationed") or by listing items in random order so that items relating to the same variable do not systematically appear together. The latter method appears to be preferable, as no items are wasted and questions about different variables act as adequate distractors for one another. Babbie (1973) notes, however, that

> A "randomized" set of questions will probably strike the respondent as chaotic and worthless. It will be difficult for him to answer, moreover, since he must continually switch his attention from one topic to another, and finally, even a randomized ordering of questions will have the [consistent response set bias] effect discussed above--except that the researcher will have no control over the effects. (p. 148)

Most instruments reviewed in the present study presented items in random order.

Other item order considerations include the degree of interest or threat in items placed first in a questionnaire. Some authors advocate putting more interesting, personally relevant, or salient items first to motivate participants to complete the survey:

> It is usually best to begin the questionnaire with the most interesting set of questions. The potential respondent who glances casually over the first few questions should want to answer them. Perhaps they will ask for attitudes that he is aching to express. At the same time, however, the initial questions should not be threatening. (It might be a bad idea to begin with questions about sexual behavior or drug abuse.) Requests for duller demographic data (age, sex, and the like) should generally be placed at the end of the self-administered questionnaire. Placing these questions at the beginning, as many inexperienced researchers are tempted to do, gives the questionnaire the initial appearance of a routine form, and the person receiving it may not be motivated to complete it. (Babbie, 1973, p. 150)

Sudman and Bradburn (1974) cite data to recommend the opposite approach, placing less threatening questions, such as those concerning demographic data, early in the survey to give respondents time to warm up and learn how to respond to items. Affourtit (1977) suggests immediately establishing the salience of the survey by asking military officers to report their units' results on "hard" command performance indicators such as inspection scores, retention rates, and incidence of racial conflicts. Most of the instruments reviewed placed demographic questions (age, sex, rank, military occupation specialty, unit identification number) first.

<u>Response styles</u>. Error in survey variable measures can also be caused by tendencies of individual subjects to respond in consistently biased ways. The most important of these response styles, which to some extent can be avoided or corrected by careful item construction, are acquiescence, social desirability, understatement (caution), overstatement, deviance, and inconsistency "lie."

Acquiescence, or agreement tendency, refers to the tendency of subjects to agree with each item (e.g., to answer "true" more often than "false" on true-false tests, or to usually check the extreme "good" end of Likert scales), especially if there is a consistent response set. There is considerable debate in the measurement literature about the importance of this factor, although Nunnally (1967) concludes:

> The overwhelming weight of the evidence now points to the fact
> that the agreement tendency is of very little importance either
> as a measure of personality or as a source of systematic in-
> validity in measures of personality and sentiments. What little
> stylistic variance there is came of that tendency, if any, can
> be mostly eliminated by ensuring that an instrument is con-
> structed so that there is a balance of items keyed "agree" and
> "disagree" with respect to the trait in question. (p. 612)

In other words, the acquiescence problem can be avoided by having both positive and negative items so that there is not a consistent positive response set.

Social Desirability refers to the tendency of respondents to say good things about themselves and to agree with "everyone" in the culture or organization as to what is good or desirable, whether or not they really agree.

Example:

This organiza-   1 — 2 — 3 — 4 — 5 — 6   This organiza-
tion should   tion should
not have high   have high
standards   standards

Few respondents are likely to agree with the idea that their organization should not have high standards, even if they feel pressured by the standards that exist. Similarly, items which ask for the degree of a respondent's agreement with organizational policy statements or particularly prestigious (or disliked) figures are likely to result in biased responses.

Example:

"Do you agree with the Commanding General that base discipline is too lax?"

"Do you agree with Socialist Worker Party demonstrators that soldiers should not be allowed in town?"

Social desirability problems can be minimized by making items as neutral and descriptive as possible, by balancing the alternatives in tone so that anchors sound equally reasonable and socially desirable, and by distancing questions so subjects are not asked to give sensitive, socially undesirable data about themselves.

Example:

```
            1 —— 2 —— 3 —— 4 —— 5 —— 6
     Higher stand-                      Higher stand-
     ards are not                         ards are
     needed in this                     needed in this
     organization                        organization
```

This item asks the "standards" question in a somewhat less biased way: A subject could check the low end of the scale, indicating that higher standards are not needed, either because the organization's standards are already high or he feels pressured by existing standards.

Similarly, in asking about drug use in a unit, an item like "I smoke a lot of marijuana" is less likely to elicit an accurate response than "People in this work group smoke marijuana." The latter item distances the question by asking the subject about others' behavior rather than his own. Perkins (1977) reports that the use of the first person pronoun "I" changes the response set enough to elicit significantly different responses to otherwise identical questions.

Social desirability response (and "lie") tendencies of subjects can be identified by including in a survey such items as, "I clean my rifle every day." Such performance sounds good, but few subjects actually do it. Data from subjects who consistently score high on such items are suspect. Social desirability biases are often estimated by administering the Crowne-Marlowe Social Desirability Scale with the instrument being tested, instrument items correlating highly with the Crowne-Marlowe Scale are discarded.

Understatement or cautious response tendencies emerge with respondents who habitually avoid taking a stand on items by checking neutral points, points near the middle of scale, or the least extreme anchor alternatives on scales. This response bias can be avoided to some extent by using even-number interval, no-neutral point, or dichotomous (true-false) scales which force people to take a stand. Cautious responses can be corrected for in statistical analysis of survey data by identifying data with significantly smaller item variance than found for the sample as a whole and inflating the understated data to average levels. More simply, markedly deviant data can be discarded.

Extreme or deviant responses appear with respondents who deliberately check the extreme positive or negative ends of scales, or differ radically from the average response given by most subjects. These responses can be limited by reducing the number of scale intervals or by using dichotomous scales where extreme responses are impossible, although both methods sacrifice reliability (Nunnally, 1967, p. 613). Extreme responses can also be identified and adjusted or discarded in statistical analysis of survey

data. In general, items which elicit either cautious or extreme responses (i.e., show little variance or extreme variance) from a majority of subjects should be discarded, because in this case the fault is probably in the item rather than the respondent.

Inconsistency ("lie") responses are those in which subjects differ markedly in their responses to very similar items measuring the same variable (for example, rating a supervisor high on "friendliness" on one item, and low on "acting in a friendly way" on a subsequent item). This type of inconsistency can be due to deliberate lying or rejection of the instrument, or to confusion or lack of comprehension. Inconsistency is easily identified in statistical analysis of instrument data (by comparison of responses to similar items, or unusual variance in items measuring the same variable) and can be adjusted by discarding deviant responses or all data for the subject. Again, if many subjects report inconsistent data, the problem is probably the instrument, and it should be redesigned.

Only one of the instruments reviewed attempted to identify response style biases. Moos (1974) constructed an extreme response "halo effect" and an inconsistency scale of five extremely positive and five extremely negative items to which fewer than 10 percent of his sample population responded. Subjects who did respond to these items were presumed to be lying, responding extremely, or inconsistently, if their responses were divergent. In the final version of his instrument, however, Moos dropped this subscale because he found that data from subjects who scored high on it were unusable and would be discarded for other reasons (rejection of the instrument or failure to complete). Few work environment or organizational climate researchers report considering or designing instruments to minimize response bias. (See page 110 for Addendum.)

Item and Instrument Rejection

The "bottom line" of item and instrument construction is whether respondents are willing to complete the survey instrument. Instrument rejection can take several forms: refusal to fill out the survey at all, omission of specific items, or failure to complete a questionnaire. Respondents can also answer randomly or in a certain pattern: all "1's," all "5's," all neutral points, or such repeated patterns as "1-2-3-4-5." Rejection can be due to the instrument itself or a variety of factors such as subject fatigue or anger about situations that have nothing to do with the survey; issues such as confidentiality; or failure to motivate or reassure subjects during the survey administration instructions. Instrument factors most likely to cause rejection are length, lack of interest, incomprehensibility, and threat.

People get tired and quit filling out questionnaires which are too lengthy. The number of items in the instruments reviewed averaged 173 and ranged from 29 to more than 700. Estimates of the amount of time needed to complete depended on the population being sampled and ranged from 10 to 15 seconds (executive and Navy officers) to 1 minute per item (Marine Recruits), with a conservative time of 20 seconds per item. Most consultant practitioners, and especially OESOs (Hinds, 1977; Sayre, 1977) felt the

surveys they had used were too long and considered 100 items and 1 hour to be the outer limit for survey length.

Lack of interest or salience is another cause for instrument rejection. People get bored when they do not perceive surveys to be relevant to their concerns or do not understand why they are taking these surveys, and thus tend to reject items that do not make intuitive sense to them (i.e., lack of "face validity"). It follows that the grounded theory approach of identifying the concerns or an organization's members and then "tailoring" a survey to reflect these concerns in the members' own language would maximize salience and face validity. Some authors suggest a movement away from universal instruments applicable to all organizational settings toward the development of contingent surveys applicable to specific people and organizations (Hellriegel & Slocum, 1974; Schneider, 1975). Administration instructions which stress the "what's in it for you" benefits to respondents can significantly increase motivation and lower rejection rates. (Godina, 1977)

Items which are incomprehensible cause people to get confused, careless, or irritated and therefore quit, for reasons discussed above.

A survey can appear threatening if people feel the information they are asked to provide will prove harmful to themselves or others. This does not appear to be a serious constraint to the use of work environment questionnaires if administration instructions stress confidentiality and the beneficial ways in which data collected will be used.

Unfortunately, little data on rejection rates or causes was available on most of the instruments reviewed. Moos (1974) found rejection rates ranged from 55 to 7 percent with a mean of 25 percent, among hospitalized mental patients (the 55 percent rejection rate was with very chronic schizophrenic patients). The Army's General Organization Questionnaire was initially rejected by 15 percent of respondents at one installation, a rate reduced to 3 percent by improved administration instructions (Godina, 1977). Affourtit (1977) reports a rejection rate of less than 1 percent for the Marine Corps "LEAP" survey. Rejection rates of 1 to 3 percent seem a reasonable objective for work environment and organizational climate questionnaires with normal subject populations.

Reliability and Validity

The American Psychological Association's "Standards for Educational and Psychological Tests" (1974) states that presentation of "evidence of reliability and validity" (is) essential for developing "any systematic basis for making inferences about characteristics of people." Taylor and Bowers (1972) argue that these standards should be applied to work environment questionnaires regarding any instrument "used in the making of decisions which ultimately may drastically affect the welfare of persons tested, both in individual cases and in the aggregate" (p. 81). Nearly all researchers who have commented on the organizational climate literature criticize the field for its low standards and lack of reliability and validity (Guion, 1973; Taylor & Bowers, 1972; Hellriegel & Slocum, 1974; James & Jones, 1974; Schneider, 1975).

The present study attempted to assess the reliability and validity of all instruments for which data were available. Tables 4 and 5 summarize these data. In the following discussion, it should be emphasized that "not reported" does not necessarily mean "does not exist." Many of the findings reported here are from unpublished sources, obscure technical reports, or telephone conversations with researchers. While it is the authors' impression that most work environment questionnaires lack reliability and validity statistics, data they were unable to find may exist.

Reliability

Reliability describes an instrument's accuracy or consistency: the degree to which it will give the same reading when used to measure the same thing more than once.

Three types of reliability are commonly cited: internal consistency (or split-half) reliability, test-retest ($time_1$ - $time_2$) reliability, and scale reliability.

Internal consistency reliability means that items which purport to measure the same variable in fact agree or correlate with one another. This is tested statistically by dividing the instrument (or a set of items measuring the same variable) into two parts (the split-half) and finding the correlation coefficient between responses on items in the two parts.

Test-retest reliability means that persons taking the test at two points in time will score approximately the same, assuming nothing has occurred during the time between the two tests which would cause people to respond differently.

Scale reliability means that the items which measure a given variable correlate with each other and with the total score for the variable. Correlations among individual items tend to be fairly low (r of .20 is considered good) but item-total correlations are much higher. Scale reliabilities can be increased by using items with more interval steps, and by using more items. For example, 30 dichotomous items may be needed to achieve a scale reliability of .80, but only 15 seven-point Likert items would be needed to attain the same level of reliability (Nunnally, 1967, p. 265). These standards may be impractical for work environment questionnaires, which tend to have only three to six items per variable.

Validity

Validity describes the extent to which an instrument measures something real, an assessment made by comparing its results to the results of other measures or to outcome criteria such as inspection scores and retention rates. Several types of validity are referred to in the measurement literature: face validity, content validity, construct validity, convergent validity, criterion validity, concurrent validity, and predictive validity.

Face validity means that the instrument sounds right or makes intuitive sense to users, that it uses the language and concepts of the sample

population with which it will be used. This quality has been referred to as salience in the discussion of item construction. For example, commanding officers' color preference might prove to be a good predictor of inspection scores, but no consultant could seriously propose to use this measure in a military organization because of its lack of face validity. Face validity has no scientific meaning, but is a critically important practical factor in gaining acceptance for any measure to be used in organizational effectiveness. It can be tested statistically, to a degree, by using the Thurstone rating method described earlier: Sample subjects rate each item on face validity on a two-point scale and items about which there is no substantial disagreement are discarded.

Content validity means that the instrument variables measure what they say they measure (e.g., that a variable labeled "standards" in fact asks questions such as, "To what extent does your supervisor set high standards for your work performance?"). This would seem an obvious point, but the instrument review found a surprising number of cases in which items included in variable factors had virtually no relation to variables they presumably measured. Nunnally (1967) notes that "the two major standards for insuring content validity are (1) a pre-presentative collection of items and (2) 'sensible' methods of test construction" (p. 81). In other words, common sense. Content validity can be estimated statistically, to some degree, by the Thurstone method (asking people), by examination of internal inconsistency reliabilities (on the assumption that if items correlate, they are probably measuring the same thing), and comparison with other measures of the same variable dimension, a topic to be discussed under construct and convergent validity.

Construct validity means that there is some independent evidence to confirm that the concept of construct measured by an instrument's variables really exists. This is important because behavioral science constructs such as "ego state" (psychology) or "team spirit" (organizational behavior) are hard to define and measure and hence are controversial. Guion (1973) argues, for example, that the whole construct of work environment or organizational climate is meaningless.

Construct validity is usually established by correlating one measure of a variable with another measure of the same variable. For example, Patchen (1965) established construct validity by comparing subordinates' rating of team spirit on a work environment questionnaire with the number of cars displaying the organization's bumper sticker in the company parking lot. The assumption in this case was that voluntary display of the corporate insignia was an indication of pride in belonging to the organization. Survey instrument scores can similarly be correlated with the results of interviews, other surveys, group sensing sessions, or outcome measures of comparable variables. This validation procedure is sometimes called convergent validity: If several independent measures converge, giving approximately the same score on a variable, they establish its construct or convergent validity.

Criterion validity means that a variable measure correlates with some "hard" outcome or criteria (for example, standards as measured by an organizational climate questionnaire with inspection scores). Criterion

validity can be established at two points in time: at the same time the
outcome is measured, in which case it is called concurrent validity, or
by predicting a future outcome, called predictive validity.

Concurrent validity is the most commonly cited validity measure for
work environment and organization climate surveys because it is easier to
get the data required for concurrent analyses. The three most common de-
signs encountered in this review were (1) correlation of instrument process
indices with outcome perceptions measured by the same instrument; (2) cor-
relation of survey indices with the results of several comparable organi-
zations (different plants making the same product, or destroyers with ap-
proximately the same crews and missions) on some outcome variable; and
(3) "split-half" designs, in which survey variable data on the best and
worst performing organizations (units ranked in the top and bottom 10 per-
cent on inspection scores) were compared. (It should be noted that the
first approach is not really a criterion validity design because the in-
strument indices are simply correlated with one another, not with an ob-
jectively observable outcome in the real world.)

Predictive validity designs provide much more stringent tests of in-
strument validity. In these designs, the organizational climate instrument
given at one point in time is correlated with organizational outcomes mea-
sured at some future point in time (usually 3 to 6 months, although some-
times as long as 3 years; Likert, 1973). This type of longitudinal analysis
is accomplished by use of "cross-lagged panel correlations" in the format
below (Campbell & Stanley, 1967; Kenny, 1975):
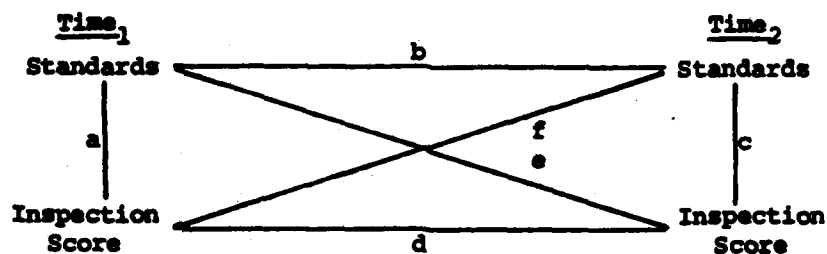
Both the climate survey measure (standards) and the "hard" outcome criteria
(inspection scores) are assessed at two points in time. Correlations "a"
and "c" would provide an indication of concurrent validity between the in-
strument and the criteria. Correlation "e," if it were significantly larger
than correlation "f," would provide evidence of predictive validity between
the instrument variable at one time and the outcome variable at a second
point in time. This analysis can also establish the causal directionality
of the relationship between the instrument variable and the criterion.
(Correlation coefficients by themselves measure the degree of association
between variables, but not the directionality of the relationship.) Causal
flow models such as that illustrated in Figure 2 are based on cross-lagged
panel studies of this kind.

Concurrent and predictive validity correlations tend to be much lower
than reliability coefficients: an r of .33 between a variable measure and
a criterion is considered good (Ghiselli, 1966). The amount of variance
in the criterion variable accounted for by the instrument variable can be

estimated by squaring the correlation coefficient. For example, a validity r of .33 for a work environment variable indicates that the variable accounts for approximately 10 percent ($.33^2 = .10$) of the variance in an organizational outcome. This may seem low, but if an organization's effort impacted on the work environment effectively enough to cause a 10 percent increase in retention rates, this would be a very significant outcome for a military organization. Figure A-1 illustrates the relationship between a change in an organizational climate variable and a change in an outcome variable.

If the strength of the relationship between a given variable and a performance outcome measure is known, an OESO consultant can estimate probable changes in performance outcomes from changes in variable scores on an organizational effectiveness instrument and identify the most efficient placement of organizational intervention resources to bring about desired changes.

For example, in Figure A-1, if an intervention (e.g., a team building workshop) increases a climate variable (e.g., team spirit) one standard deviation (σ) and it is known that $r = -.7$ between this team spirit variable and AWOL rates, one can predict that the intervention will reduce a client command's AWOL rate by .7 standard deviation (σ) below the mean AWOL rate for all commands.

If the cost of a results variable can be calculated (e.g., the cost of the work lost, disciplinary procedures for each person who is AWOL, or the loss in replacement and training dollars to the Army if a junior officer resigns), one can further develop benefit/cost and return on investment data for OE interventions by:

(a) estimating the change in the results variable from change in climate variables;

(b) calculating the dollar cost of the OE intervention using cost/applied man day, direct materials, travel, and overhead;

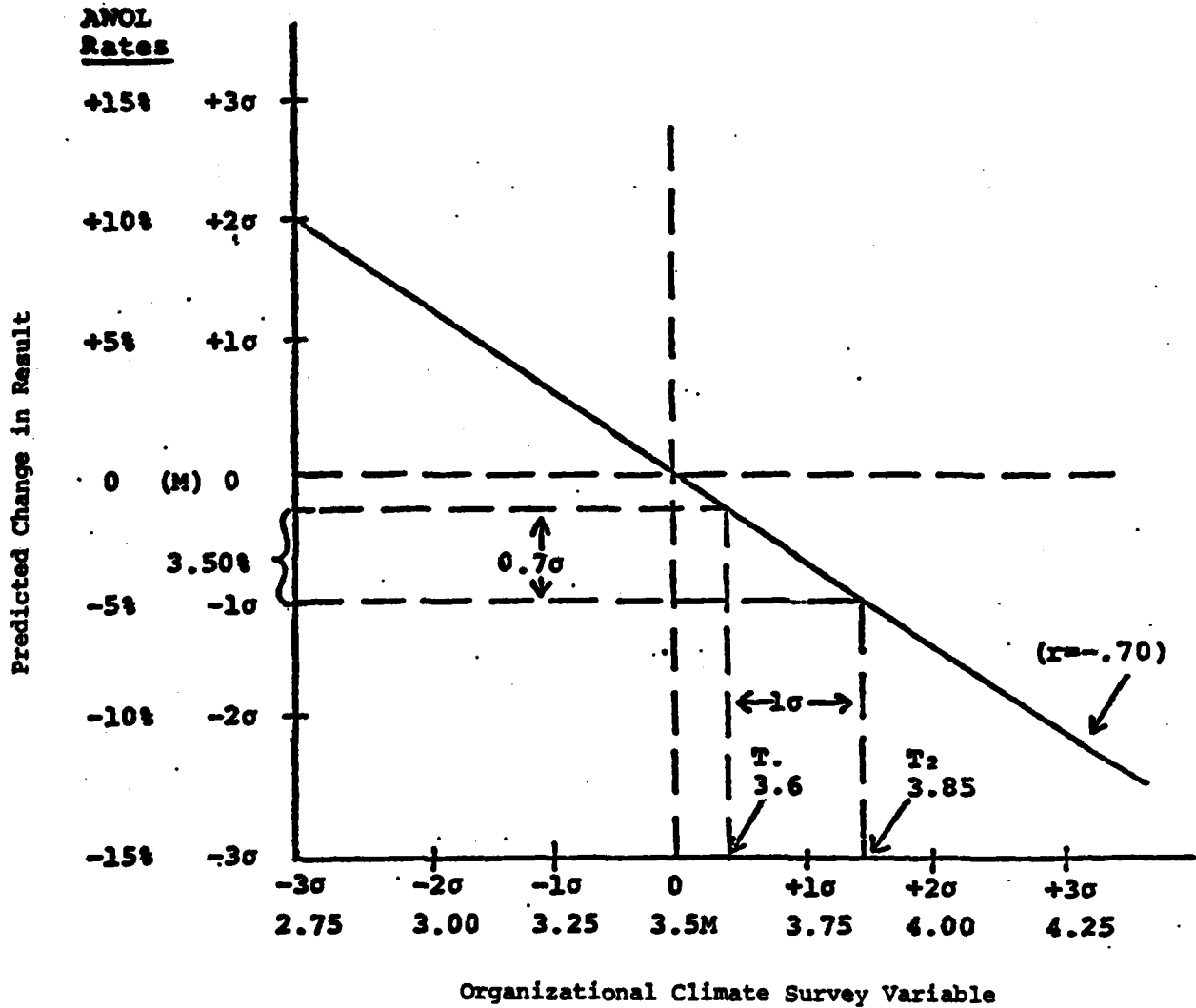(c) calculating the benefit/cost return on investment ratio

$$B/c = \frac{e\ B}{cost}$$

where B/c = benefit/cost ratio (return on investment)

e B = estimated benefits of OE intervention (from change in climate variable)

c = cost of the OE intervention.

Figure A-1. Predicting unit effectiveness results from Organizational Climate Variable scores.

Organizational Climate Survey Variable

M = Mean AWOL Rate/Organizational Climate Variable Score for all commands.

INSTRUMENTS REVIEWED

Instrument	Reference
Agency Climate Questionnaire (ACQ)	Bartlett, C. M. & Schneider, B. Individual differences & organizational climate: Measurement of organizational climate by the multi-trait, multi-rater matrix. Personnel Psychology, 1970, 23, 493-512.
Air Force Organizational	Hendrix, W. H. Contingency approaches to leadership: A review & synthesis. Lackland Air Force Base, TX: Occupational & Manpower Research Division, June 1976.
Blake and Mouton (with rewarding and expansion)	Greiner, L. E., Pavlleitch, D. P., & Barnes, L. B. Organizational climate in a government agency. Taguiri, R. & Litwin, G. H. (Eds.). Organizational climate: Explorations of a concept. Boston: Harvard University Press, 1968.
Business Organization Climate Index	Mansfield, R. & Payne, R. L. Relationships of perceptions of organizational climate to organizational structure context & hierarchial position. Administrative Science Quarterly, 1973, 18, 515-526. Payne, R. & Pheysey, D. Stern's organizational climate index: A reconceptualization & application to business organizations. Organizational Behavior & Human Performance, 1971, 6, 77-98. Stern/Aston studies.
Campbell & Pritchard Instrument	Karasick, B. & Pritchard, R. The effects of organizational climates on managerial job performance and job satisfaction. Organizational Behavior & Human Performance, 1973, 9, 110-119.
Employee Motivation and Morale	Chen, P. Some questionnaire measures of employee motivation and morale. Ann Arbor: Institute for Social Research, University of Michigan, 1975.

Instrument	Reference
Encounter Group Questionnaires--Leader Behavior Checklist	Lieberman, M., Yalom, J., & Miles, M. Encounter groups: First facts. New York: Basic Books, 1973.
Forum Performance Audit	Forum performance audit. Boston: The Forum Corporation, 1974.
General Organizational Questionnaire (GOQ), Army	General organizational questionnaire manual. Fort Ord, CA: U.S. Army Administration Center, Organizational Effectiveness Training Center, 1976.

Organizational effectiveness survey data processing system (survey) users manual (interim version). Fort Ord, CA: U.S. Army Administration Center, Organizational Effectiveness Training Center, 1976. |
| Halpin and Crofts (adapted) | Friedlander, F. & Margulies, N. Multiple impacts of organizational climate & individual value systems upon job satisfaction. Personnel Psychology, 1969, 22, 171-183. |
| Human Resource Management Survey | Bowers, D. G. & Seashore, S. E. Predicting organizational effectiveness with a four-factor theory of leadership. Administrative Science Quarterly, 1966, 11, 238-263.

Likert, R. L.

Munger, M., Spencer, L., & Thomson, T. The U.S. Navy human resource management (Shore) cycle: A manual for consultants. Boston: McBer & Co., 1976.

Thomas, E. NPRDC.

Yellow book. Boston: McBer & Co. |
| Job Description Inventory | Hackman, J. R. & Lawler, E. E., III. Employee reactions to job characteristics. Journal of Applied Psychology Monograph, 1971, 55, 259-286. |

Instrument	Reference
Job Diagnostic Survey	Hackman, J. R. & Oldham, G. R. _An instrument for the diagnosis of jobs and the evaluation of job redesign projects_ (Technical Report No. 4). New Haven, CT: Yale University, Department of Administrative Sciences, 1974.
Leadermatch (four instruments)	Fiedler, F. E. Validation & extension of the contingency model of leadership effectiveness: A review of empirical findings. _Psychology Bulletin_, 1971, _76_, 128-148.
	Fiedler, F. E., Mahan, & Chermers. _Leadermatch_. University of Washington, 1976.
Leadership Evaluation and Analysis Program--U.S. Marine Corps (LEAP)	Affourtit, T. D. _The operational feasibility of the leadership evaluation & analysis program (LEAP): Final report_ (Technical Report 77-3). Rockville, MD: Interaction Research Institute, March 1977.
	Manual for the leadership analysis form & LEAP interaction inventory. Washington, D.C.: Headquarters, U.S. Marine Corps, 1976.
Litwin & Stringer (form I)	Downey, H. K., Hellriegal, D., Phelps, M., & Slocum, J. W. Organizational climate: A comparative analysis. _Journal of Business Research_, 1974, _2_, 233-248.
Litwin & Stringer	_Empirical study combining measures of organizational climate, organizational practices, job satisfaction & job performance._
	Lafollette, W. R. & Sims, H. P. Is satisfaction redundant with organizational climate? _Organizational Behavior & Human Performance_, 1975, _13_, 257-278.
	Meyer, H. H. Achievement motivation & organizational climates. In R. Tagerei & G. H. Litwin (Eds.), _Organizational climate: Explorations of a concept_. Boston: Harvard University Press, 1968.

Instrument	Reference
McBer Organizational Inventory	Becklean, W. R. & Kinkaed, M. D. The organizational audit. Boston: Harvard University Graduate School of Business Administration, 1968.
	Blake & Norton. Conflict resolution.
	Lawrence, P. R. & Lorsch, J. W. Studies in organizational design. Homewood, IL: Richard D. Irwin, Inc. & The Dorsey Press, 1970.
	Litwin, G. H. & Stringer, R. A., Jr. Motivation & organizational climate. Cambridge: Harvard University Graduate School of Business Administration, Division of Research, 1968.
	McClelland, D. Motives.
	Spencer, L. M. The McBer organizational inventory--technical note. Boston: McBer & Co., 1975.
McBer Work Analysis Questionnaire	McClelland. Social motives.
	Work analysis questionnaire. Boston: McBer & Co., 1976.
Measure of Military Attitudes	Bowers, D. G., Holz, R. F., & Stout, R. Measures of military attitudes. Arlington, VA: U.S. Army Research Institute for the Behavioral & Social Sciences, 1977.
Measure of Morale	Borman, W. C. The development of measures of morale. In O.D. program: Instrumentation, implementation & methodological issues. Symposium presented at the meeting of the American Psychological Association, Chicago, September 1975.
Michigan Organizational Assessment Package	Michigan organizational assessment package: Progress report II. Ann Arbor: University of Michigan, Institute for Social Research, August 1975.
Military Company Environment Inventory	Moos, R. MCET manual. Palo Alto, CA: Stanford University, Department of Psychiatry, Social Ecology Laboratory, 1974.

Instrument	Reference
Military Leadership Survey (MLBS)	Development of a measure of Army leadership climate: The military leadership survey. U.S. Army Research Institute for Behavioral & Social Sciences, December 1974.
	Ohio studies on leadership.
Motivation & working relations of scientists & engineers questionnaire	Pelz, D. & Andrews, F. Scientists in organizations: Productive climates for research & development. Ann Arbor: University of Michigan, Institute for Social Research, 1976.
Occupational Attitude Inventory	Occupational Attitude Inventory. Lackland Air Force Base, TX: USAF Human Resources Laboratory, May 1975.
OCDQ (& Cattell Personality Inventory/Organizational Structure Instrument)	Bishop, L. K. & George, J. R. Relationship of organizational structure & teacher personality characteristics to organizational climate. Administrative Science Quarterly, 1971, 16, 467-475.
OCDQ & Profile Schools	Hall, J. W. A comparison of Halpin & Croft's organizational climates and Likert & Likert's organizational systems. Administrative Science Quarterly, 1972, 17, 586-590.
Organization Development Survey, Office of the Deputy Chief of Staff for Personnel, December 1975	Washington, D.C.: Department of the Army, DCSPERS, 1975.
Organizational Climate for Schools	Halpin, A. Theory & research in administration. New York: Macmillan & Co., 1966.
Organizational Description Questionnaire	Burns, T. & Stalker, G. The management of innovation. London: Tavistock Publications, Ltd., 1961.
	House, R. J. & Rizzo, J. R. Toward the measurement of organizational practices: Scale development & verification. Journal of Applied Psychology, 1972, 56(5), 388-396.
	McGregor (Theory x/y)

Instrument	Reference
Organizational Effectiveness Training Center, Fort Ord, CA, 1976	
Profile of Organizational Characteristics	Likert, R. L. The human organization. New York: McGraw-Hill, 1967.
Satisfaction and Desire Measures, Alderfer ERG	Alderfer, C. P. Existence relatedness & growth. New York: The Free Press, 1972.
Schneider & Hall	Hall, D. T. & Schneider, B. Toward specifying the concept of work climate: A study of Roman Catholic priests. Journal of Applied Psychology, 1972, 56(6), 447-455.
Stern's College Characteristics Index	Murray & Lewin Stern, G. G. People in context: Measuring personality, environment, congruence in education & industry. New York: John Wiley & Sons, 1970.
Supervisory Behavior Description (Fleishman)	Fleishman, E. A leader description for industry. In Stogdill & Coons (Eds.), Leader behavior: Its description & measurement. Columbus, OH: Ohio State University, Bureau of Business Research, 1957.
Survey of Management Climate	Tripex Industries (TRIPX). Survey of Management Climate. Hay Assoc., 1976.
Ward Atmosphere Scale	Moos, R. H. Evaluating treatment environments--A social ecological approach. New York: John Wiley & Sons, 1974. Moos, R. H., & Horts. Assessment of the social atmospheres of psychiatric wards. Abnormal Psychology, 1968, 20, 442-449.
Work Analysis Questionnaire	Klemp, G. O. Work analysis questionnaire. Boston: McBer & Co., 1976.
Work Environment Questionnaire	Cohen, S. L. & Turney, J. R. The development of a work environment questionnaire for the identification of organizational problem areas in specific Army work settings. U.S. Army ARIBSS, June 1976.

Instrument	Reference
Work Environment Questionnaire--Seneca Army Depot	Work environment questionnaire--Seneca Army depot. Washington, D.C.: Department of the Army (Despers), Army Research Institute.
Work Environment Scale	Insel & Moos, R. H. The work environment scale. Palo Alto, CA: Stanford University, Social Ecology Laboratory, Department of Psychiatry, 1972.
	Moos, R. H. Evaluating treatment environments. New York: John Wiley & Sons, 1974.

SOURCES EXAMINED

Instrument Source:

Heslin, R., Pfeiffer, J. W., <u>Instrumentation in human relations train-
ing</u>, University Associates, 1973.

Instruments:

General
     Fundamental Interpersonal Relations--Behavior
     Fundamental Interpersonal Relations--Feeling
     Survey of Interpersonal Values
     Interpersonal Check List
     Interpersonal Rating Form
     Psychological Audit for Interpersonal Relations
     The A-S Reaction Study in Personality

Group Dynamics
     Hill Interaction Matrix--B
     Hill Interaction Matrix--Group
     Reactions to Group Situations
     Group Leadership Questionnaire
     Helping Relationship Inventory
     Group Encounter Survey
     Team Effectiveness Survey
     Group Dimensions Descriptions Questionnaire

Organizational Climate
     Organization Health Survey
     Organizational Climate
     Educational Values
     Organizational Climate Index
     Organizational Climate Questionnaire

Management/Leadership Style
     The Orientation Inventory
     A Survey of Life Orientations
     Management Style Diagnosis Test
     X-Y-Z Test
     Leadership Appraisal Survey
     Management Appraisal Survey
     Leadership Opinion Questionnaire
     The Leadership Ability Evaluation

Supervisor-Subordinate Relations
    Leadership: Employee-Orientation and Differentiation Questionnaire
    Rate Your Boss as a Leader   .
    Personnel Relations Survey
    Management of Motives Index
    Work Motivation Inventory
    Supervisory Index

Instrument Source:

    Moos, R. H., <u>Evaluating treatment environments--A social ecological
    approach</u>, John Wiley & Sons, 1974.

Instruments:

    Perception of Ward
    Staff Opinion Scale
    Philosophy of Treatment Form
    Opinions about Mental Illness Scale
    Characteristics of Treatment of Environments Scale
    Ward Initiative Scale
    Ward Information Form
    Correctional Institution Environment Scale
    Resident Initiative Scale
    Group Environment Scale
    Climate Questionnaire
    Community Oriented Programs Environment Scale
    Institutional Functioning Inventory
    University Resident Environment Scale
    Classroom Environment Scale
    Work Environment Scale
    Family Environment Scale
    Learning Environment Inventory
    Dimensions of Group Process
    Organizational Climate Index

Instrument Source:

    Mahler, W. R., <u>Diagnostic studies</u>, Addison-Wesley Publishing Co., 1974.

Instruments:

    The Coaching Practices Survey
    The Organizational Characteristics Survey
    The Barometer Survey
    Authority-Analysis Study

122

Employee Performance Survey
Personnel Role and Relationship Survey

Instrument Source:

Athanasion, R., Head, K. B., & Robinson, J. P., <u>Measures of occupa-
tional attitudes and occupational characteristics</u>, Ann Arbor, Insti-
tute for Social Research: University of Michigan, 1976.

Instruments:

Job Description Index
Index of Job Satisfaction
Factors for Job Satisfaction and Job Dissatisfaction
SRA (Employee) Attitude Survey
IRC Employee Attitude Scales
Index of Employee Satisfaction
Job Satisfaction Scale
Job Dimensions Blank
Job Satisfaction Index
Job Satisfaction
Tear Ballot
Employee Morale Scale
Work Satisfaction and Personal Happiness
Need Fulfillment Questionnaire for Management
Managerial Job Attitudes
Job Attitudes and Job Satisfaction of Scientists
Attitudes of Scientists in Organizations
Job Satisfaction Inventory
Supervisory Behavior Description
Attitude Toward the Supervisor
Satisfaction with Supervisor
Attitudes Toward the Supervisor
Employee Opinion Survey
Need Satisfaction in Work
About Your Company
Group Morale Scale
Indices of Alienation
Alienation from Work
Job-Related Tension
Job Motivation Index
Identification with the Work Organization
Defining Dimensions of Occupation
Meaning of Work Scales
Meaning of Work
Leadership Opinion Questionnaire
The SRA Supervisory Index
Leadership Practices Inventory
How Supervise?
A Proverbs Test for Supervisor Selection

A Managerial Key for the CPI
Managerial Scale for Enterprise Improvement
Organizational Control Graph
Profile of Organizational Characteristics
Union and Management Attitudes Toward Each Other
IRC Union Attitude Scale
Index of Pro-Labor Orientation
Pro-Labor Attitude Error-Choice Tests
Attitudes Toward Labor and Management
Attitudes Toward Working for the Government
Attitude Toward Automation
Attitude Toward Employment of Older Persons
Opinions about Work of the Mentally Ill

Instrument Source:

Earle, R. B., Jr., Lake, D. G., & Miles, M. B. (Eds.), Measuring Human
Behavior, Teachers College, Columbia University, 1973.

Instruments:

Fundamental Interpersonal Relations Orientation--Behavior
Group Dimensions Description Questionnaire
Interaction Process Analysis
Interpersonal Competence Scoring System
Meetings
Member-to-Leader Scoring System
Leader Behavior Description Questionnaire
Least Preferred Co-Worker Scales
Organizational Behavior Describer Survey
Organizational Climate Description Questionnaire
Organizational Control Questionnaire
Perception of Organization Chart
Pittsburgh Administrative Review
Problem Analysis Questionnaire
Profile of Organizational Characteristics
Reactions to Group Situations Test
Responsibility, Authority and Delegation of Authority Scales
Teaching Situation Reaction Test
Handbook of Research Design and Social Measurement (2nd ed.)
Improving Educational Assessment and an Inventory of Measures of Af-
    fective Behavior
Inventory of Drug Abuse Research Instruments
Measures of Occupational Attitudes and Occupational Characteristics
Measures of Political Attitudes
Measures of Social Psychological Attitudes
Mirrors for Behavior
Objective Personality and Motivation Tests

Scales for the Measurement of Attitudes
SCALES/RIQS: An Inventory of Research Instruments
Sixth Mental Measurements Yearbook
Sociological Measurement: An Inventory of Scales and Indices
Tests in Print
Unobtrusive Measures

APPENDIX D

REFERENCES

Abrahams, N. H., & Dann, J. E. Occupational scales of the Navy vocational interest inventory: I. Development. San Diego, CA: Navy Personnel Research and Development Center, October 1973.

Affourtit, T. D. Contemporary Marine Corps leadership issues II: 2nd Marine Division, FMF. (Technical Report 77-4.) Rockville, MD: Interaction Research Institute, 1977.

Affourtit, T. D. Contemporary Marine Corps leadership issues II: 2nd Marine Division, FMF, executive summary. Rockville, MD: Interaction Research Institute, April 1977.

Affourtit, T. D. The leadership evaluation and analysis program (LEAP): Manual for the leadership analysis form and the LEAP interaction inventory. Washington, D.C.: Headquarters, U.S. Marine Corps, March 1976.

Affourtit, T. D. Measuring the impact of the Marine Corps' leadership (human relations) program: An empirical evaluation study. (Technical Report 77-2.) Rockville, MD: Interaction Research Institute, 1977.

Affourtit, T. D. The operational feasibility of the leadership evaluation and analysis program (LEAP): Final report. (Technical Report 77-3.) Rockville, MD: Interaction Research Institute, March 1977.

Akula, W. G. Interaction and role congruency in the peer rating process: An empirical study. Unpublished doctoral dissertation, New York University, 1969.

Alderfer, C. P. Existence, relatedness, and growth. New York: Free Press, 1972.

Altman, I., & McGrath, J. E. Small group research: A synthesis and critique of the field. New York: Holt, Rinehart & Winston, 1966.

American Psychological Association. Technical recommendations for psychological tests and diagnostic techniques. Psychological Bulletin, 1954, 51 (2, Part 2).

Andrews, F. M., & Pelz, D. C. Scientists in organizations. Ann Arbor: University of Michigan, Institute for Social Research, 1966.

Argyris, A. Intervention theory and method. A behavioral science view. Philippines: Addison-Wesley Publishing Company, Inc., 1970.

Ash, P. The SRA employee inventory—a statistical analysis. Personnel Psychology, 1954, 7, 337-364.

Athanasion, R., Head, K. B., & Robinson, J. P. Measures of occupational attitudes and occupational characteristics. Ann Arbor: University of Michigan, Institute for Social Research, 1976.

Ayres, D. B., & Clement, S. D. A matrix of organizational leadership dimensions. U.S. Army Administration Center, 1976, Monograph #8.

Babbie, E. R. Survey research methods. Belmont, CA: Wadsworth Publishing Company, 1973.

Bales, R. F. Personality and interpersonal behavior. New York: Holt, Rinehart and Winston, Inc., 1970.

Bales, R. F., Borgatta, E. F., & Hare, A. P. (Eds.). Small groups. Studies in social interaction. New York: Alfred A. Knopf, 1966.

Bales, R. F. Interaction process analysis: A method for the study of small groups. Reading, MA: Addison-Wesley Publishing Co., Inc., 1950.

Bartlett, C. J., & Schneider, B. Individual differences and organizational climate: Measurement of organizational climate by the multi-tract, multi-rater matrix. Personnel Psychology, 1970, 23, 493-512.

Bauer, R. G., Holz, R. F., & Stout, R. Measures of military attitudes. Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, 1977.

Becklean, W. R., & Kinkaed, M. D. The organizational audit. Cambridge: Harvard Business School, 1968.

Billingsley, K., Golembiewski, R. T., & Yeager, S. Measuring change and persistence in human affairs: Types of change generated by OD designs. Douglas McGregor Memorial Award-Winning paper, 1975.

Bishop, L. K., & George, J. R. Relationship of organizational structure and teacher personality characteristics to organizational climate. Administrative Science Quarterly, 1971, 16, 467-475.

Blanchard, K. H., & Hersey, P. Management of organizational behavior. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1972.

Borman, W. C. The development of measures of morale. In OD Program: Instrumentation, implementation, and methodological issues. Symposium presented at the meeting of the American Psychological Association, Chicago, September 1975.

Borman, W. C., Dowell, B. E., Dunnette, M. D., Hopp, M. A., Johnson, P. D., & Motowidlo, S. J. Motivation, satisfaction and morale in Army careers: A review of theory and measurement. (ARI Technical Report TR-76-A7.) Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, 1976.

Bottenberg, R. A., & Christal, R. E. Grouping criteria--a method which retains maximum predictive efficiency. The Journal of Experimental Education, 1968, 36, 28-34.

Bowers, D. G., Holz, R. F., & Stout, R. Measures of military attitudes. Arlington, VA: Army Research Institute for the Behavioral and Social Sciences, Research Problem Review, April 1977.

Bowers, D. G. OD techniques and their results in 23 organizations. The Michigan ICL Study. Journal of Applied Behavioral Science, 1973, 9, 24-43.

Bowers, D. G. Systems of organization. Management of the human resource. Ann Arbor: The University of Michigan Press, 1976.

Bowers, D. G., & Franklin, J. L. Survey-guided development: Data based organizational change. Ann Arbor: University of Michigan, Institute for Social Research, 1975.

Bowers, D. G., & Seashore, S. E. Predicting organizational effectiveness with a four factor theory of leadership. Administrative Science Quarterly, 1966, 11, 238-263.

Bowers, D. G., & Taylor, J. C. Survey of organizations. Ann Arbor: University of Michigan Press, 1972.

Bradburn, N. M., & Sudman, S. Response effects in surveys. Chicago: Aldine Publishing Company, 1974.

Brayfield, A. H., & Rothe, H. F. An index of job satisfaction. Journal of Applied Psychology, 1951, 35, 307-311.

Brown, D. K. Evaluation of Navy human relations training for civilian and military supervisors and managers. A conceptual framework and a case study. McLean, VA: Human Sciences Research, Inc., 1977.

Burns, T., & Stalker, G. The management of innovation. London: Tavistock Publications Ltd., 1961.

Campbell, D. T. Leadership and its effect upon the group. Columbus, OH: Ohio State University, 1965.

Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally & Co., 1967.

Campbell, J. P., Dunnette, M., Lawler, E. E., III, & Weick, K. E., Jr. Managerial behavior, performance and effectiveness. New York: McGraw-Hill, 1970.

Chave, E. J., & Thurstone, L. L. The measurement of attitudes. Chicago: University of Chicago Press, 1929.

Chun, K., Cobb, S., & French, Jr. *Measures for psychological assessment:*
A guide to 3,000 original sources and their applications. Ann Arbor:
University of Michigan, Institute for Social Research, 1976.

Cohen, A. R. *Attitude, change and social fluence.* New York: Basic
Books, 1964.

Cohen, S. L. *Overview of the OD research program and its instrumentation.*
Paper presented at the meeting of the American Psychological Associa-
tion, Chicago, September 1975.

Cohen, S. L., & Turney, J. R. *Results of an organizational diagnostic*
survey of an Army field facility work environment. Arlington, VA:
U.S. Army Research Institute for the Behavioral and Social Sciences,
January 1976.

Crawford, K. S., & Thomas, E. D. *Human resources management and non-*
judicial punishment rates on Navy ships. San Diego, CA: Navy Per-
sonnel Research and Development Center, August 1975.

Curry, Captain R. Army Organizational Effectiveness Staff Officer (OESO).
Fort Riley, KN: Personal communication, June 20-23, 1977.

Dawis, R. V., Lofquist, L. H., & Weiss, D. J. *Minnesota studies in voca-*
tional rehabilitation, 23. A theory of work adjustment. Minneapolis,
MN: Industrial Relations Center, University of Minnesota, 1968.

Development of a measure of Army leadership climate: The military leader-
ship survey. Arlington, VA: U.S. Army Research Institute for the
Behavioral and Social Sciences, December 1974.

Dewhirst, H. D. Impact of organizational climate on the desire to manage
among engineers and scientists. *Personnel Journal,* 1971, 50, 196-203.

Downey, H. K., Hellneigel, D., Phelps, M., & Slocum, J. W. Organizational
climate: A comparative analysis. *Journal of Business Research,* 1974,
2, 233-248.

Downey, R. G. *Development of a measure of Army leadership climate: The*
military leadership behavior survey. Arlington, VA: U.S. Army Re-
search Institute for the Behavioral and Social Sciences, December
1974.

Downey, R. G., Duffy, P. J., & Shiflett, S. Locus of control: Dimension-
ality and predictability using Likert scales. *Journal of Applied*
Psychology, 1977, 62(2), 214-219.

Drexler, J. A. *The human resource management survey: An item analysis.*
Ann Arbor: University of Michigan, Institute for Social Research,
Technical Report, July 1974.

Drexler, J. A. Personal communication. Ann Arbor: University of Michi-
gan, Institute of Social Research, to Navy Bureau of Personnel, Au-
gust 15, 1973.

130

Drexler, J. A. Personal communication. Ann Arbor: University of Michigan, Institute of Social Research, to Navy Bureau of Personnel, May 7, 1973.

Drexler, J. A. Personal communication. Ann Arbor: University of Michigan, Institute of Social Research, to Navy Bureau of Personnel, September 14, 1973.

Dunnette, M. Personal selection and placement. Belmont, CA: Wadsworth, 1966.

Earle, R. B., Jr., Lake, D. G., & Miles, M. B. Measuring human behavior. New York: Teachers College, Columbia University, 1973.

Evans, M. G. Conceptual and operational problems in the measurement of various aspects of job satisfaction. Journal of Applied Psychology, 1969, 53, 93-101.

Fiedler, F. E. A theory of leadership effectiveness. New York: McGraw-Hill, 1967.

Fiedler, F. E. Validation and extension of the contingency model of leadership effectiveness: A review of empirical findings. Psychology Bulletin, 1971, 76, 128-148.

Fiedler, Mahan, & Chermers. Leadermatch. University of Washington, 1976.

Flanagan, J. C. The critical incident technique. Psychological Bulletin, 1954, 51(4).

Fleishman, E. A leader description for industry. In Stogdill & Coons (Eds.), Leader behavior: Its description and measurement. Columbus, OH: Ohio State University, Bureau of Business Research, 1957.

Forehand, G. A., & Gilmer, B. Environmental variation in studies of organizational behavior. Psychological Bulletin, 1964, 62, 361-382.

Forum performance audit. Boston: The Forum Corporation, 1974.

Franklin, J. L. A path analytic approach to describing causal relationships among social-psychological variables in multi-level organizations. Unpublished doctoral dissertation, University of Michigan, 1973.

Franklin, J. L., & Spencer, G. L. Organizational functioning: A manual for concepts training in the Navy. Ann Arbor: University of Michigan, Institute for Social Research, December 1, 1973 to November 30, 1974.

Fredericksen, N., Jensen, O., & Beaton, A. E. Prediction of organizational behavior. Elmsford, NY: Pergamon, 1972.

Friedlander, F., & Margulies, N. Multiple impacts of organizational cli-
     mate and individual values systems upon job satisfaction. Personnel
     Psychology, 1969, 22, 171-183.

General organizational questionnaire. Fort Ord, CA: U.S. Army Adminis-
     tration Center, Organizational Effectiveness Training Center, 1976.

General organizational questionnaire manual. Fort Ord, CA: U.S. Army
     Administration Center, Organizational Effectiveness Training Center,
     February 1975.

Georgopoulos, B. G., & Mann, F. C. The community general hospital. New
     York: Macmillan, 1962.

Ghiselli, E. E. The validity of occupational aptitude tests. New York:
     John Wiley & Sons, 1966.

Glaser, B. G., & Strauss, A. L. The discovery of grounded theory: Strate-
     gies for qualitative research. Chicago: Aldine Publishing Co., 1967.

Glaser, E. M., Izard, C. E., Chenery, M. F. Improvement in the quality
     of worklife and productivity. Los Angeles: Human Interaction Re-
     search Institute, 1976, 96. (NTIS, Springfield, VA, 22151)

Glass, G. V. Primary, secondary and meta-analysis of research. Paper pre-
     sented at the meeting of the American Education Research Association,
     San Francisco, April 1976.

Godina, Major P. Army Organizational Effectiveness Staff Officer (OESO).
     Fort Riley, KN: Personal communication, June 20-23, 1977.

Goldman, N. L., & Segal, D. R. (Eds.). The social psychology of military
     service. Sage Research Progress Series on War, Revolution, and Peace
     Keeping, 6. Beverly Hills, CA: Sage Publications, Inc., 1976.

Golembiewski, R. Organizational properties and managerial training:
     Testing alternative models of attitude change. Academy of Manage-
     ment Journal, 1970, 13, 13-34.

Golembiewski, R., & Carrigan, S. The persistence of laboratory-induced
     changes in organizational styles. Administrative Science Quarterly,
     1970, 15, 330-340.

Golembiewski, R., & Munzenrider, R. Persistence and change: A note on
     the long-term effects of an O.D. program. Academy of Management
     Journal, 1973, 16, 149-153.

Golembiewski, R., Munzenrider, R., Blumbery, A., Carrigan, S., & Mead, W.
     Changing climate in a complex organization: Interactions between a
     learning design and an environment. Academy of Management Journal,
     1971, 14, 465-483.

Golman, N. L., & Segal, D. R. (Eds.). The social psychology of military
     service. Beverly Hills, CA: Sage Publications, 1976.

Gould, R. B. Longitudinal inferences of job attitude and tenure relation-ships from cross-sectional data. Lackland Air Force Base, TX: Occu-pational and Manpower Research Division, July 1976.

Gould, R. B. Review of an Air Force job satisfaction research project: Status report through September 1976. Lackland Air Force Base, TX: Occupation and Manpower Research Division, December 1976.

Gould, R. B., & Christal, R. E. Varsel: Variable selection for multiple-purpose prediction systems in the absence of external criteria. Brooks Air Force Base, TX: Air Force Human Resources Laboratory, Air Force Systems Command, May 1976.

Greenbaum, C. W., Rogorsky, I., & Shalit, B. The military psychologist during wartime: A model based on action research and crisis inter-vention. The Journal of Applied Behavioral Science, 1977, 13(1).

Greiner, L. E., Parlleitch, D., & Barnes, L. B. Organizational climate in a government agency.

Guilford, J. P. Psychometric methods. New York: McGraw-Hill, 1954.

Guion, R. M. A note on organizational climate. Organizational Behavior and Human Performance, 1973, 9, 120-125.

Hackman, J. R., & Lawler, E. E., III. Employee reactions to job charac-teristics. Journal of Applied Psychology Monograph, 1971, 55, 259-286.

Hackman, J. R., & Oldham, G. R. Motivation through the design of work: Test of a theory. Technical Report No. 6, Department of Administra-tive Sciences, Yale University, 1974.

Hackman, J. R., Lawler, E. E., III, & Porter, L. W. Behavior in organi-zations. New York: McGraw-Hill, 1975.

Hall, D. T., & Schneider, B. Organizational climates and careers. New York: Seminar Press, 1973.

Hall, D. T., & Schneider, B. Toward specifying the concept of work cli-mate: A study of Roman Catholic priests. Journal of Applied Psy-chology, 1972, 56(6), 447-455.

Hall, J. W. A comparison of Halpin and Croft's organization climates and Likert & Likert's organizational systems. Administrative Science Quarterly, 1972, 17, 586-590.

Halpin, A. Change and organizational climate. Journal of Educational Administration, 1967, 5, 5-25.

Halpin, A. W. Theory and research in administration. New York: Mac-millan, 1966.

Hand, H. H., Richards, M. D., & Slocum, J. W., Jr. Organizational climate and the effectiveness of a human relations training program. *Academy of Management Journal*, 1973, 16, 185-195.

Hare, A. P. *Small group research*. New York: The Free Press, 1962.

Hare, A. P., Borgatta, E. F., & Bales, R. F. (Eds.). *Small groups. Studies in social interaction*. New York: Alfred A. Knopf, 1966.

Hausser, D. L., Pecorella, P. A., & Wissler, A. L. *Survey-guided development: A manual for consultants*. Ann Arbor: University of Michigan, Institute for Social Research, June 1974.

Hellriegal, D., & Slocum, J. W. Organizational climate: Measures, research and contingencies. *Academy of Management Journal*, 1974, 17(2).

Hendrix, W. H. *Contingency approaches to leadership: A review and synthesis*. (AFHRL-TR-16-17, AD-A028 485.) Lackland Air Force Base, TX: Occupational and Manpower Research Division, Air Force Human Resources Laboratory, June 1976.

Herzberg, F. *Work and the nature of man*. New York: The World Publishing Company, 1966.

Herzberg, F., Mausner, B., & Snyderman, B. B. *The motivation to work*. New York: Wiley, 1959.

Heslin, R., & Pfeiffer, J. W. *Instrumentation in human relations training*. LaJolla, CA: University Associates, 1973.

Hickerson, K. A., Hazel, J. T., & Ward, J. H., Jr. *A causal analysis of relationships between performance and satisfaction in eight airman specialties*. (AFHRL-TR-75-57, AD-A020 542.) Lackland Air Force Base, TX: Occupational and Manpower Research Division, Air Force Human Resources Laboratory, October 1975.

Hinds, Major P. Army Organizational Effectiveness Staff Officer (OESO). Fort Carson, CO: Personal communication, July 11-17, 1977.

Hinrichs, J. R. A replicated study of job satisfaction dimensions. *Personnel Psychology*, 1968, 21(4), 479-500.

Hollander, E. P. *Leadership and social exchange processes*. State University of New York at Buffalo, Psychology Department, September 1976. (Technical Report #2).

Hoppock, R. *Job satisfaction*. New York: Harper, 1935.

House, R. J., & Rizzo, J. R. Toward the measurement of organizational practices: Scale development and verification. *Journal of Applied Psychology*, 1972, 56(5), 388-396.

Hyman, H. Survey design and analysis. *Principles, cases, and procedures*. New York: The Free Press, 1955.

Insel & Moos. The work environment scale. Palo Alto, CA: Stanford University, Social Ecology Laboratory, Department of Psychiatry, 1972.

Interviewer's manual, revised edition. Ann Arbor: University of Michigan, Institute for Social Research, Survey Research Center, 1976.

Jacobs, T. O. Leadership and exchange in journal organizations. Alexandria, VA: Human Resources Research Organization, 1971.

Jago, A. G., & Vroom, V. H. Predicting leader behavior from a measure of behavioral intent. (Technical Report #10.) New Haven, CT: Yale University School of Organization and Management, July 1976.

James, L. R., & Jones, A. P. Organizational climate: A review of theory and research. Psychological Bulletin, 1974, 81, 1096-1112.

Janowitz, M. (Ed.). The new military. New York: Norton Library, 1969.

Janowitz, M. The professional soldier. Illinois: The Free Press, 1960.

Janowitz, M., & Little, R. W. Sociology and the military establishment. Beverly Hills, CA: Sage Publications, Inc., 1974.

Johanesson, R. E. Some problems in the measurement of organizational climate. Organizational Behavior and Human Performance, 1973, 10, 118-144.

Johnson, G. H. An instrument for the measurement of job satisfaction. Personnel Psychology, 1955, 8, 27-37.

Kaczka, E., & Kirk, R. Managerial climate, work groups, and organizational performance. Administrative Science Quarterly, 1967, 12, 252-271.

Kahn, R. L., & Morse, N. N. The relationship of productivity to morale. Journal of Social Issues, 1951, 7, 8-17.

Kaplan, K. J. On the ambivalence-indifference problem in attitude theory and management: A suggested modification of the semantic differential technique. Psychological Bulletin, 1972, 77(5), 361-372.

Karasick, B., & Pritchard, R. The effects of organizational climates on managerial job performance and job satisfaction. Organizational Behavior and Human Performance, 1973, 9, 110-119.

Kast, F., & Rosenzweig, J. Organization and management: A systems approach. New York: McGraw-Hill, 1970.

Kendall & Smith. The translation of expectations: An approach to the construction of unambiguous anchors for rating scales. Journal of Applied Psychology, 1963, 47, 149-155.

Kenny, D. A. Cross-lagged panel correlation: A test for spuriousness. Psychological Bulletin, 1975, 32, 887-903.

Kerr, W. A. On the validity and reliability of the job satisfaction team ballot. *Journal of Applied Psychology*, 1948, *32*, 275-281.

Kleinman, S. D. *Personnel factors associated with Naval aviation accidents.* Center for Naval Analyses, Arlington, VA, 1976.

Klemp, G. O., Jr. *The McBer organizational climate survey questionnaire.* Boston: McBer & Company, 1975.

Klemp, G. O., Jr., Munger, M. T., & Spencer, L. M., Jr. *Analysis of leadership and management competencies of commissioned and noncommissioned naval officers in the Pacific and Atlantic fleets.* Boston: McBer & Co., August 12, 1977.

Kolb, D. A., & Boyatzis, R. E. Goal-setting and self-directed behavior change. *Human Relations*, 1970, *23*(5), 439-457.

Koontz, H., & O'Donnell, C. *Essentials of management.* New York: McGraw-Hill, 1974.

Kunin, T. The construction of a new type of attitude measure. *Personnel Psychology*, 1955, *8*, 65-77.

Lafollette, W., & Sims, H. P., Jr. An assessment of the Litwin & Stringer Organization Climate Questionnaire. *Personnel Psychology*, 1975, *28*, 19-38.

Lafollette, W. R., & Sims, H. P. Is satisfaction redundant with organizational climate? *Organizational Behavior and Human Performance*, 1975, *13*, 257-278.

Lake, D. G., Miles, M. B., & Earle, R. B. *Measuring human behavior.* New York: Teachers College, Columbia University, 1973.

Laocco, J. M., Gunderson, E. K., Dean, L. M., James, L. R., Jones, A. P., & Sells, S. B. *Organizational and environmental factors in health and personnel effectiveness: II. Data collection methods, test instruments, and criterion variables.* (Report No. 75-9.) San Diego, CA: Naval Health Research Center, December 1974.

Lawler, E. E., III. *Motivation in work organizations.* Monterey, CA: Brooks/Cole Publishing Company, 1973.

Lawrence, P. R., & Lorsch, J. W. *Studies in organization design.* Homewood, IL: Richard D. Irwin, Inc., & The Dorsey Press, 1970.

Levinson, H., Molinari, J., & Spohn, A. G. *Organizational diagnosis.* Cambridge: Harvard University Press, 1972.

Lewin, A. Y., & Zwany, A. *Peer nominations: A model, literature critique, and a paradigm for research.* Springfield, VA: National Technical Information Service, 1976.

.Licherman, M., Yalom, I., & Miles, M. Encounter groups: First facts.
    New York: Basic Books, 1973.

Light, R. J., & Smith, P. V. Accumulating evidence: Procedures for re-
    solving contradictions among different research studies. Harvard
    Educational Review, 1971, 41, 429-471.

Likert, J. G., & Likert, R. New ways of managing conflict. New York:
    McGraw-Hill, Inc., 1976.

Likert, R. Human resource accounting: Building and assessing productive
    organizations. Personnel, May/June 1973.

Likert, R. L. The human organization. New York: McGraw-Hill, 1967.

Likert, R. L. New patterns of management. New York: McGraw-Hill, 1961.

Likert, R. L., & Bowers, D. G. Organizational theory and human resource
    accounting. American Psychologist, 1969, 24(6), 585-592.

Likert, R. L., Bowers, D. G., & Norman, R. How to increase a firm's lead
    time in recognizing and dealing with problems of managing its human
    organization. Michigan Business Review, 1969, 21(1), 12-17.

Litwin, G. H., & Stringer, R. A., Jr. Motivation and organizational cli-
    mate. Cambridge: Harvard University Graduate School of Business
    Administration, Division of Research, 1968.

Locke, E. A. What is job satisfaction? Organizational Behavior and Human
    Performance, 1969, 4, 309-336.

Mahler, W. R. Diagnostic studies. Reading, MA: Addison-Wesley Publishing
    Co., 1974.

Mann, R. D., Gibbard, G. A., & Hartman, J. J. Interpersonal styles and
    group development. New York: John Wiley and Sons, Inc., 1967.

Mansfield, R., & Payne, R. L. Relationships of perceptions of organizational
    climate to organizational structure context and hierarchial position.
    Administrative Science Quarterly, 1973, 18, 515-526.

Maslow, A. H. A theory of human motivation. Psychology Review, 1943, 50,
    370-396.

McClelland, D. C. A guide to job competency assessment. Boston: McBer &
    Co., 1976.

Meyer, H. H. Achievement motivation and organizational climates. In R.
    Tagiuri & G. H. Litwin (Eds.), Organizational climate. Cambridge:
    Harvard University Press.

Michigan organizational assessment package: Progress Report II. University
    of Michigan, Institute for Social Research, August 1975.

137

Nikols, Major W. Army Organizational Effectiveness Staff Officers (OESO). Fort Ord, CA: Private communication, June 17, 1977.

Miller, G. A. The magical number seven plus or minus two: Some limitations on our capacity for processing information. Psychological Review, 1956, 65, 81-97.

Moos, R. H. Evaluating treatment environments: A social ecological approach. New York: John Wiley & Sons, 1974.

Moos, R. Military company environment inventory manual. Palo Alto, CA: Stanford University, Department of Psychiatry, Social Ecology Laboratory, 1974.

Moos & Horts. Assessment of the social atmospheres of psychiatric wards. Abnormal Psychology, 1968, 20, 442-449.

Motowidlo, S. J., Dowell, B. E., Hopp, M. A., Borman, W. C., Johnson, P. D., & Dunnette, M. D. Motivation, satisfaction, and morale in Army careers: A review of theory and measurement. (ARI Tech. Report TR-76-A7.) Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, December 1976.

Mott, P. The characteristics of effective organizations. New York: Harper & Row, 1972.

Mowday, R. T., & Steers, R. M. The motivational properties of tasks. Arlington, VA: Organizational Effectiveness Research Programs, Office of Naval Research, 1976.

Muchinsky, P. M. An assessment of the Litwin & Stringer Organization Climate Questionnaire: An empirical and theoretical extension of the Sims & Lafollette study. Personnel Psychology, 1976, 29, 371-392.

Mumford, S. J. Human resource management and operational readiness as measured by refresher training on Navy ships. San Diego, CA: Navy Personnel Research and Development Center, February 1976.

Munger, M., Spencer, L., & Thomson, T. The U.S. Navy human resource management (shore) cycle: A manual for consultants. Boston: McBer & Co., 1976.

Nealey, S. M., Thornton, G. C., & Wood, M. T. Characteristics of critical leadership. Incidents in the Navy. Arlington, VA: Organizational Effectiveness Research Program, Office of Naval Research, November 1975.

Nealey, S. M., Thornton, G. C., & Wood, M. T. Effects of leadership power applied to different kinds of organizational problems: A critical incident approach. Arlington, VA: Organizational Effectiveness Research Program, Office of Naval Research, November 1975.

Newell, A., & Simon, H. A. Human problem solving. Englewood Cliffs, NJ: Prentice-Hall, 1972.

Nunnally, J. C. Psychometric theory. New York: McGraw-Hill, Inc., 1967.

Occupational attitude inventory. Lackland Air Force Base, TX: USAF Human Resources Laboratory, May 1975.

OE survey data processing system (survey) users manual (interim version). Fort Ord, CA: U.S. Army Administration Center, Organizational Effectiveness Training Center, 1976.

Organizational survey feedback manual. Arlington, VA: Army Research Institute, 1976.

Osgood, C. E. Studies on the generation of affective meaning systems. American Psychologist, 1962, 17, 10-28.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. The measurement of meaning. Urbana, IL: University of Illinois Press, 1957.

Pallone, N. J., Rickard, F. S., & Hurley, R. B. Job satisfaction research of 1966-1967. Personnel and Guidance Journal, 1970, 48(6), 469-478.

Patchen, M. Some questionnaire measures of employee motivation and morale. Ann Arbor: Survey Research Center, Institute for Social Research, University of Michigan, 1965.

Patchen, M., Allen, C. W., & Pelz, D. C. Some questionnaire measures of employee motivation and morale. Ann Arbor: University of Michigan, Institute for Social Research, 1975.

Payne, R. L., & Pheysey, D. G. G. Stern's organizational climate index: A reconceptualization and application to business organizations. Organizational Behavior and Human Performance, 1971, 6, 77-98.

Peabody, D. Models for estimating content and set components in attitude and personality scales. Educational and Psychological Measurement, 1964, 24(2).

Pecorella, P. A., Hausser, D. L., & Wissler, A. L. Survey-guided development: A manual for consultants. Ann Arbor: University of Michigan, Institute for Social Research, June 1974.

Pelz, D., & Andrews, F. Scientists in organizations. Productive climates for research and development. Ann Arbor: University of Michigan, Institute for Social Research, 1976.

Perkins, D. Personal communication. Ann Arbor: University of Michigan, Institute for Social Research, May 31, 1977.

Pfeiffer, J. W., & Heslin, R. Instrumentation in human relations training. LaJolla, CA: University Associates, 1973.

Porter, E. H. Strength deployment inventory. Pacific Palisades, CA: Personal Strengths Assessment Service, 1973.

Porter, L. W. A study of perceived need satisfactions in bottom and mid-
     dle management jobs. Journal of Applied Psychology, 1961, 45, 1-10.

Pritchard, R., & Karasick, B. The effects of organizational climate on
     managerial job performance and job satisfaction. Organizational Be-
     havior and Human Performance, 1973, 9, 110-119.

Reddin, W. J. Management effectiveness. New York: McGraw-Hill Book Co.,
     1970.

Roach, D. E. Dimensions of employee morale. Personnel Psychology, 1958,
     11, 419-431.

Robinson, J. P., & Shaver, P. R. Measures of social psychological atti-
     tudes (Rev. Ed.). Ann Arbor: University of Michigan, Institute for
     Social Research, Survey Research Center, 1976.

Rosenberg, M. The logic of survey analysis. New York: Basic Books, Inc.,
     1968.

Ross, W. L. Implementation and evaluation of an OD intervention program.
     Paper presented at the meeting of the American Psychological Associa-
     tion, Chicago, September 1975.

Sachar, J. An evaluation of the factor structure of the HRM Survey forms
     9 and 11. San Diego, CA: Navy Personnel Research Development Center,
     July 1976.

Sayre, Captain R. Army Organizational Effectiveness Staff Officer (OESO).
     Fort Carson, CO: Personal communication, July 11-17, 1977.

Schneider, B. Organizational climates: An essay. Personnel Psychology,
     1975, 28, 447-479.

Schutz, W. C. FIRO: A three-dimensional theory of interpersonal behavior.
     New York: Holt, Rinehart and Winston, 1958.

Schutz, W. C. Manual: The FIRO scales. Palo Alto: Consulting Psycholo-
     gists Press, 1967.

Schwab, D. P., & Cummings, L. L. Employee performance and satisfaction
     with work roles: A review and interpretation of theory. Industrial
     Relations, 1970, 9, 408-430.

Shiflett, S. C. Expansion and cross-validation of diagnostic measures and
     expectancy theory research. Paper presented at the meeting of the
     American Psychological Association, Chicago, September 1975.

Sieber, S. D. The integration of field work and survey methods. American
     Journal of Sociology, 1973, 78(6).

Sims, H. P., Jr., & Lafollette, W. An assessment of the Litwin & Stringer
     Organization Climate Questionnaire. Personnel Psychology, 1975, 28,
     19-38.

Smith, P. C., & Kendall, L. M. Retranslation of expectations: An approach to the construction of unambiguous anchors for rating scales. _Journal of Applied Psychology_, 1963, _47_(2), 149-155.

Smith, P. C., Kendall, L. M., & Hulin, C. L. _Measurement of satisfaction in work and retirement_. New York: Rand-McNally, 1969.

Smith, R. D., & Greenlaw, P. S. Simulation of a psychological decision process in personnel selection. _Management Science_, 1967, _18_, B-409-419.

Spencer, L. M. _The McBer organizational inventory--technical note_. Boston: McBer & Company, 1975.

Stacy, W. J. _Felt utilization and training in two civil engineering career ladders_. (AFHRL-TR-73-32.) Lackland Air Force Base, TX: Personnel Research Division, Air Force Human Resources Laboratory, November 1973. (Requests for this document must be referred to the OPR: HQ/USAF/PRE.)

Staw, B. M. Attribution of the "causes" of performance: A general alternative interpretation of cross-sectional research on organizations. _Organizational Behavior and Human Performance_, 1975, _13_, 414-432.

Steele, F., & Jenks, S. _The feel of the work place_. Reading, MA: Addison-Wesley Publishing Company, 1977.

Stern, G. _People in context: Measuring personality, environment, congruence in education and industry_. New York: John Wiley & Sons, 1970.

Stock, D., & Thelen, H. A. _Emotional dynamics and group culture_. New York: New York University Press, 1958.

Stogdill, R. M. _Handbook of Leadership_. New York: The Free Press, Macmillan, 1974.

Sudman, S., & Bradburn, N. M. _Response effects in surveys_. Chicago: Aldine Publishing Company, 1974.

Survey guided development. A systematic guidebook for administration, reduction, and analysis of the human resource management survey. Washington, D.C.: Naval Bureau of Personnel, 1976.

Tagiuri, R., & Litwin, G. H. (Eds.). _Organizational climate: Explorations of a concept_. Boston: Harvard University Press, 1968.

Tannenbaum, A. S. (Ed.). _Control in organizations_. New York: McGraw-Hill, 1968.

Taylor, J. C., & Bowers, D. G. _Survey of organizations_. Ann Arbor: University of Michigan Press, 1972.

Thomas, K. W., & Kilmann, R. The social desirability variable in organizational research: An alternative explanation of reported findings. <u>Academy of Management Journal,</u> <u>18</u>(4), 741-752.

Thurston, L. L., & Chave, E. J. <u>The measurement of attitudes.</u> Chicago: University of Chicago Press, 1929.

Turner, A. N., & Lawrence, P. R. <u>Individual jobs and the worker.</u> Cambridge: Harvard University Graduate School of Business Administration, 1965.

Turney, J. R. <u>Utilization of behavioral measures of effort in an OD program.</u> Paper presented at the meeting of the American Psychological Association, Chicago, September 1975.

Turney, J. R., & Cohen, S. L. (Work unit leader). <u>The development of a work environment questionnaire for the identification of organizational problem areas in specific Army work settings.</u> Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, June 1976.

Tuttle, T. C., Gould, R. B., & Hazel, J. T. <u>Dimensions of job satisfaction: Initial development of the Air Force occupational attitude inventory.</u> (AFHRL-TR-75-1, AD-A014 796.) Lackland Air Force Base, TX: Occupational and Manpower Research Division, Air Force Human Resources Laboratory, June 1975.

Tuttle, T. C., & Hazel, J. T. <u>Review and implications of job satisfaction and work motivation theories for Air Force research.</u> (AFHRL-TR-73-56, AD-782 443.) Lackland Air Force Base, TX: Occupational Research Division, Air Force Human Resources Laboratory, January 1974.

<u>USAREUR organizational survey.</u> Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, undated.

VanMaanen, J., & Katz, R. <u>Work satisfaction in the public sector.</u> Technical Report. Washington, D.C.: National Training and Development Service, 1974.

Vroom, V. H. <u>A multi-dimensional measure of leader behavior.</u> New Haven, CT: Yale University, Department of Administrative Sciences, Organizational Effectiveness Research Programs, Office of Naval Research, May 1973.

Vroom, V. H. <u>Work and motivation.</u> New York: John Wiley & Sons, 1964.

Vroom, V. H., & Yetton, P. W. <u>Leadership and decisionmaking.</u> Pittsburgh: University of Pittsburgh Press, 1973.

Wanous, J. P., & Lawler, E. E. Measurement and meaning of job satisfaction. <u>Journal of Applied Psychology,</u> 1972, <u>56</u>(2), 95-105.

142

Watson, T. W., & Zumbro, P. A. An evaluation of job enrichment with im-
plications for Air Force job redesign. Lackland Air Force Base, TX:
Occupational and Manpower Research Division, Air Force Human Re-
sources Laboratory, Report in preparation, 1977.

Weiss, D. J., Dawis, R. V., & England, G. W. Instrumentation for the
theory of work adjustment. Minnesota Studies in Vocational Rehabili-
tation, 22, 1966.

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. Manual for
the Minnesota satisfaction questionnaire. Minnesota Studies in Vo-
cational Rehabilitation, 22, 1967.

Whitsett, D. A., & Winslow, E. N. An analysis of studies critical of the
motivator-hygiene theory. Personnel Psychology, 1967, 20(4), 391-416.

Wilcore, G. The Navy human resource management survey. A factor analysis
of each component dimension. NPRDC Report in Press.

Wissler, Captain J. G. U.S. Pacific fleet retention analysis. Paper given
at the fiscal year 1976 Retention Conference, Pearl Harbor, 1976.

Work analysis questionnaire. Boston: McBer & Co., 1976.

Work environment questionnaire--Floor analyst. Augsberg, F. S. Arlington,
VA: U.S. Army Research Institute for the Behavioral & Social Sciences.

Work environment questionnaire--Mode controller. Augsberg, F. S. Arling-
ton, VA: U.S. Army Research Institute for the Behavioral & Social
Sciences.

Work environment questionnaire--Seneca Army Depot. Washington, D.C.:
Department of the Army (Despers), Army Research Institute.

Work environment questionnaire--32AADCOM. Arlington, VA: U.S. Army Re-
search Institute for the Behavioral and Social Sciences, 1975.

111683