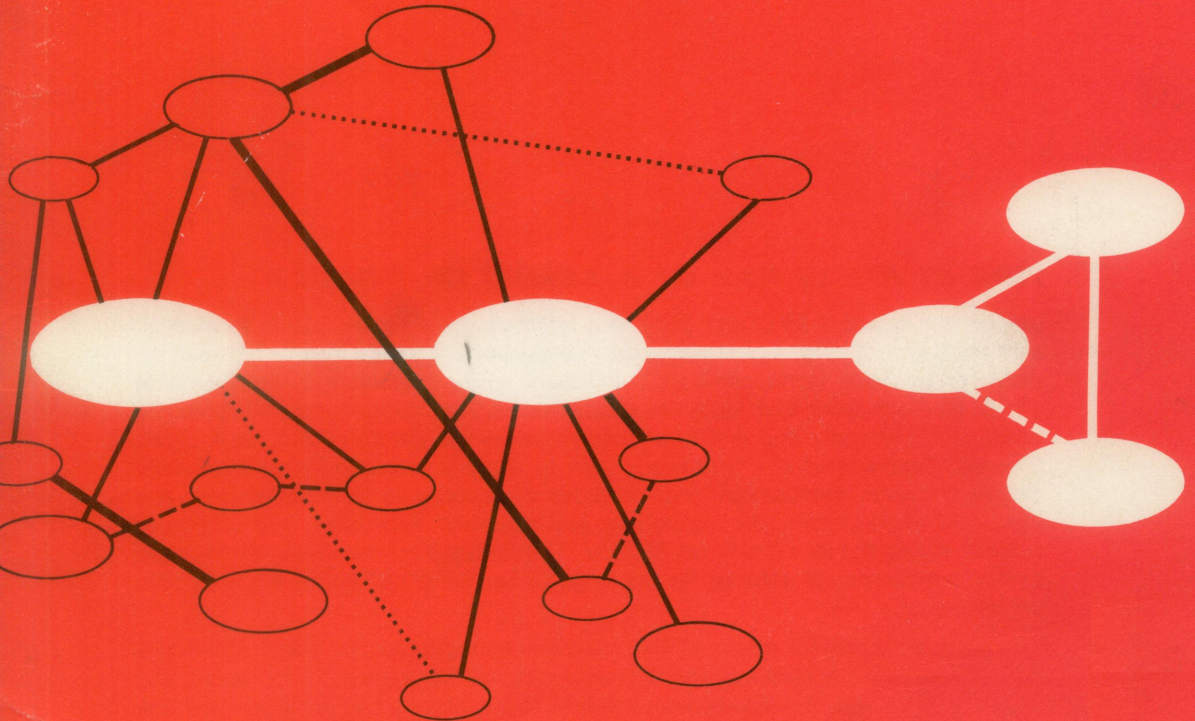


Productivity  
(1963-1964 folder)

# THE PRODUCTIVITY OF WORK GROUPS



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by2 FLOYD C. MANN,  
BERNARD P. INDIK and  
VICTOR H. VROOM.

Ann Arbor SURVEY RESEARCH CENTER  
INSTITUTE FOR SOCIAL RESEARCH,  
THE UNIVERSITY OF MICHIGAN

1963

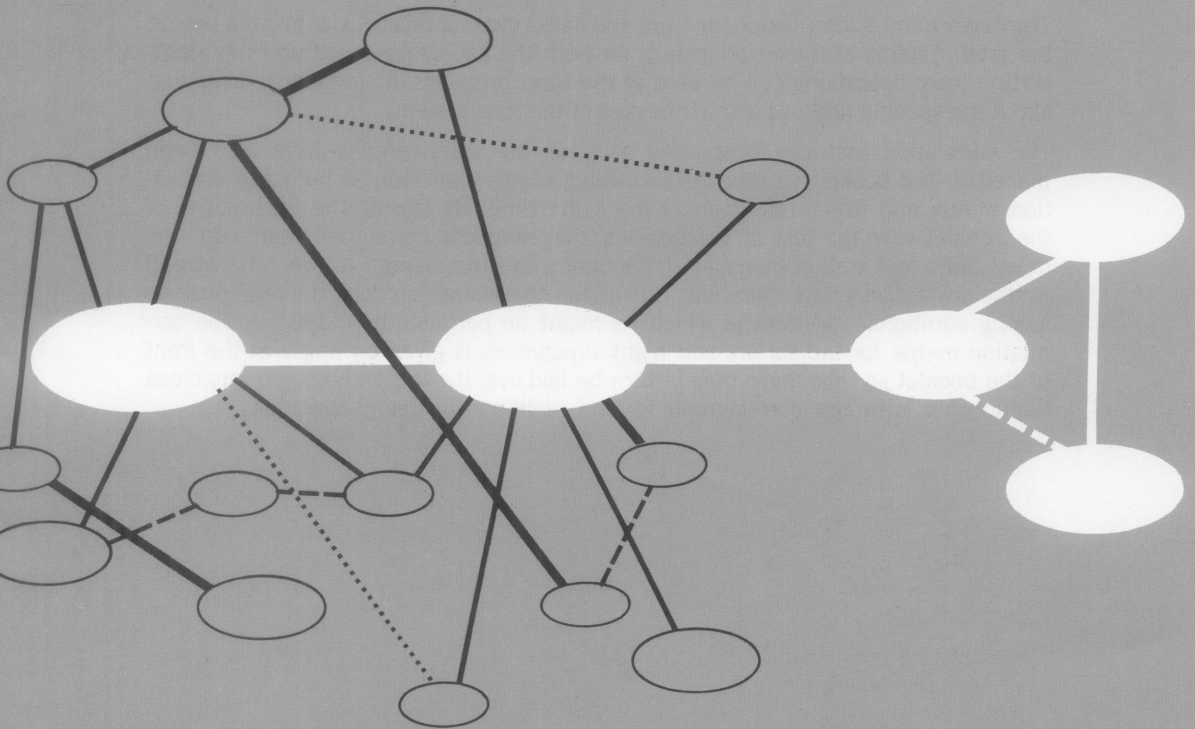
### ***THIS STUDY IS ONE OF A SERIES OF STUDIES . . .***

carried out between 1955 and 1957 in a large company having plants located all over the United States. A company wide investigation of the relationship between supervisory behavior, worker attitudes, and work group effectiveness was begun in 1955. Findings from that study were reported to the management, intermediate levels of supervision, and first level supervisors in the plants of two large cities. This was done as part of a field experiment to study a process of data utilization. Before and after measurements of attitudes were obtained from supervisors and men, and measurements of productivity and absences were taken from company records during the spring and fall of 1957. The findings reported here are from the before measurements obtained in the larger of two cities just before the data utilization period.

The field experimental phase of this research was directed by Floyd Mann and Robert Kahn. The analyses of the data were done by Floyd Mann, Victor Vroom, and Bernard Indik, with the assistance of Sandra Gratz. Rensis Likert helped with the final editing and contributed a number of ideas which made their way into the project. Stanley Seashore added to the readability of the booklet.

The president, general manager, and other members of the top organizational team made this series of studies possible through their personal and corporate support. They were keenly interested in the project, giving it their time, ideas, and suggestions. Their names, like the officers of the teamsters who represented the non-supervisory men in the study, must remain anonymous. We are indebted to both of these groups and especially the men, supervisors, and managers who gave us their opinions and attitudes by filling out brief questionnaires.

# **THE PRODUCTIVITY OF WORK GROUPS**



FLOYD C. MANN  
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## ***ABOUT THE DESIGN OF THIS BOOKLET***

This booklet is organized and assembled so that the reader may become familiar with the interrelationships within particular classes of factors—such as worker satisfaction with different elements of the job situation — and at the same time see how different classes of factors are related to one another.

The pages immediately inside the front and back covers of this booklet fold out so that the total systems of interrelationships for both the day-delivery unit and the night-sorting team operations can be seen at the same time that the individual is reading about the specific findings within one area of the total system.

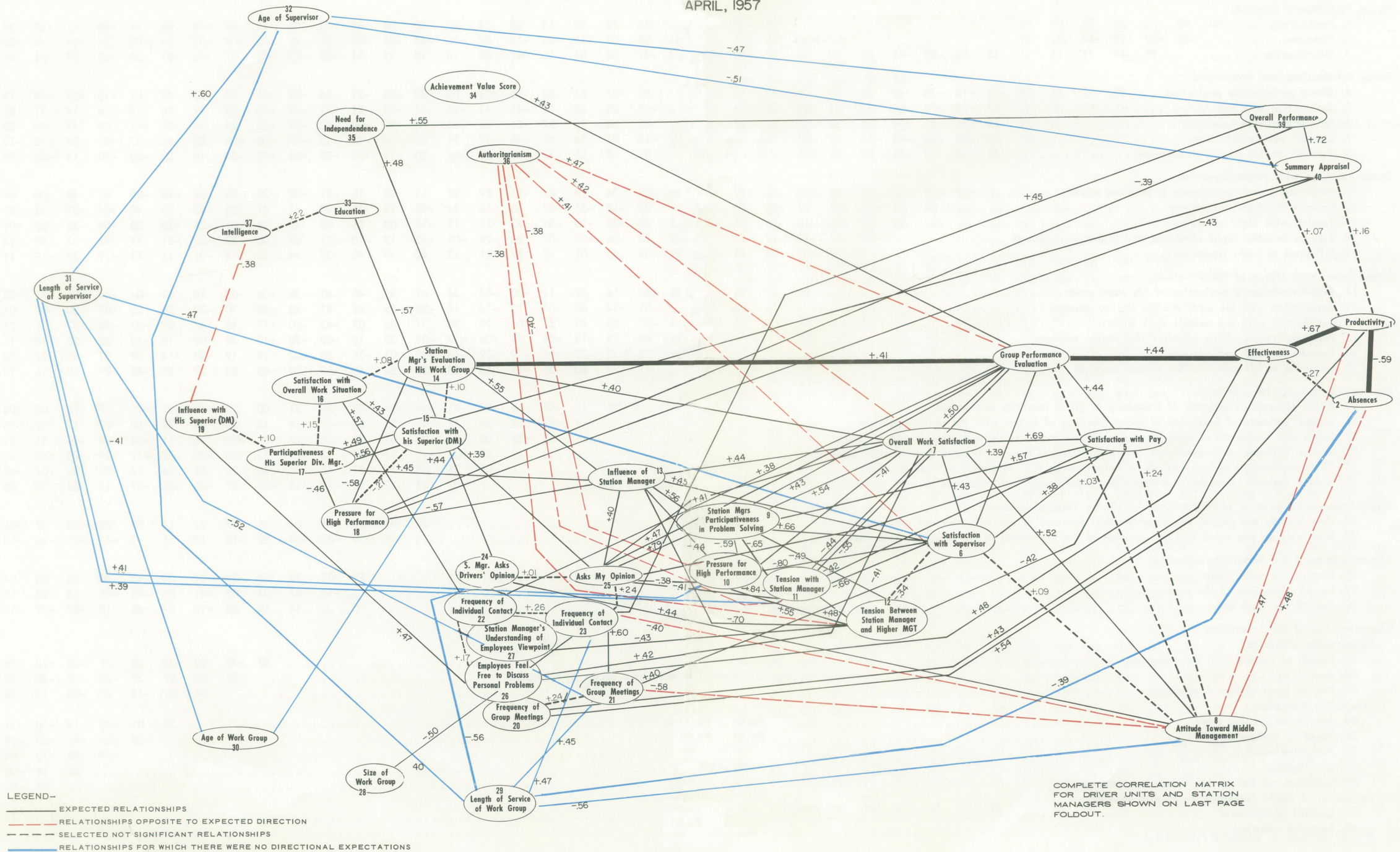
The correlation matrices supporting each of the correlographs have also been placed in the booklet so that the individual reader can look at both the correlation matrix and its correlograph at the same time. By folding the back pages of the booklet over the text of the booklet, the complete correlation matrix for the driver units and station managers is brought into juxtaposition to the correlograph for the day-delivery unit operation. This allows the reader to check the relationships among additional variables in which he might be particularly interested. The correlation matrix for the sorters and night supervisors is given on pages at the front of the booklet so that these may in turn be laid over the text and brought into close relationship with the correlograph for the night-sorting team operation.



## CORRELATION MATRIX FOR SORTERS AND NIGHT SUPERVISORS

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Group Performance Measures																																							
1. Productivity . . . . .	-53	92	32	27	23	02	08	16	-13	-05	-28	61	69	23	42	-08	-51	32	-56	14	32	16	26	04	40	60	36	48	-23	04	15	02	-03	08	24	-39	11	-12	27
2. Absences . . . . .	-56	-20	-29	-41	-32	-17	-12	27	26	33	-21	-73	-24	-46	-12	14	-41	53	05	-18	-03	-13	07	-36	-46	-21	-30	21	22	00	-08	-02	-24	-05	14	-04	12	-02	
3. Effectiveness . . . . .	39	47	35	18	11	15	-23	-09	-41	53	59	26	29	-00	-33	24	-47	02	31	16	-01	03	18	38	21	31	-25	-12	-02	07	-06	-01	22	-25	07	-21	31		
Sorter Satisfaction and Evaluations																																							
4. Group performance evaluation . . . . .	51	19	25	34	-02	-18	-16	-42	20	40	08	25	19	-18	34	05	-07	36	-28	-26	-04	03	33	-08	-22	-24	-09	-01	00	33	40	01	-10	-02	-18	19			
5. Satisfaction with pay . . . . .	69	60	47	49	-52	-54	-68	24	31	-09	25	-02	-24	13	-10	08	26	29	-41	41	-13	24	-20	-21	-21	-42	-40	-03	11	26	-19	-06	14	-31	01				
6. Satisfaction with supervisor . . . . .	37	29	72	-81	-83	-44	35	35	-15	59	13	-36	32	-33	30	13	57	-21	65	-02	13	-03	-00	-40	-37	-33	04	14	-07	-41	09	47	09	22					
7. Overall work satisfaction . . . . .	49	31	-24	-08	-43	-12	22	-31	06	-16	-22	23	-14	01	14	01	-43	27	21	25	-36	-12	-38	-34	-36	-00	08	12	-37	-04	-00	-23	-12						
8. Attitude toward middle management . . . . .	28	-32	-33	-31	09	31	-15	14	-29	-46	36	01	10	53	-12	-47	27	05	20	-14	-04	-35	-06	-03	-34	16	22	-23	-20	16	-26	-28							
Sorter Relations with Night Supervisor																																							
9. Night sup's participativeness in problem solving . . . . .	-68	-69	-44	21	13	-25	42	-10	-49	25	-23	36	14	47	-11	89	02	13	-25	15	-31	-32	-25	20	07	-10	-58	07	42	-00	04								
10. Pressure for high performance . . . . .	84	28	-18	-36	21	-55	14	24	-24	22	-18	-31	-37	38	-58	24	-08	18	-05	47	41	41	02	-03	05	40	-04	-21	-13	-29									
11. Tension with night supervisor . . . . .	38	-17	-32	13	-60	01	31	-23	22	-30	-20	-35	27	-52	12	-18	08	06	32	40	26	-01	-25	-10	33	-04	-35	-05	-01										
12. Tension between night supervisor and higher management . . . . .	-28	-27	-13	-17	-11	33	-32	18	-06	-29	-07	20	-29	-01	-20	12	-13	-01	37	30	-22	-27	-21	19	21	-33	40	14											
13. Influence of night supervisor . . . . .	37	-07	26	25	-43	34	-32	46	01	22	37	21	-12	42	49	40	-07	14	24	-14	-01	16	12	-19	39	-19	11												
Night Supervisor's Views of His Situation																																							
14. Night supervisor's evaluation of his work group . . . . .	08	71	06	-35	66	-42	16	57	11	-00	-02	36	69	31	40	-40	-28	-06	-03	18	41	-04	-44	05	11	23													
15. Satisfaction with his superior: The station manager . . . . .	-16	08	32	-15	01	-34	00	-04	10	-16	19	-09	32	25	41	20	20	10	-27	20	23	-09	20	-08	01														
16. Satisfaction with the overall work situation . . . . .	14	-44	54	-37	20	43	27	06	29	30	37	06	09	-42	-30	-19	15	47	09	-31	-02	37	31	26															
17. Participativeness of his superior: The station manager . . . . .	21	46	07	24	-13	-04	05	-06	-17	-03	33	15	-00	-30	-10	28	05	18	-12	32	30	18	16																
18. Pressure for high performance . . . . .	-49	53	-18	-37	-01	-12	-29	-43	-38	01	-25	50	-03	-10	19	-38	-14	22	31	-30	22	03																	
19. Influence of his superior: The station manager . . . . .	-11	27	60	-05	-15	15	23	37	24	48	-57	-20	-05	03	27	25	-46	-29	29	16	19																		
Perceptions of Supervisory Behavior																																							
20. Night supervisor's estimate of frequency of group meetings with sorters . . . . .	-08	13	-07	-18	-07	-41	-46	-14	-38	29	21	00	20	-13	-17	-25	07	-16	05	-04																			
21. Sorters' estimate of frequency of group meetings of sorters with the night supervisor . . . . .	-11	32	07	34	11	49	33	34	-12	-16	12	26	02	22	-03	-22	15	09	-05																				
22. Night sup.'s estimate of frequency of individual contacts between himself and his sorters . . . . .	02	-35	03	06	07	02	21	-38	-22	-31	-02	16	11	-33	-48	-01	11	31																					
23. Sorters' estimate of frequency of individual contacts between himself and his night supervisor . . . . .	18	57	02	-13	07	09	13	-23	-34	20	-20	-22	-19	-09	23	49	45																						
24. Night supervisor's estimate of his participativeness with reference to work problems . . . . .	-13	35	08	32	21	46	35	36	26	-15	06	17	-03	05	-01	-01																							
25. Sorters' estimate of night supervisor's participativeness with reference to work problems . . . . .	-09	-03	-18	10	-19	-15	-23	07	-05	-26	-59	17	54	15	08																								
Night Supervisor's Estimate of Night Supervisor-Sorter Personal Relations																																							
26. How free do the people you supervise feel to come to you with personal problems . . . . .	37	-06	23	-01	04	26	37	27	14	09	-30	-05	07	-01																									
27. How well do you think that you understand the viewpoints of the men you supervise . . . . .	45	39	-33	-04	25	-18	13	51	17	-47	-01	-16	-13																										
Characteristics of the Sorter Work Groups																																							
28. Size of the work group . . . . .	59	-08	26	26	-30	-34	04	13	-40	23	03	04																											
29. Length of service of the work group . . . . .	-15	-07	04	03	-41	06	-05	-45	15	08	15																												
30. Age of the work group . . . . .	14	15	33	-13	04	45	10	-07	-02	-13																													
Characteristics of the Supervisors																																							
Demographic Variables																																							
31. Length of service with the company . . . . .	82	-42	03	-28	20	-21	-00	-28	-28																														
32. Age . . . . .	(More of a factor is compared to more of a factor in all cases)	-22	22	07	39	-23	-08	-38	-42																														
33. Present level of formal education . . . . .	04	-07	-13	20	-03	13	18																																
Personality Variables																																							
34. Achievement value score . . . . .	Number of groups = 24	22	01	-05	14	-10	-21																																
35. Need for independence . . . . .	P<.01 — r = .52	25	-35	-42	-23	-19																																	
36. Authoritarianism . . . . .		-14	-43	-13	-04																																		
37. Intelligence . . . . .	P<.05 — r = .41				31	16	-02																																
38. Opinions and beliefs about how to supervise . . . . .						09	-06																																
Evaluation of Night Supervisor by Higher Management																																							
39. Overall performance . . . . .																																							
40. Summary appraisal . . . . .																																							
																																					71		

CORRELOGRAPH FOR THE DAY-DELIVERY UNIT OPERATION  
METROPOLITAN PLANT  
APRIL, 1957



## ***WHAT WERE WE LOOKING FOR IN THIS STUDY?***

Research in the last fifteen years has demonstrated repeatedly that there are few simple, consistent relationships between leadership practices, worker perceptions, attitudes, and satisfactions, and measures of work group effectiveness. Studies in insurance companies, privately owned utilities, factories, government agencies, hospitals, unions, and voluntary associations have shown what the supervisor does, how the employees feel, and what the absence rate or productivity of a unit is varies considerably depending upon the type of organization, the organizational level of the unit under consideration, the stage of organizational growth, the size of the organization, the values and expectations of the members, and a number of other variables, the nature of which are not yet understood. The patterns of relationships among these broad groups of factors are a good deal more complex than some of the early findings from studies investigating the differences between highly effective and markedly less effective units would have led many to believe.

This particular study represents an attempt to map—to lay out—to present visually—in a meaningful fashion, this complexity for one part of one plant in one company at one point of time. It is our belief that this approach to the interlocking, systemic nature of these key factors presents a more accurate picture of how the parts of an organization might actually be functioning than do simple tabulations of one variable compared to another.

Our objective then is to show graphically how a large number of measures regarding supervisory practices and characteristics, worker perceptions and satisfactions, and work group effectiveness are interrelated at one point in time. The arrangement of the findings suggests how these groups of variables might be interlinked causally, but the reader must keep in mind that what is presented is more like a snapshot than a moving picture. Research tools and presentation techniques are primitive compared to the functional complexity of an on-going company or plant.





## ***WHAT WAS THE RESEARCH SITE LIKE?***

### ***THE COMPANY***

This study was done in the largest single metropolitan plant of a nation-wide company. The company's basic function is the delivery of small parcels and packages from department and other retail stores to private residences and from manufacturers, wholesalers, and commercial distributors to their customers over broad geographical areas.

—The organization of the delivery operation within the plant consisted of

FIVE DIVISIONS AND  
TWENTY-EIGHT GEOGRAPHICALLY SEPARATE OPERATING STATIONS

—There were five levels of supervision

PLANT MANAGER  
DELIVERY SUPERINTENDENT  
DIVISION MANAGER  
STATION MANAGER  
DAY & NIGHT SUPERVISORS

—This study is concerned most directly with the station managers, day and night supervisors, and the men working under them in each station.

### ***THE TYPE OF WORK***

There were two distinctly different types of work being done at different times of the day in these stations. The men on the day shift drove trucks and delivered packages to customers; the men on the night shift sorted out huge piles of packages into delivery routes, listed the packages by destination, and loaded them into trucks for the drivers. The job titles of the two groups were: (1) drivers, and (2) sorters.

### ***DRIVERS***

Drivers reported to work at 8:30 AM and were assigned their trucks and routes and given any special instructions for the day. By 9:00 AM all drivers had left with their day's load. Each man drove a relatively fixed route to deliver his parcels. When he returned to the station in the afternoon, he turned in the money he had collected, returned parcels, told his supervisor about any special problems, and then left for the day.



There were 30-50 drivers assigned to each station, each of whom reported directly to the station manager. One driver was assigned to a truck. Each driver was paid on an individually calculated standard hours dispatch. The nature of the work permitted interaction among drivers and between driver and station manager only for a few minutes at the beginning and end of each day.

## ***SORTERS***

Parcels and packages were first sorted in large central and divisional sorts and then delivered to stations for a final positioning by sorting teams. Sorters were responsible for taking the parcels from a continuous conveyor belt and positioning them on shelves corresponding to an appropriate truck route. There were 8-10 men in a crew. They worked on both sides of the conveyor belt to position packages for 30-50 routes. The positioning of packages took between three to four hours. After this the sorters made up a list of all the packages for each driver and then loaded the packages on the trucks in a special order so that each driver knew which package to grab next. When everyone was through loading his trucks, the sorting teams were done. The team arrived at work at 11:30 PM and left when the work was done. This might be as early as 4:00 or 5:00 AM or as late as 8:30 AM. Unlike the drivers, sorters were paid on a group incentive plan based on a standard rate for the number of pieces per hour. There was a great deal of interaction among sorters and between sorters and their night supervisor who worked along side of them throughout the entire operation.

THE MEN ON THE NIGHT SHIFT HAD TO DEPEND ON EACH OTHER—WERE HIGHLY INTERDEPENDENT—IN THE WAY IN WHICH THEY DID MUCH OF THEIR WORK; THE MEN ON THE DAY SHIFT WERE NOT.

## ***THE CIRCUMSTANCES***

The data for this study were collected in the early part of April, 1957. This was just before the beginning of the 1957-58 recession in economic activity.

Responsibility for the management of the total plant had been given to a new plant manager and delivery superintendent only six months before these measurements were taken. These men had made a number of supervisory personnel changes in one of the divisions four months earlier. All of their appointments were made in the expectation that there would be a tightening up of the organization and a reduction in operating costs.

Our measures were then made at a time when a change may have been occurring in the relationships among the variables studied. To discover what the typical relationships are among measures such as those used in this study, the ideal single time to collect data would be during a period when the organization is in "a steady state" or relative equilibrium.

## **WHAT KIND OF MEASURES WERE USED?**

A number of different kinds of measures are employed in this study. They include—

- ... company records of productivity and absences
- ... management ratings of the effectiveness of operating units
- ... management appraisals of supervisors
- ... workers' perceptions and satisfactions
- ... supervisors' perceptions and satisfactions
- ... supervisors' values and beliefs
- ... background and demographic characteristics of personnel at all levels.

Each of these measures is now described in detail —

### **GROUP PERFORMANCE MEASURES**

#### **PRODUCTIVITY (1)**

I The actual net cost for handling each parcel is computed each day and compared to a ~~standard cost per piece~~ as determined by time study. The productivity figure used here is the extent to which actual costs exceeded standard costs for the month in advance of the administration of the questionnaire—March, 1957.

#### **ABSENCES (2)**

The ratio of the number of man-days absent divided by the number of man-days worked for each station for the six month period before the administration, of the questionnaires.

#### **EFFECTIVENESS (3)**

I Independent judgments were obtained from a group of operating and staff managers (above the station manager level) concerning the relative effectiveness (i.e. the degree of attainment of organizational objectives) of the 28 stations. The raters had first-hand knowledge of the stations they rated, but were not directly involved in the operation of the stations. Judgments were obtained in the form of ratings on a five-point scale of the overall performance of the day operation and then of the night operation.

## **QUESTIONNAIRE MEASURES**

The attitudes and perceptions of drivers, sorters, and supervisors were measured by three slightly different paper-and-pencil questionnaires, having questions with fixed alternative responses. Responses of each group to a single question were subsequently averaged and combined with the responses of the same group to one or more other items to obtain group indices or measures. Group scores or indices were thus obtained for use in much of our analysis.

Questionnaire information from 1158 drivers and 288 sorters were reduced to average figures for each of the 28 delivery units and 24 sorting teams. Questionnaire information was also obtained from the 28 station managers and the 24 night supervisors responsible for these groups. (Four groups of night men did not fill out their questionnaires in the April 1957 administration because of their misgivings regarding the purposes of the study.)

## **DRIVERS' AND SORTERS' SATISFACTIONS AND EVALUATIONS**

### **GROUP PERFORMANCE EVALUATION (4)**

Comparing the people you work with and people in other stations doing the same kind of work, how does your group compare in getting the job done? (5 alternatives: among the very best to among the poorest)

To what extent do people in the different jobs in your station see eye-to-eye on things about the everyday operations of your station? (5 alternatives: complete agreement to no agreement)

### **SATISFACTION WITH PAY (5)**

How satisfied are you with your present wages? (5 alternatives: completely satisfied to not at all satisfied)

How do you feel about the standards or time schedules set up for your job? (5 alternatives: very fair to not at all fair)

### **SATISFACTION WITH SUPERVISOR (6)**

How free do you feel to discuss your personal problems with your (station manager or night supervisor)? (5 alternatives: always feel free to never feel free)

How often does your (station manager or night supervisor) express appreciation for your work? (5 alternatives: very often to never)

From your dealings with your (station manager or night supervisor) how well would you say the following comment fits him: Considerate of our feelings. (4 alternatives: fits him very well to doesn't fit him at all well)

How well do you think your (station manager or night supervisor) understands the employee's viewpoint? (5 alternatives: complete understanding to no understanding)

How good is your (station manager or night supervisor) in dealing with people? (5 alternatives: an excellent job to a poor job)

### **OVERALL WORK SATISFACTION (7)**

Taking all things into consideration, how do you feel about your future with (name of company)? (5 alternatives: very secure to not secure at all)

Taking all things into consideration, how satisfied are you with your job and the company? (5 alternatives: very well satisfied to not at all satisfied)

### **ATTITUDE TOWARD MIDDLE MANAGEMENT: THE DIVISION MANAGER (8)**

How well do you think your division manager understands the employee's viewpoint? (5 alternatives: a complete understanding to no understanding)

How good is your division manager in dealing with people? (5 alternatives: an excellent job to a poor job)

## ***DRIVERS' AND SORTERS' RELATIONS WITH SUPERVISION***

### **PERCEPTION OF SUPERVISOR'S PARTICIPATIVENESS IN PROBLEM SOLVING (9)**

Does your (station manager or night supervisor) ask your opinion when a problem comes up that involves your work? (5 alternatives: always to never)

If you have a suggestion for improving the job in some way, how easy is it for you to get your ideas across to your (station manager or night supervisor) regarding things about which you are concerned? (5 alternatives: to a very great extent to not at all)

### **PERCEPTION OF PRESSURE FOR HIGH PERFORMANCE (10)**

On the job, do you feel any pressure for better performance over and above what you think is reasonable? (5 alternatives: a great deal of pressure to very little pressure)

From your dealings with your (station manager or night supervisor) how well would you say the following comments fit him?

- a) Reasonable in what he expects. (4 alternatives: fits him very well to doesn't fit him at all well)
- b) Too strict. (4 alternatives: fits him very well to doesn't fit him at all well)



✓ **PERCEPTION OF TENSION WITH SUPERVISOR (11)**

On the whole, would you say that in your station there is any tension or conflict between employees and the (station manager or night supervisor)? (5 alternatives: a great deal of tension to no tension at all)

**PERCEPTION OF TENSION BETWEEN SUPERVISOR AND HIGHER MANAGEMENT (12)**

On the whole, would you say that in your station there is any conflict between the (station manager or night supervisor) and his own supervisor? (5 alternatives: a great deal of tension to no tension at all)

**PERCEPTION OF INFLUENCE OF SUPERVISOR (13)**

From your dealings with your (station manager or night supervisor) how well would you say the following comment fits him? Lets his boss decide things. (4 alternatives: fits him very well to doesn't fit him at all well)

How much influence do you feel your (station manager or night supervisor) has on what goes on in your station? (5 alternatives: a very great deal of influence to little or no influence)

***SUPERVISOR'S VIEWS OF HIS SITUATION***

**SUPERVISOR'S EVALUATION OF HIS WORK GROUP (14)**

How do the people you personally supervise compare with other groups that do the same kind of work in getting the job done? (5 alternatives: among the very best groups to among the poorest groups)

How do the people you personally supervise compare with other groups in (name of the company) that do the same kind of work when it comes to sticking together and helping each other out? (5 alternatives: one of the best groups at sticking together and helping each other out to one of the poorest groups at sticking together and helping each other out)

**SATISFACTION WITH HIS SUPERIOR (15)**

How good is your immediate superior in dealing with people? (5 alternatives: he does an excellent job to he does a poor job)

How free do you feel to discuss personal problems with your immediate superior? (5 alternatives: I always feel free to I never feel free to discuss personal problems)

How often does your immediate superior express appreciation for your work? (5 alternatives: very often to never)

### **SATISFACTION WITH OVERALL WORK SITUATION (16)**

How well do you like supervisory work? (5 alternatives: I like it very much to I don't like it at all)

How much chance does your job give you to do the things you are best at? (5 alternatives: a very good chance to no chance)

### **PARTICIPATIVENESS OF SUPERIOR (17)**

Do you feel you can influence the decisions of your immediate superior regarding things about which you are concerned? (5 alternatives: I can influence him to a very great extent to I can not influence him at all)

Does your immediate superior ask your opinion when a problem comes up that involves your work? (5 alternatives: he always asks my opinion to he never asks my opinion)

If you have a suggestion for improving the job or changing the set up in some way, how easy is it for you to get your ideas across to your immediate superior? (5 alternatives: it is very easy to it is very difficult to get my ideas across)

### **PRESSURE FOR PERFORMANCE (18)**

On the job, do you feel any pressure for better performance over and above what you think is reasonable? (5 alternatives: I feel a great deal of pressure to I feel very little pressure over what is reasonable)

### **PERCEPTION OF SUPERIOR'S INFLUENCE (19)**

In general, how much say or influence do you feel each of the following groups has on what goes on in your station? Your superior (5 alternatives: a very great deal of influence to little or no influence)

Does your immediate superior have enough authority to decide on his own the things he should decide? (4 alternatives: Yes, he has more authority than he needs to no, he does not have enough authority.)

## ***PERCEPTIONS OF SUPERVISORY BEHAVIOR***

### **SUPERVISOR'S OWN ESTIMATE OF FREQUENCY OF GROUP MEETINGS OF SUBORDINATES WITH HIM (20)**

How frequently do you have group meetings with the men you supervise? (7 alternatives: never to a couple of times a week)

### **SUBORDINATE'S ESTIMATE OF FREQUENCY OF GROUP MEETINGS OF SUBORDINATES WITH THE SUPERVISOR (21)**

Except for regular inspection meetings, how frequently does your (station manager or night supervisor) hold group meetings with you and other men doing the same kind of work you do? (7 alternatives: never to once a day)

**SUPERVISOR'S OWN ESTIMATE OF FREQUENCY OF INDIVIDUAL CONTACTS BETWEEN HIMSELF AND HIS MEN (22)**

How often do you attempt to discuss the work of the people you supervise with them individually? (6 alternatives: never to a couple of times a week)

**SUBORDINATE'S ESTIMATE OF FREQUENCY OF INDIVIDUAL CONTACT OF SUBORDINATES WITH THE SUPERVISORS (23)**

How often does your (station manager or night supervisor) discuss various aspects of your work with you individually? (7 alternatives: never to a couple of times a week)

**SUPERVISOR'S OWN ESTIMATE OF HIS PARTICIPATIVENESS WITH REFERENCE TO WORK PROBLEMS (24)**

How often do you ask each of the following for their opinion when a problem comes up that involves their work? The drivers or the sorters. (5 alternatives: never ask to always ask)

**SUBORDINATE'S ESTIMATE OF SUPERVISOR'S PARTICIPATIVENESS WITH REFERENCE TO WORK PROBLEMS (25)**

Does your immediate supervisor ask your opinion when a problem comes up that involves your work? (5 alternatives: never asks my opinion to always asks my opinion)

**SUPERVISOR'S ESTIMATE OF SUPERVISOR-SUBORDINATE PERSONAL RELATIONS (26) (27)**

How free do the people you supervise feel to come to you with personal problems? (5 alternatives: never feel free to always feel free)

How well do you think that you understand the viewpoints of the men you supervise? (5 alternatives: no understanding to complete understanding)

***CHARACTERISTICS OF THE DRIVER AND SORTER WORK GROUPS***

**SIZE OF THE WORK GROUP (28)**

Number of members

**LENGTH OF SERVICE OF THE WORK GROUP (29)**

Mean length of service of the members

**AGE OF THE WORK GROUP (30)**

Mean age of the members

## ***CHARACTERISTICS OF THE SUPERVISORS (STATION MANAGERS OR NIGHT SUPERVISORS)***

### ***DEMOGRAPHIC VARIABLES***

**LENGTH OF SERVICE WITH THE COMPANY (31)**

**AGE (32)**

**LEVEL OF PRESENT FORMAL EDUCATION (33)**

### ***PERSONALITY VARIABLES***

**ACHIEVEMENT VALUE SCORE (34)**

Score on 8 items measuring the supervisor's orientation toward personal achievement and advancement

**NEED FOR INDEPENDENCE (35)**

Score on a 16 item scale

**AUTHORITARIANISM (36)**

Score on 25 items from a scale developed by a group of researchers at University of California (F-scale forms 40-45)

**INTELLIGENCE (37)**

Score on the Otis intelligence test

**OPINIONS AND BELIEFS ABOUT HOW TO SUPERVISE (38)**

Score on a 17 item scale developed for this project about how to supervise

## ***EVALUATION OF SUPERVISORS (STATION MANAGERS AND NIGHT SUPERVISORS) BY HIGHER MANAGEMENT FROM MANAGEMENT APPRAISAL RATINGS***

**OVERALL PERFORMANCE (39)**

A rating made up of 10 sets of 5 alternative forced choice items designed to be descriptive of a supervisor's behavior.

**SUMMARY APPRAISAL (40)**

A summary annual rating of a supervisor by higher management on the overall results of his work (productivity, cost, and quality), his planning, organizing, and teaching ability, his drive, judgment, knowledge of the work, and his personality.



## **WHAT KIND OF AN ANALYSIS TECHNIQUE WAS USED?**

### **CORRELATION**

✓ ✓

This report shows the relationships between the measures described on the preceding pages. The unit of analysis is, in each case, the work group, i.e., either a delivery unit or a sorting team. The statistical technique used in determining relationships was the Pearson Product Moment Correlation Coefficient. The size of the correlation represents the degree of relationship between two measures while the sign of the correlation indicates the direction of the relationship. This statistic varies between plus one and minus one. A plus sign means that a high score on the first measure is associated with a high score on the second measure while a low score is associated with a low score. A minus sign, on the other hand, means that a high score on one measure is associated with a low score on another measure, while a low score is associated with a high score. A zero correlation means that there is no association between the two measures.

### **SIGNIFICANCE**

In addition to the size and sign of the correlation, one wants to know its statistical significance. The significance of a correlation is expressed as the probability that it could have occurred due to chance. It is customary to adopt a level of significance above which correlations are termed significant and below which they are termed non-significant. In this report the level of significance used is the .05 level. This means that the probability that a significant correlation could have occurred by chance alone is less than five in one hundred.

### **THE CHARTS AND THE LINKAGE ANALYSIS**

The fold-out diagrams at the beginning and end of the booklet and the charts in the text show statistically significant correlations between variables in accordance with the following code. A solid black line represents a relationship in an expected direction. A long broken line indicates a relationship that is directionally opposite from what was expected. Short broken lines represent selected instances of nonsignificant relationships which are useful in the logic of the analysis. In the fold-out charts, but not in the text, there occur some blue solid lines; these are instances of significant relationships for which we had no expectations about the direction.

# ***WHAT DID WE FIND?***

## ***PRINCIPAL FINDINGS***

### ***FOR THE DAY OPERATION***

1. The productivity of delivery units is:
  - (a) positively related to management ratings of effectiveness.
  - (b) negatively related to absence rates.
2. Management ratings of effectiveness are positively related to group performance as evaluated by the drivers.
3. Drivers' evaluation of their group's performance is:
  - (c) positively related to their supervisor's evaluation of the performance of their unit.
  - (d) positively related to drivers' satisfaction with pay, with their immediate supervisor, and with the overall work situation.
4. Drivers' satisfaction with pay, with their immediate supervisor, and with the work situation is:
  - (a) positively related to the amount of participation the drivers feel that they have in solving the work problems of their unit.
  - (b) negatively related to the amount of pressure and tension they feel they are under, the amount of tension they feel exists between the men and their supervisor as well as between their supervisor and higher management.
5. The supervisor's evaluation of the performance of his unit is negatively related to the amount of pressure he feels from management.
6. The supervisor's perception of the amount of pressure he is under from management is negatively related to his perception of the opportunities to share in the solution of work problems with his superior.

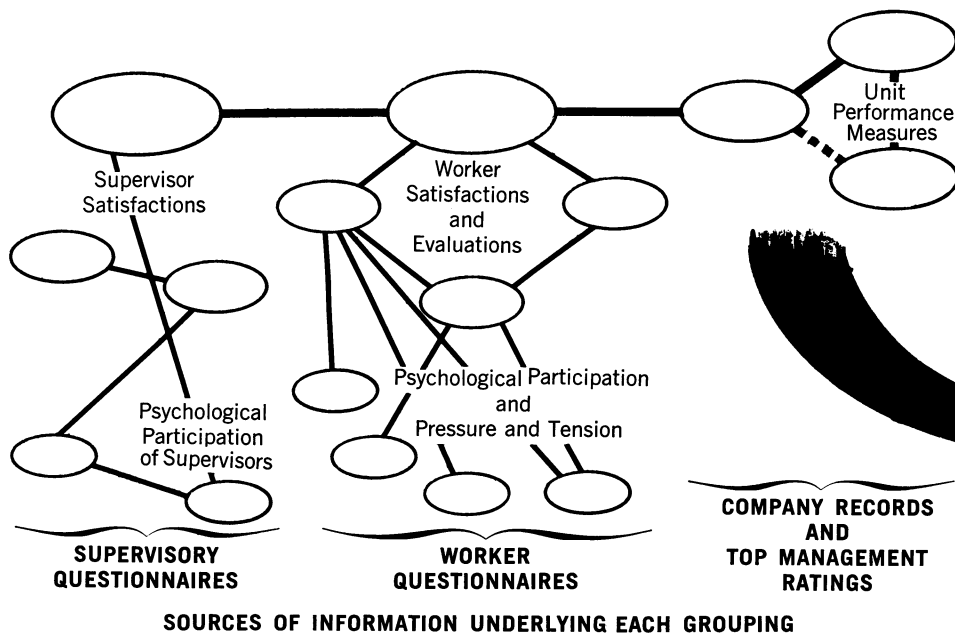
## ***FOR THE NIGHT OPERATION***

1. Management ratings of the effectiveness of sorting teams are:
  - (a) negatively related to the absence rate of the team.
  - (b) positively related to the sorter's satisfaction with their pay.
  - (c) positively related to the supervisor's evaluation of his team's performance.
2. Sorter's satisfaction with their pay is:
  - (a) positively related to their evaluation of their work group's performance, their satisfaction with their immediate supervisor and their overall situation, and the extent to which they feel middle management understands their viewpoint.
  - (b) positively related to the amount of participation the sorters feel that they have in solving work problems with their supervisor.
  - (c) negatively related to the amount of pressure they feel they are under for high performance.
  - (d) negatively related to the amount of tension they feel exists between the men and their supervisor and between their supervisor and higher management.
3. The supervisor's evaluation of the performance of his work group is:
  - (a) positively related to how much influence or authority he has to decide matters.
  - (b) positively related his own satisfaction with his overall work situation.
4. The supervisor's estimate of his influence and authority is:
  - (a) positively related to his perception of the opportunities to share in the solution of work problems with his superior.
  - (b) negatively related to the amount of pressure he feels under.
5. The amount of pressure the supervisor feels under for higher performance is negatively related to the actual productivity records of the station in which his group works.

## A SCHEMATIC OVERVIEW OF THE INTERRELATIONSHIP AMONG THE PRINCIPAL GROUPS OF FACTORS

—for the delivery units only

The chart below shows five of the principal groupings of factors which will be described in the following pages. The pattern for the 28 stations of drivers will be used as the integrative theme of this booklet: The findings from the drivers will be contrasted with those from the sorting teams.



**Note** that information from a number of different sources is to be interrelated. We are searching for the relationships between objective measures from actual records, drivers' and sorters' opinions, perceptions, and feelings, and day and night supervisors' opinions, perceptions, and feelings.

### Before going ahead

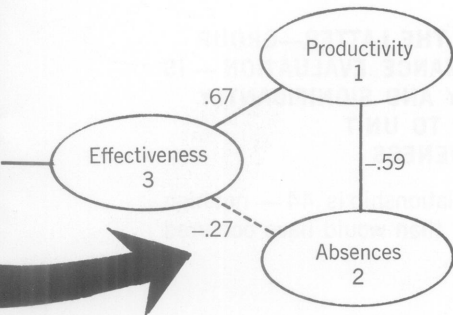
Open out the interfolded pages in the front and back of this booklet. These are pages 1C and 1D—the correlograph for the drivers' units, and pages 41A and 41B—the correlograph for the sorting teams.

## WE LOOK FIRST AT PERFORMANCE MEASURES



### **THREE MEASURES OF DELIVERY UNIT'S PERFORMANCE ARE INTERRELATED AS EXPECTED**

- ... Units rated by managers as the most effective are the most productive and have lower absence rates according to actual company records
- ... The relationship between effectiveness and productivity is positive and significant
- ... The relationship between effectiveness and frequency of absences is negative, but not significant (depicted by dotted line)



#### **WHAT THIS MEANS**

Units having lower dollar and cents costs for package delivery also have lower absence rates and are evaluated by top management as the most effective.

### **COMPARABLE FINDINGS ABOUT SORTING TEAMS**

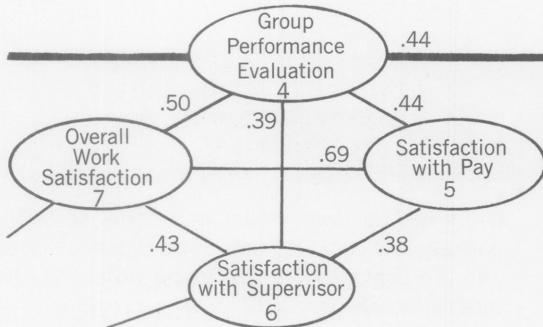
Management had no separate measure for the performance of the sorting teams in each unit. They were asked, however, to rate how well they felt each group of sorters did their jobs of sorting and listing of packages and the loading of the trucks each night. Their evaluations related significantly and negatively with frequency of absences ( $-.56$ ) — as would be suggested from the driver delivery unit findings. It would appear that management's ratings were largely based on the objective measures of station productivity since their evaluations had a very high positive relation ( $.92$ ) with actual productivity scores.

**NOW HOW ARE  
THESE PERFORMANCE  
MEASURES RELATED TO  
WORKER SATISFACTION?**

**THE SATISFACTIONS AND EVALUATIONS OF DRIVERS  
IN DELIVERY UNITS WITH DIFFERENT ASPECTS OF  
THEIR WORK SITUATIONS ARE INTERRELATED**

... Delivery units in which the men have high overall work satisfaction are also more likely to be units having —

- high satisfaction with the immediate supervisor
- high satisfaction with pay and job standards
- high evaluation of the work done by the group



**... AND THE LATTER—GROUP  
PERFORMANCE EVALUATION — IS  
DIRECTLY AND SIGNIFICANTLY  
RELATED TO UNIT  
EFFECTIVENESS**

... The relationship is .44 — not high but larger than would have occurred by chance.

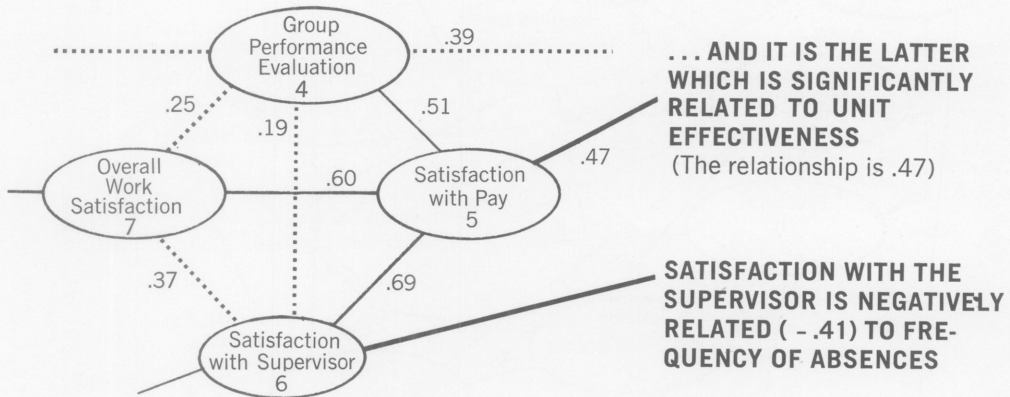
**WHAT THIS MEANS**

How good a group the drivers feel the men of their delivery unit is in getting the job done is the only factor in this group directly related to unit performance. This evaluation by the drivers of their group's performance may be interpreted as simply a subjective measure of the objective performance measures of the unit or as evidence that high pride in one's group results in good group performance. This correlational analysis can not identify which interpretation is correct, but since the men do not have access to these figures, there is some support for the second explanation.

One thing is clear here. There were not direct relationships between satisfactions with pay, the immediate supervisor, or the overall job situation with our measures of effectiveness for the drivers on this date.

## **WORK SITUATION SATISFACTIONS AND EVALUATIONS OF SORTING TEAMS ARE LESS INTERRELATED**

- ... Satisfaction with the immediate supervisor
- ... Satisfaction with the overall work situation
- ... Evaluation of the work done by the group
- are all positively and significantly related to satisfaction with pay



### **WHAT THIS MEANS**

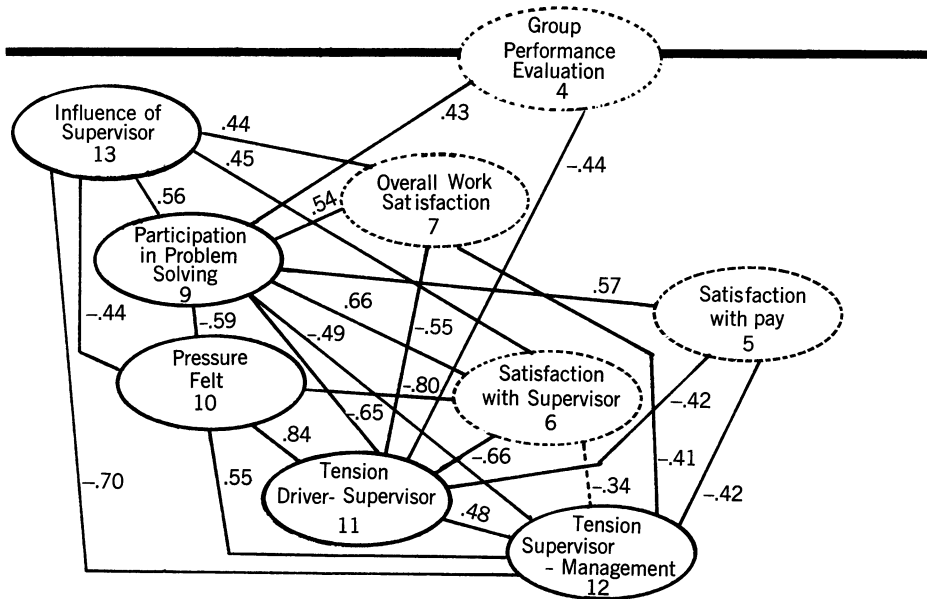
This configuration suggests that sorter team satisfactions and own evaluations are an integral part of the factors that affect the work performance of sorting teams. It is obvious, however, that satisfaction with pay is the crucial integrating variable in this cluster. The relationship of each of the other variables in this cluster depends on pay satisfaction in their relationship to sorter team performance.

Frequency of absence is also directly related to satisfaction with the immediate supervisor. Groups of sorters not satisfied with their night supervisors tend to have higher incidences of absence from the job.

### **WHAT FACTORS AFFECT SATISFACTION AND EVALUATIONS?**

**PARTICIPATION IN PROBLEM-SOLVING IN THE  
WORK SITUATION IS**

**NEGATIVELY RELATED TO PRESSURE AND TENSION  
POSITIVELY RELATED TO WORK SITUATION  
SATISFACTIONS**



Delivery units where drivers describe their supervisors more often as

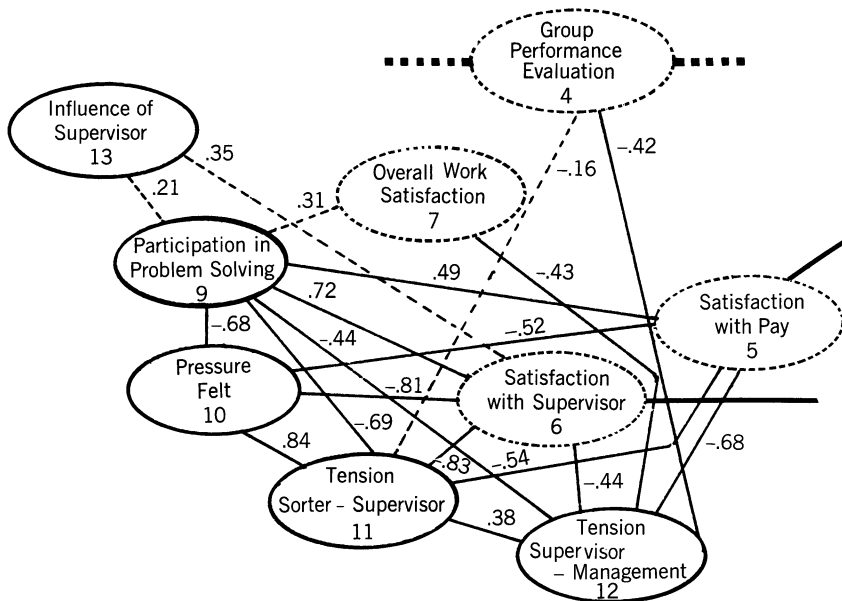
- asking their opinions about work problems
- easy to get ideas across to about improving the job
- open to influence about things the subordinates think are important

that is, having drivers participate in problem solving are also units where there is felt to be

- less pressure for better performance beyond what is thought to be reasonable
- less tension and conflict between the men and the supervisor
- less tension and conflict between the supervisor and higher management
- greater work situation satisfactions

***PARTICIPATION IN PROBLEM-SOLVING IS AS IMPORTANT FOR THE SORTING TEAMS AS FOR THE DELIVERY UNITS***

The pattern of relationships linking participation and work situation satisfactions and pressures for the sorting teams is almost identical with that shown for the drivers.



There are several exceptions —

... As would be expected, participation, pressure and tension are primarily related to satisfaction with pay for the sorting team (the variable previously linked to sorting team performance).

These same variables were previously linked to unit performance evaluation for the delivery drivers (the variable linked to the performance of the delivery units).

... For the sorting teams, the link between unit performance evaluation and tension between sorters and their supervisor was not significant.

## ***THE INFLUENCE OF THE SUPERVISOR***

The drivers were supervised the most directly by the station manager; the sorters by the night supervisors. The latter were under the supervision of the station managers.

Delivery units where there was

- ... participation in decision making
- ... less pressure for unreasonable performance
- ... less tension between their supervisor and top management

were units where the station manager was described

- ... as having more influence on what goes on in the station
- ... as more often characterized as deciding things for himself, rather than leaving it up to his boss.

On the other hand, the influence of the night supervisor with his station manager was not found to be significantly related to the sorting teams' perceptions of their participation in problem-solving or the extent to which they worked in an atmosphere of pressure or tension.

Both drivers and sorters saw the station manager as having more influence in decision-making within the plant than the night supervisors. While influence of the supervisor with the next echelon was not directly related to unit performance for the drivers, it was directly related (.53) to effectiveness for the sorting teams. The effectiveness rating of the night operations obtained from top management may thus simply reflect the quality of relationship between the top management and the night supervisor.

## ***SUMMARY OF FINDINGS THIS FAR***

The **GENERAL ARGUMENT** of the findings so far is —

- ... Measures of unit effectiveness are directly related to worker satisfactions or evaluations of the principal dimensions of the work situation — i.e., pay, supervision, unit performance
- ... Measures of satisfaction are directly related to workers' perceptions of participation in problem-solving and the climate of superior-subordinate relations in the work situation.

**SPECIFIC FINDINGS** from the delivery drivers and sorting teams point out that the dimension of satisfaction or evaluation which is related to effectiveness varies by type of unit —

- ... For the delivery units, the drivers' evaluation of their unit's performance is directly related to the effectiveness of the unit.
- ... For the sorting teams, the sorters' satisfaction with their pay is directly related to the effectiveness of the sorting team
- ... For both types of units, the satisfaction variable linked to effectiveness is in turn directly related to

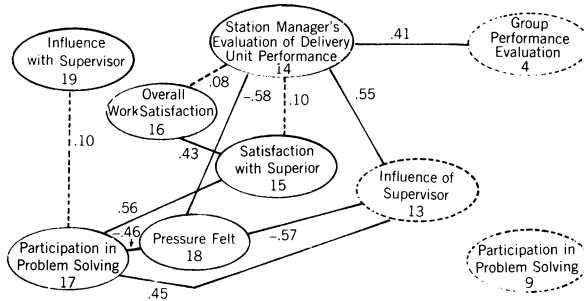
—THE EXTENT TO WHICH THE MEN FEEL THEY GET TO PARTICIPATE  
IN THE SOLUTION OF JOB PROBLEMS

—THE EXTENT TO WHICH THE MEN FEEL THERE IS LITTLE TENSION  
BETWEEN THEMSELVES AND THEIR IMMEDIATE SUPERVISOR

***LET'S NOW GO AHEAD AND SEE HOW THESE  
CLUSTERS OF FINDINGS ARE RELATED TO  
SUPERVISOR'S PERCEPTIONS AND FEELINGS***

## ***THE SUPERVISORS' EVALUATIONS OF THEIR MEN'S PERFORMANCE IS DIRECTLY RELATED TO THEIR MEN'S EVALUATION OF THE UNIT'S PERFORMANCE***

—Station managers who feel their unit is performing well do not feel under pressure and are seen as having greater influence by their men; those who feel their unit is not doing a very good or excellent job do feel under a good deal of pressure beyond what they consider reasonable.



—Station managers who feel they are working under a good deal of pressure are station managers whose drivers say their supervisor has relatively little influence at higher levels.

### ***OTHER FINDINGS THAT MIGHT BE NOTED***

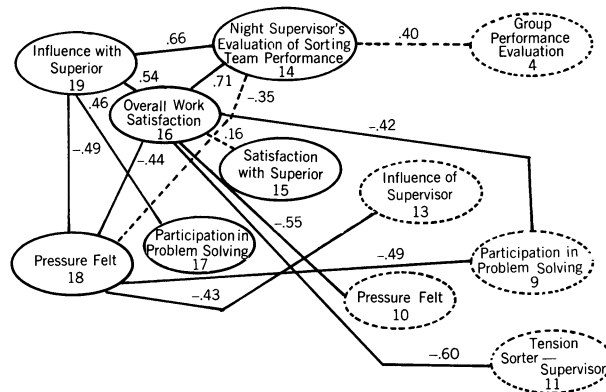
- ... The station managers' evaluations of the performance of their drivers was not related to their overall satisfaction with their work situation or with their immediate superior: the division manager. (Drivers' evaluations of their unit's performance was highly related to their satisfaction with other aspects of their work situation.)
- ... The station managers' perception of their influence with their immediate superior was not related to their satisfaction with their superior nor to their sense of participation in problem-solving. (Their drivers' perception of their influence with the station manager was, however, related to the drivers' satisfaction with participation, felt pressure, and tension.)



# ***THERE IS A TENDENCY FOR THE NIGHT SUPERVISOR'S EVALUATION OF HIS TEAM'S PERFORMANCE ALSO TO BE RELATED TO HIS MEN'S EVALUATION OF THE GROUP'S PERFORMANCE***

—Night supervisors who evaluate their group's performance high are night supervisors who feel they can influence their superior (the station manager).

—Night supervisors who feel they can influence their superior, who feel they have a good deal to say about how things are done, are supervisors who feel they get to participate in problem-solving with their superiors, and who do not feel under an unreasonable amount of pressure.



—As with the supervisors of the delivery units, the night supervisors who feel they are working under a good deal of pressure are the ones whose sorters say their supervisor has relatively little influence at higher levels. These are the same supervisors whom the sorters say do not involve them in any problem-solving regarding the work station.

## **OTHER HIGHLY SIGNIFICANT FINDINGS**

—The night supervisor's evaluations of his team's performance is

... directly related to unit effectiveness (.59) and productivity (.69)

... inversely related to the unit's absence (–.73)

—The night supervisor's evaluation of his team's performance is also directly related to his overall satisfaction with his work situation (.71) and the latter is related to productivity and absences as might be expected.

—The amount of pressure the night supervisor feels he is under is inversely related to the productivity record for the station as a whole.

***NOW HAVING LOOKED AT THE MAJOR LINE OF  
REASONING INTEGRATING THE FINDINGS, WE TURN  
TO THE REVIEW OF OTHER MARGINAL FINDINGS  
THAT ARE RELEVANT***

Information was available on several other classes of factors—

**... RATINGS OF THE PERFORMANCE OF SUPERVISORS BY TOP  
MANAGEMENT**

**... PERCEPTIONS OF SUPERVISORY BEHAVIOR**

**... PERSONAL CHARACTERISTICS AND BACKGROUND DATA ON SUPER-  
VISORS AND UNITS**

**... PERSONALITY MEASURES:    NEEDS AND VALUES**

— and individual measures of perceptions and satisfactions of workers and  
supervisors

**WE LOOK FIRST AT FACTORS RELATED  
TO MANAGEMENT'S EVALUATION OF  
SUPERVISORS AS RECORDED IN COM-  
PANY RECORDS —**

(The reader will want to use the large fold out  
diagrams at the beginning and end of this  
booklet to follow the remainder of this argu-  
ment.)

## **MANAGEMENT APPRAISAL RATINGS**

### **MANAGEMENT APPRAISALS FOR THE SUPERVISORS OF THE DELIVERY UNITS ARE—**

- NOT RELATED TO THE MEASURES OF UNIT EFFECTIVENESS. (IT IS THE SUPERVISOR, NOT THE UNIT THAT IS BEING RATED.)
- BUT MANAGEMENT APPRAISALS ARE RELATED TO THE STATION MANAGER'S
  - AGE (— .47 with overall performance and — .51 with summary appraisal)
  - NEED FOR INDEPENDENCE (.55 with overall performance)
  - PERCEPTIONS OF HIS PARTICIPATION IN PROBLEM-SOLVING (.49 with summary appraisal)
  - FEELINGS OF BEING UNDER PRESSURE (— .39 with overall performance and — .43 with summary appraisal)
  - FREQUENCY OF INDIVIDUAL CONTACTS WITH THE DRIVERS AS ESTIMATED BY THE DRIVERS (.45 with overall performance)

Individual station managers appraised by top management as high on these ratings are those

- ... who are younger
- ... who have greater need for independence, want to be left more on their own to do things
- ... who feel they participate with their superior, the division manager, in making decisions regarding work problems
- ... who do not feel under pressure that they feel is unreasonable
- ... whose drivers say their supervisors more often have contact with them individually.

### **MANAGEMENT APPRAISALS FOR THE SUPERVISORS OF THE SORTING TEAMS ARE**

- NOT RELATED TO THE MEASURES OF UNIT EFFECTIVENESS, PERCEPTIONS OF HIS PARTICIPATION IN PROBLEM SOLVING, FEELINGS OF BEING UNDER PRESSURE, OR HIS NEED FOR INDEPENDENCE
- BUT ARE RELATED TO THE NIGHT SUPERVISOR'S AGE (— .42 with summary appraisal) AND SORTERS' ESTIMATE OF FREQUENCY OF INDIVIDUAL CONTACTS WITH THE SUPERVISOR (+ .49, + .45 with overall performance and summary appraisal, respectively)

## **ATTITUDES TOWARD MIDDLE MANAGEMENT**

### **AN ADDITIONAL DIMENSION OF WORKER SATISFACTION WORTH CONSIDERING IS THE WORKER'S ATTITUDE TOWARD HIS DIVISION MANAGER**

**FOR THE DAY DELIVERY OPERATION**, we found considerable interrelationship between the drivers' satisfaction with their pay, their satisfaction with immediate superior, overall work satisfaction, and their evaluation of the work unit's performance. (See page 18 and the large fold out sheet at the front.)

**FOR THE NIGHT SORTING OPERATION**, we found fewer interrelationships among these dimensions of the workers' satisfactions. That is, while overall satisfaction with the work situation, satisfaction with the immediate supervisor, and group performance evaluation were each related to satisfaction with pay, they were not significantly related to each other.

**FOR THE MEN ON BOTH THE DAY AND THE NIGHT OPERATIONS**, there was an additional aspect of the job that was significantly associated with their overall satisfaction with the work situation—namely, their satisfaction with their division manager (shown in the lower right hand corner of each large correlograph).

**FOR THE MEN ON THE NIGHT OPERATION**, satisfaction with pay was also highly related to their attitude toward middle management.

### **FOR THE DELIVERY UNITS, THERE WAS AN UNEXPECTED RELATIONSHIP BETWEEN THE DRIVERS' ATTITUDES TOWARD MIDDLE MANAGEMENT AND THE PRODUCTIVITY AND ABSENCE RATES OF THE STATION —**

Delivery units whose drivers felt their division manager was not very good in dealing with people and had an incomplete understanding of the employee's viewpoint were units having higher productivity and lower absence rates than those units whose drivers felt their division manager was better in dealing with people and had a fuller understanding of the employee's viewpoint.

Equally unexpected—but instructive for understanding this sub-pattern—was the finding that attitudes toward middle management were negatively related to the frequency of individual contact between the driver and his supervisor to discuss various aspects of the employee's work and the frequency of group meetings.

## **WHAT THIS PROBABLY MEANS**

These findings suggest that as the new top plant management began to tighten up the organization to reduce costs, it had the division managers pressure station managers to hold more formal group meetings with the men, and talk and ride with individual drivers to indicate what would now be expected of the worker. The men sensing that the more frequent formal contact by their supervisors with them had been ordered by higher management, were less satisfied with the higher and middle levels of management, but recognized that the better performance in getting the work done was required.

It is particularly significant that the station manager who says he frequently asks his drivers their opinions about how to handle work problems is more often the manager of a delivery unit whose drivers feel that his superior—the division manager—has a better understanding of their problems as employees and is better in dealing with people than the station manager who does not say that he asks his men's opinions about work problems.

### **FOR THE SORTING TEAMS THE STORY SEEMS TO BE DIFFERENT**

There was no relationship between the sorters' attitudes toward higher management and their group's effectiveness measures.

Sorting teams which were relatively satisfied with their station manager's understanding of the men's problems and felt he did a good job in dealing with people were more likely to have supervisors who

- did **not** report feeling under pressure (—,46)
- did **not** say that they frequently asked sorters' opinions about work problems (—,47)
- did say that there was frequent contact between them and their sorters (.53)

## **WHAT THIS PROBABLY MEANS**

Supervisors of drivers who say they frequently ask their men's opinion about work problems are more often likely to have units in which the men are more satisfied with middle management's understanding of the problems of the men. The opposite finding appears to be true for the night supervisors and their sorting teams.

## ***DIFFERENTIAL PERCEPTIONS***

### **ESTIMATES OF FREQUENCY OF CONTACT BY SUPERVISORS AND THEIR MEN DO NOT AGREE**

In both situations, we find that there is little relationship between the views of supervisors and their men as to frequency of—

- ... group meetings being held between the supervisor and the men
- ... discussions of various aspects of the work with the men individually
- ... the superior asking the men their opinion when a work problem comes up

These findings leave us with a question about whether the report of the supervisors or their men—or neither—is accurate. Since two of these three questions asked the respondents to answer in terms of identical units of time (e.g., never to once a day) and there was no agreement, we must assume these questions were answered more subjectively than objectively. There being no actual record of contacts to compare with these estimates, we simply note the pattern of relationships between these two differential sets of perceptions and other factors.

**FOR THE DAY DELIVERY OPERATION**, we find the station manager's estimate of the frequency with which he states he holds group meetings with his drivers is **positively** related to—

- ... measures of unit effectiveness (.43)
- ... measures of station productivity (.58)

Moreover, the extent to which the station manager says his drivers feel free to discuss personal problems with him is also directly related to unit effectiveness (.48).

### **RELATED FACT**

- ... In the section on Attitudes toward Middle Management, it was noted that frequency of group meetings as seen by the drivers was negatively related to the drivers' attitudes toward the division manager. This suggests that the drivers thought that they were under pressure from division managers. However, the frequency of group meetings between station managers and drivers was positively related to the drivers' satisfaction with their station managers (+.40).

**FOR THE NIGHT SORTING OPERATION**, we find the night supervisor's estimate of the frequency with which he states he holds group meetings with his sorters is **negatively** related to the—

... measure of sorting team effectiveness (— .47)

... record of station productivity (— .56)

and **positively** related to—

... measures of absences (.53)

However, the extent to which the night supervisor says he makes it free for his sorters to discuss personal problems with him is positively related to station productivity (.40).

## **RELATED FACTS**

... Night supervisors who report they have group meetings the most frequently are also more likely to—

—evaluate the work of their sorting team lower

—say they are under more unreasonable pressure to get the work out

—report that they make it less free for their men to talk with them about their personal problems

—report that they are less likely to feel they understand the viewpoint of the men under them.

... Pressure for higher performance as felt by the night supervisor was negatively related to sorting team productivity.

## **WHAT THIS PROBABLY MEANS**

Night supervisors whose operations are not doing too well (have lower productivity) are under pressure from station managers for higher performance; these night supervisors in turn hold formal group meetings with their sorting teams to emphasize the importance of doing a better job.

Higher performance night operations have supervisors who are more likely to understand employee viewpoints, who make it very free for subordinates to discuss personal problems with them. This relationship between superior and subordinate was not established through formal group meetings.

# **PERSONAL CHARACTERISTICS OF SUPERVISORS AND UNITS**

## **FOR THE STATION MANAGERS AND DELIVERY UNITS**

The length of service of the station manager appears to be an important factor. It is significantly related to a number of other factors of interest in this analysis.

As would be expected the length of service of the supervisor is positively related to his age ( $r = +.60$ ). However, it is negatively correlated with the average age of his work group ( $r = -.41$ ). The length of service of the supervisor is also positively related to the amount of unreasonable pressure and tension felt by their subordinates, and negatively related to the frequency of group meetings and employee satisfaction with their supervisors. We should note here that the length of service of the drivers in the work group is positively correlated with the frequency of contacts (group or individual) as seen by the drivers. We also find that the supervisor's age is negatively related to how higher management rates them on their regular management appraisals.

## **WHAT THIS PROBABLY MEANS**

The older, longer service supervisors directing the activities of delivery units composed of younger men tend to use group meetings to place pressure for high performance on their men. This results in increased tension between the drivers and their station managers and increased driver dissatisfaction with supervision.

## **FURTHER FINDINGS—**

Other variables concerning both the station manager and the driver units do **not** seem to be related systematically to the clusters of variables already presented. There are some exceptions—

... The size of the work unit is negatively correlated with the frequency of individual contacts as seen by the drivers ( $r = -.50$ ).

The larger the group of drivers working out of an individual station, the less likely the drivers are to say that their superior discusses various aspects of the work with them individually. Size itself seems to be an inhibiting factor in communication.



- ... The average age of the work unit is positively related to the station manager's satisfaction with his division manager ( $r = +.44$ ).
- ... The average length of service of the men in the driver units is negatively related to attitude toward middle management ( $r = -.56$ ) and negatively related to frequency of absence ( $r = -.39$ ).

Men in stations composed of drivers with longer years of service in the company are less likely to feel that their division manager understands the employee's viewpoint and to be good in dealing with people. They are also less likely to be absent from the job. Units with men of longer average length of service are units which have younger supervisors ( $r = -.40$ ). These are also units whose drivers feel they have more contact with their supervisors ( $r = +.45, +.47$ ) — this contact is probably more of a policing type since the drivers of these units are also more likely to say that they have supervisors who ask their opinions less frequently ( $r = -.56$ ).

### ***FOR THE NIGHT SUPERVISORS AND SORTING TEAMS***

Length of service is again an important factor for the supervisor. Longer service night supervisors are older ( $r = +.82$ ), and less educated ( $r = -.42$ ). They also seem to be a source of tension ( $r = +.40$ ) and pressure ( $r = +.41$ ) felt by their sorting team members, and, in part, the reason for the dissatisfaction with pay their men manifest.

### ***WHAT THIS PROBABLY MEANS***

As in the case of the longer service station manager, the longer service night supervisors are also more likely to be using pressure and tension producing tactics in order to handle their subordinates in the continuing day to day situation but at a negative cost to the relationship between themselves and their men.

## **CHARACTERISTICS OF THE SORTING TEAMS**

The average length of service of the group members and the average age of the group members seem to be important descriptive factors in this picture.

The average age of the men in the sorting groups is—

- positively related to the level of authoritarianism their supervisor has ( $r = +.45$ )
- positively related to the amount of pressure their supervisor feels on himself ( $r = +.50$ )
- positively related to the amount of unreasonable pressure for performance the men feel ( $r = +.47$ )
- negatively related to the supervisor's satisfaction with his overall work situation ( $r = -.42$ )
- positively related to the supervisor's satisfaction with his station manager ( $r = +.41$ )
- positively related to how much the supervisor says that he asks his sorters' opinions on work problems ( $r = +.46$ )
- negatively related to the amount of influence the night supervisor feels he has with his superior ( $r = -.57$ ).

## **WHAT THIS MEANS**

The sorting teams with older men are more likely to find they have supervisors with an authoritarian orientation who get pressure for performance from their station managers and pass it on to the sorters. These older groups have station managers whom they are more likely to feel have less influence with their superiors. The night supervisors themselves are less satisfied with their overall work situation, but are more satisfied with their superiors (as people with authoritarian orientations in a hierarchy frequently are). The higher the average age of the sorters in a team, the more likely the night supervisor is to report that he asks his men their opinions about work problems. However, since this behavior on the part of the night supervisor is negatively related to sorters' attitudes toward middle management and their satisfaction with their overall work situation and pay, this act of asking subordinate's opinions may be seen by sorters as a weakness or as an attempt at manipulation by the supervisor.

The average length of service of the sorting team groups

- is positively correlated with both the men's productivity ( $r = +.48$ ), and there is a strong tendency for length of service to be related to the night supervisor's evaluation of his group ( $r = +.40$ ).
- is positively correlated with the night supervisor's estimate of the amount of influence the station manager has ( $r = +.48$ ).
- is positively related to the size of the sorting teams ( $r = +.59$ ).
- is negatively related to both the level of intelligence of their night supervisors ( $r = -.45$ ) and the level of value of achievement of their night supervisors ( $r = -.41$ ).

## ***WHAT THIS PROBABLY MEANS***

The longer the men have worked together, the better their performance record is as evaluated both by the facts and by their supervisors. We also note that the teams with the longer average length of service are larger teams. The supervisors of these sorting teams feel they have more influence with their superiors, yet they score less highly on written intelligence tests and place less value on achievement than supervisors of shorter service teams.

# ***SUPERVISORS' VALUES AND NEEDS***

## ***FOR THE SUPERVISORS OF THE DELIVERY UNITS***

- ... Station managers scoring high on an eight-item scale designed to measure an individual's orientation toward high achievement were more likely to be supervisors of delivery units whose drivers evaluated their unit's performance as high (+.43) than are station managers scoring lower on this measure.

Thus for the day operations, it appears that supervisors having high achievement values are more likely to be found directing the work of a unit whose members evaluate their group as doing better than other groups in getting the job done.

- ... Station managers who demonstrated a high need for independence were found to be more often rated high in overall performance by top management in the company's regular appraisal program (.55) than those with a lower need for independence. These station managers also evaluated their work groups' performance more highly.
- ... Some surprising findings were that supervisors scoring high on an authoritarianism scale were more likely than those supervisors scoring low to have stations in which the drivers—
  - evaluated the performance of their unit as high (.47)
  - stated that they were satisfied with human relations skills of their immediate supervisor (.41)
  - indicated they were satisfied with their future in the company and with their job and the company in general (.42)
  - indicated they felt **less** pressure for high performance, **less** tension between the men and the station manager and **less** tension between the station manager and higher management

## ***FOR THE SUPERVISORS OF THE SORTING TEAMS***

... Night supervisors scoring high on an authoritarianism scale were more likely than those night supervisors scoring low to have sorting teams whose members—

—stated that they were not satisfied with the human relations skills of their supervisor (—.41)

—stated that their supervisor did not involve them in problem solving within the group (—.58)

Night supervisors who scored highly on the authoritarianism measure are also more likely to be supervisors who did not feel their station managers had a great deal of influence about what went on or enough authority to decide things (—.46)

The authoritarianism scale was negatively related to a 17 item scale that was constructed about how to supervise in a considerate manner (—.43).

## ***RECAP OF OBJECTIVES AND FINDINGS***

It has been the objective of this analysis to present and map out visually the complex patterns of interrelationships among measures derived from company records and from questionnaires given to supervisors and subordinates in two different types of work groups within the same company. The questionnaire measures included workers' and supervisors' perceptions of and satisfactions with various aspects of their job situation. The measures from the company records included data on productivity and absences. The analysis deals with the similarities and differences among the interrelationships of these measures for the day and night operations of a large package delivery organization. The day operation, concerned with the delivery of packages, is a highly discrete operation with almost no face-to-face interaction between the drivers and their supervisors and little interdependence of task. The night operation, on the other hand, involves the handling, the sorting, positioning, listing of packages and their placement in trucks, and provides for a good deal of interaction and interdependence of tasks.

Some factors which are associated in the same general manner were found in both of these markedly different situations, and of course some were found which were not. The results indicate that the measures of the effectiveness of a unit are directly related to at least one of the major dimensions of the worker's evaluation or satisfaction with his work situation. The findings suggest that the specific measure of satisfaction or evaluation which is related to effectiveness may vary by situation. But whatever measure is operative, it, in turn, is highly related to the workers' perceptions of the extent to which their supervisor involves them in problem solving and to the amount of intra-organizational tension and pressure they feel.

The supervisor's evaluation of his work situation appears to be related to the effectiveness of the unit he is responsible for, either directly or indirectly, through the attitudes of the men in his group.

These are some of the principal findings which appear to hold for both the day and night, the highly discrete and the more highly interdependent work situations. Illustrative findings unique to one situation or the other are (1) drivers who have negative attitudes toward middle management are more likely to be in high effectiveness units (this does not hold for the night operators), (2) supervisors of the day operation with authoritarian orientations are more likely to have men who are satisfied with their work situation (just the opposite is true for the night operators).

Methodologically, this booklet has attempted to portray much of the social complexity which was existent in the delivery stations at the specific time the measurements were taken. In effect, the objective has been to take a snapshot of the complex interrelationships among the principal sets of factors and variables measured. The technique of the correlograph has been introduced to show visually how this system of relationships appears to be organized in these situations at this one time.

A given correlation between a measure of supervisory behavior and work group performance may reflect the fact that supervisory behavior causes performances, or that the performance of a group determines the kind of supervision that it will receive, or that both supervisory behavior and performance are caused by other variables which are not controlled or measured in this analysis. The correlational nature of this study makes it impossible, of course, to establish cause and effect relationships among the factors. Consequently, we have not drawn any arrows on the connecting lines. Nonetheless, the charts have been arranged to suggest that the most likely causal direction is from left to right, with changes in supervisory behavior occurring first, followed by changes in work group effectiveness and productivity. We would recognize, of course, that this is an overly-simplified model of causation. In any dynamic representation of the forces at work there would undoubtedly be feedback and circular reinforcement of trends, with the direction of causality varying at different times.

Our intent has been to reflect the complex dynamic processes involved in the functioning of a part of a formal organization as fully and as precisely as possible by means of a static picture of the relationships existing among variables at one point in time. It is our feeling that such correlographs are useful in helping managers and researchers understand the complicated process and factors affecting the human side of an organization. If the results seem complex, they probably only reflect what many of us have long felt intuitively—that the coordination of individual needs with organizational objectives is an extremely complex process.

## ***A FINAL METHODOLOGICAL NOTE***

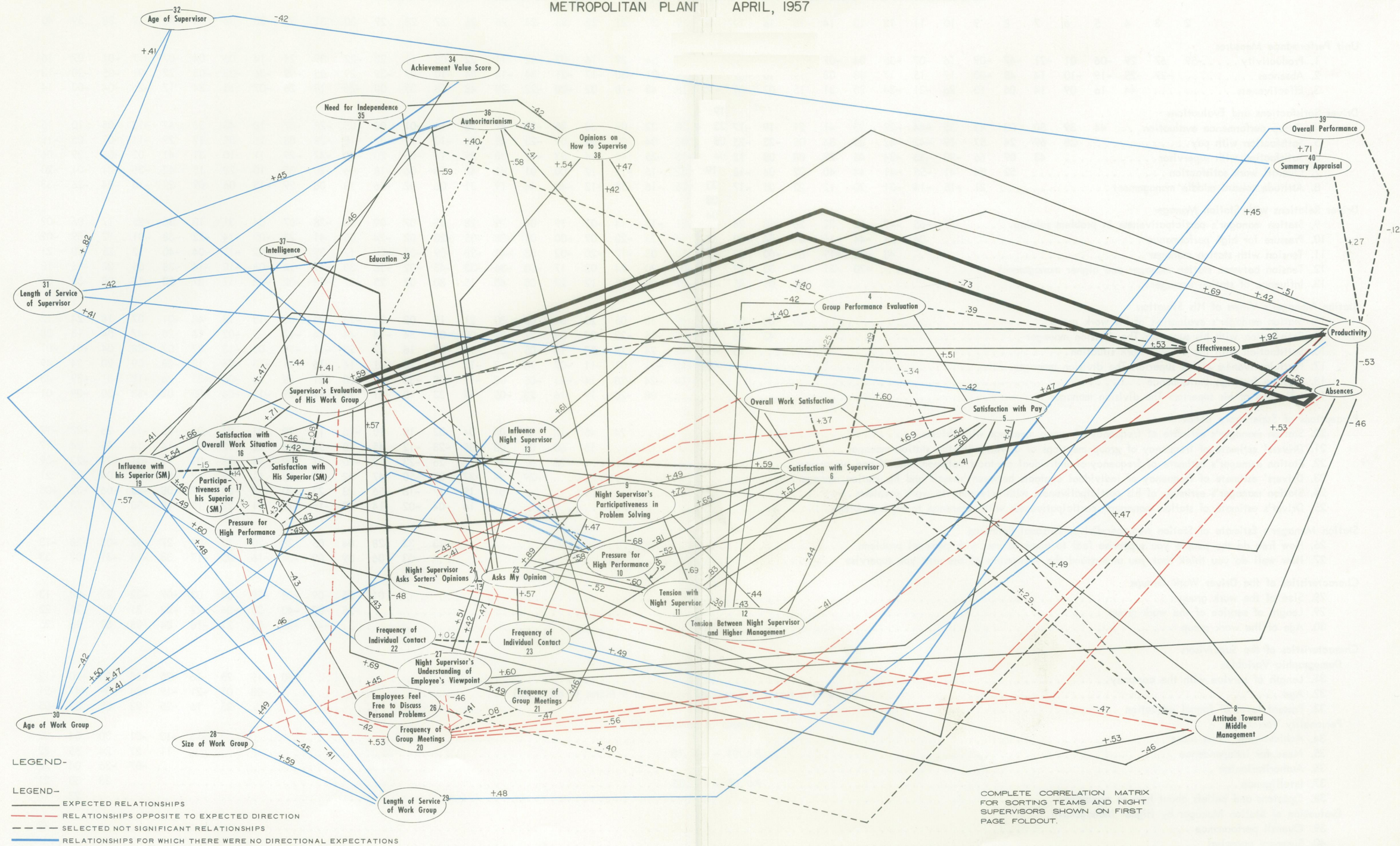
It is proper to remind the reader again that our data were collected at a single point in time when the total organization was just beginning to undergo a number of changes. A new plant manager and delivery superintendent had just been appointed and had made a first round of changes in supervisory personnel in one division; the 1957-58 economic turn-down was beginning to be felt. With both of these factors affecting the situation, it seems likely that the interrelationships among the variables we were investigating were also being affected.

It is especially important to note that any significant difference between the management philosophy of the new appointees and their predecessors would probably be reflected first in the perceptions, the satisfactions, and the behavior of the division managers, then the supervisors, the men and finally the company's records of each unit's performance. Thus, we assume that the effect of such changes would move through our correlograph from left to right, affecting different constellations of variables successively—probably at different rates. This may account for some of the relationships that were found that had not been expected.

Now that we have been able to chart the significant interrelationships among our variables as of one point in time, the next methodological step forward is also clear. We need to have a number of such "snap shots" of our system of variables as of time<sub>1</sub>, time<sub>2</sub>, time<sub>3</sub>, and so on. We can then investigate how stable our relationships are from one time to another. But more importantly we could correlate changes in one variable with changes in another variable from one time to another rather than as of a particular time. It would be from the study of these dynamic correlations that we could advance more rapidly toward a better understanding of the actual interrelationship and functioning of supervisory behavior, and subordinates' perceptions, motivations, attitudes, and behavior. It is this type of an approach which should provide us with a totally new view of organizations.



CORRELOGRAPH FOR NIGHT-SORTING TEAMS OPERATION  
METROPOLITAN PLANT APRIL, 1957





## 41C

41D

