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A PROGRAM TO REDUCE CORONARY HEART DISEASE RISK BY ALTERING JOB STRESSES

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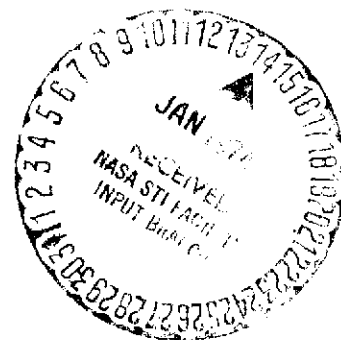
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by

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Research Center for Group Dynamics
Institute for Social Research
The University of Michigan
September 1973

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ABSTRACT

A PROGRAM TO REDUCE CORONARY HEART DISEASE RISK BY ALTERING JOB STRESSES

by

Douglas Bruce Campbell

Chairman: John R. P. French, Jr.

Previous literature suggests that coronary heart disease may be associated with job stresses, and that these stresses result from a mis-fit between the supplies or demands of the job environment and the needs or abilities of the person. The link between job stress and coronary heart disease is achieved through psychological and physiological strains that both are associated with job stress and are risk factors in heart disease. This study reports the design, implementation, and evaluation of a program attempting to reduce job stress by improving person-environment fit with respect to job aspects such as work load, responsibility, and interpersonal relationships.

The research design was a field experiment with six experimental and five control work groups from NASA's Goddard Space Flight Center. In order to assess the effects of the program, measures of both stress (i.e., person-environment fit with respect to job aspects including those mentioned above) and strain were collected at three points in time--just prior to the program, immediately after the program, and three months after completion of the program. Measures of strain included systolic and diastolic blood pressure, determinations of glucose, cholesterol, and uric acid in the plasma, job satisfaction, and job-related self esteem.

The experimental manipulation (the program) consisted of the

feedback, to each Experimental work group, of their individual- and group-level stress data from the pre-program measurement, and a series of ten weekly meetings to identify and solve, in a participative manner, problems that the group members felt were stressful in their work setting. In order to maximize the practical benefits of the program, each group was allowed to direct the course of its own program; i.e., to select for attention those problems it felt were most stressful in its own work environment and thus the particular stress areas to be addressed directly. So while the process of the program in each group was roughly comparable, the content (stress areas) actually treated during the program was not.

Because the program content varied among the Experimental groups and because each Experimental group was not matched with a particular Control group, results are reported for each Experimental group compared to all Controls, as well as for all Experimentals against all Controls. Effects on stresses were mixed, but more often than not showed a worse person-environment fit for Experimentals compared to Controls. These results displayed themselves mainly in the first post-program measurement; fewer such results were found in the second post-program measurement. Few effects on strain were found. The findings were interpreted in light of both program incidents within specific Experimental groups and general aspects of the program common to the Experimental groups. Additional analyses indicated both that good person-environment fit with respect to participation predicts to good fit with respect to other job aspects over a three month interval and that stress causes strain, rather than the reverse.

It was concluded that the program, as carried out, was not effective in reducing risk factors in coronary heart disease, but that

the program, as planned, did not receive an adequate test of its feasibility. Several recommendations are made for improving the possibilities of success in future efforts of this kind. The recommendations include participation in the program of an entire "vertical slice" of the organization, more adequate training of both staff and participants, a longer program with more time commitment from staff, and better program documentation to assist in interpreting outcomes.

A PROGRAM TO REDUCE CORONARY HEART DISEASE
RISK BY ALTERING JOB STRESSES

by
Douglas Bruce Campbell

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The final typing of this manuscript was the work of Linda Shepard. Her cheerful and cooperative attitude in carrying out the task was appreciated.

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TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF APPENDICES	viii
 CHAPTER	
1. INTRODUCTION AND REVIEW OF THE LITERATURE	1
A Model of the Theory for this Research	4
Stresses and their Relation to Strains	7
Strains as Risk Factors in Heart Disease	13
The Experimental Manipulations in the Context of Organization Interventions	16
Hypotheses to be Tested	26
2. METHOD	28
Research Design	28
The Experimental Intervention	30
Measures of Stress	35
Measures of Strain	39
Documentation of the Intervention Program	42
The Analyses	43
3. PLANNING AND IMPLEMENTING THE EXPERIMENT	44
Phase I: Early Planning Activities	45
Phase II: Final Planning Activities	50
Phase III: Implementing the Program	54
4. MEETING SUMMARIES OF EXPERIMENTAL GROUPS	57
Group A	58
Group B	65
Groups C and D	70
Group C (continued)	72
Group D (continued)	75
Group E	78
Group F	83

CHAPTER	Page
5. RETROSPECTIVE PICTURES OF EXPERIMENTAL GROUPS	97
Group A	98
Group B	101
Group C	104
Group D	107
Group E	109
Group F	113
Conclusion	115
6. RESULTS	118
The Effects of the Program	122
The Predictive Power of the P-E Fit Measures . .	159
7. DISCUSSION AND IMPLICATIONS	166
Pre-Program Planning and Design	166
Documentation and Measurement	169
Staffing and Training	172
Program Activities	175
In Conclusion	177
REFERENCES	179
APPENDICES	187

LIST OF TABLES

Table	Page
1. Characteristics of the Experimental and Control Groups at Time 1	32
2. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Group A vs. Controls)	123
3. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Group B vs. Controls)	129
4. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Group C vs. Controls)	134
5. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Group D vs. Controls)	138
6. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Group E vs. Controls)	141
7. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Group F vs. Controls)	146
8. Adjusted Means Showing Effects on Stresses and Strains at Time 2 and Time 3 (Experimentals vs. Controls)	150

LIST OF FIGURES

Figure		Page
1.	A Schematic Diagram of the Theory for the Experiment and for the Findings on which it was Based	5
2.	Some Organization Interventions and Job Stresses that they may Affect	19
3.	A Chronology of the Experiment	46
4.	PMR data for Group A	91
5.	PMR data for Group B	92
6.	PMR data for Group C	93
7.	PMR data for Group D	94
8.	PMR data for Group E	95
9.	PMR data for Group F	96
10.	Prediction of P-E Fit Measures over a Three-Month Time Interval	163

LIST OF APPENDICES

Appendix	Page
A. FEEDBACK FORMS	187
B. SAMPLE AGENDAS FOR PROGRAM MEETINGS	193
C. MEASURES OF STRESS	196
D. MEASURES OF PSYCHOLOGICAL STRAIN	201
E. DOCUMENTATION FORMS	206
F. PARTICIPANTS' COMMENTS AT CLOSE OF PROGRAM	213

CHAPTER 1

INTRODUCTION AND REVIEW OF THE LITERATURE

In our society today, most employed persons work within an organization of some sort. The individual makes a considerable investment, in time and energy, in his or her work. While certain rewards (financial and other) flow from a person's involvement with an organization, this involvement can have its costs, too, including losses in psychological or physiological well-being. Such losses to the individual surely are costly to the organization as well, although the means of accounting for such costs are just being developed (Brummet, Pyle, and Flamholtz, 1968). One particular loss of well-being, the development of coronary heart disease including heart attack, is a severe cost to the individual and to the employing organization as well. Coronary heart disease as an ultimate result of stresses experienced in organizational life is the major concern behind this study.

The importance of this disease in terms of death rates, disease rates, and costs, can hardly be overestimated. In this country each year, over 900,000 persons die of heart disease and primarily coronary heart disease (Ostfeld, 1967). In 1967, coronary heart disease caused 31% of all deaths in the United States (U.S. Public Health Service, 1968). According to the President's Commission on Heart Disease, Cancer, and Stroke (1964), the costs of all

forms of heart disease (the sum of direct costs for medical care plus losses of output by members of the labor force due to heart disease) amounted to \$22.4 billion, or 4% of the GNP, in 1963.

But what evidence is there that this disease is related to a person's environment, especially the job environment? The idea that human disease is related to man's environment is certainly not new. It was expressed by Hippocrates almost 2400 years ago, and intervention studies as an epidemiologic methodology go back to the late 1700s (MacMahon and Pugh, 1970). In a study of 100 coronary patients and an equal number of controls, Russek and Zohman (1958) found that stress associated with work accounted for greater differences between the two groups than did differences in diet, heredity, obesity, exercise, or smoking. Similar data have been reported by Van Der Valk and Groen (1967).

Another study by Pearson and Joseph (1963) compared 20 myocardial infarct patients with age-matched controls who were out-patients in the gastrointestinal unit of a hospital. In interviews with these patients, the intensity and frequency of stresses from work, travel to and from work, home life, and leisure were assessed. Out of the 20 coronary patients, 16 reported more overall stress than their matched controls. The authors noted that these stresses centered around the work situation and had more to do with the nature of interpersonal relationships in the job than with the more structural, task demands of the work.

The methodology of the above studies leaves something to be desired. For example, they obviously include only the survivors of coronary attacks and rely entirely on retrospective reports by

the patients. But the findings are consistent and indicate that job stress may play a relatively important role in the lives of people with coronary heart disease.

Other studies indicate that stresses of the job play a significant role in the etiology of coronary disease. Liljefors (1970) and Liljefors and Rahe (1970) studied pairs of monozygotic and dizygotic twins, in which one member of each pair had a more severe history of coronary heart disease than the other. They found that interview scores of satisfaction with work differentiated significantly between the members of the pairs. Additional studies have dealt with the effects of differing degrees of job stress on individuals. Such job characteristics as overload and deadlines, for example, have been shown to be associated with heart disease and related physiological risk factors in studies of several occupational groups, including tax accountants (Friedman, Rosenman, and Carroll, 1958) and white collar workers administering contracts and handling personnel transactions (Caplan and French, 1968).

A number of studies of this last type, in which relationships between particular job stresses and particular risk factors are examined, have been carried out over several years by staff associated with the Institute for Social Research, The University of Michigan. The results of that program of research, as they pertain to organizational stresses that produce psychological and physiological strains leading to coronary heart disease, are presented by French and Caplan (1972). This study is a natural outgrowth of that program of research. Given an accumulation of research findings, it was decided that it was time to devise an intervention, in which attempts

to change job stresses were made and any accompanying changes in strains (risk factors) were studied. And so was born the intervention program to be reported here.

A Model of the Theory for this Research

An outline of the theory and research strategy that guided the program of studies leading up to this one, is discussed elsewhere by Caplan (1971) and French and Caplan (1972). They present a theoretical model of how organizational stresses affect individual strains contributing to coronary heart disease. The model, as presented by them, includes a number of variables that were not foci of this study. These extra variables (including personality type and objective, in addition to subjective, measures of stress) are important in understanding the fuller, more complex picture of how stress may lead to heart disease. But in a small-scale feasibility experiment, such as the one to be reported here, the totality of variables that make up the more complex model could not be treated and measured. For this reason, we have displayed a simplified version of the model in Figure 1. This version includes the variables that were of primary consideration in this study, and we shall now describe that model, as it represents the theory for this research. Following this description, we shall review the relevant literature concerning past research on these variables.

Arrow 1 represents the central set of hypotheses that job stresses of various kinds affect one or more of the psychological and physiological strains. Each specific hypothesized relationship is not presented here, but previous findings on these relationships

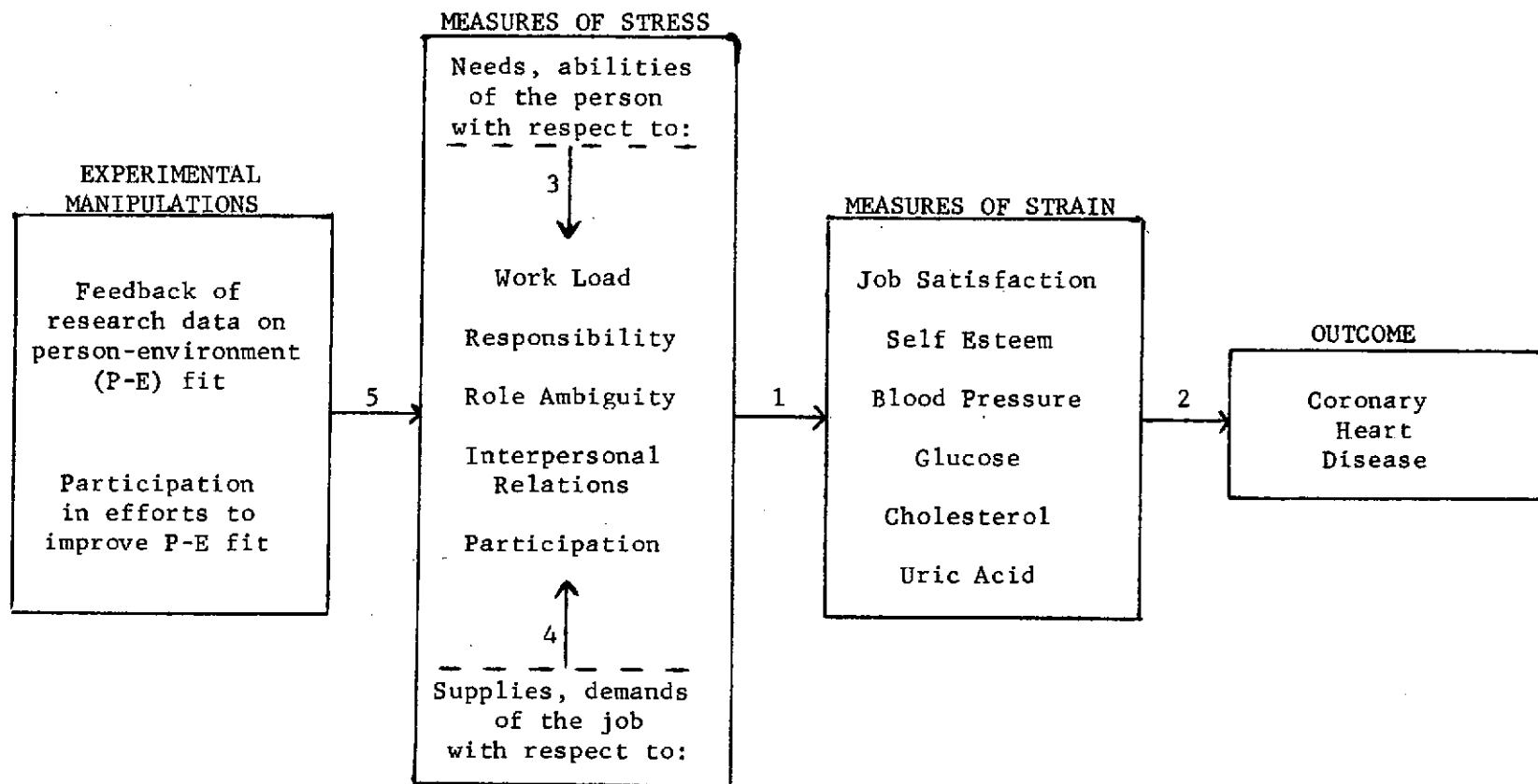


Figure 1. A schematic diagram of the theory for the experiment and for the findings on which it was based.

will be reviewed later, and Caplan (1971) presents an especially exhaustive review of such findings. These strains, in turn, are hypothesized to be risk factors in heart disease as indicated by Arrow 2. Some of the strains, blood pressure and cholesterol for example, are generally accepted as risk factors. Others, like self esteem, are plausible hypotheses, but there is no direct evidence that they are risk factors in heart disease. In a later section we shall consider the extent to which each of the strains can be considered a risk factor in heart disease.

Arrows 3 and 4 represent qualifications of our central set of hypotheses about the effects of stress on strain. How a person reacts to job stress, i.e., whether he shows strain or not, is a function both of the supplies or demands of the job and of the needs or abilities of the person. So it is the goodness of fit between the person and the job environment (P-E fit) that determines the amount of strain. This position is in accord with the field-theoretical assumption that the behavior and the state of the person is influenced by the interactive effects of the environment and the characteristics of the person. Such a characterization of the cause of strain has been developed and conceptualized by a number of theorists (e.g., French, Rodgers, and Cobb, in press; Lewin, 1951). Evidence for the validity of this view will be presented in the next section and may be found elsewhere as well (e.g., French et al., in press).

Finally, Arrow 5 shows the point of impact of the intended experimental manipulation or intervention. As indicated in Figure 1, the intervention involved the feedback of data on person-environment fit with respect to the various stresses, and the use of that data

by work groups, in a series of participative meetings, to solve problems of their work situations in such a way that individuals' P-E fit would be improved. Evidence for the use of participation as one of the principles of the intervention will be discussed in the next section. The principle of data feedback is based in the work of Mann (1957, 1968), and has led, for example, to efforts to develop a standardized organization-assessment instrument that can provide appropriate data feedback for a wide variety of organizations (Taylor and Bowers, 1972). Indeed, the Mann feedback procedure, as described by Katz and Kahn (1966), is an accurate "pocket description" of this intervention program: ". . . group discussion of facts and figures in a task-oriented atmosphere where people were seeking to analyze the problem, identify possible causes as objectively as possible, and agree upon possible solutions." (p. 419).

Stresses and their Relation to Strains

This section contains an overview of past findings on the relationships between stresses and strains. This review will confine itself to the most pertinent findings on the stresses and strains measured in this study. As mentioned earlier, Caplan (1971) presents a most comprehensive review of these findings and still others regarding stresses and strains not measured in this study. We shall not attempt to duplicate that presentation. Each part of this section reviews findings concerning one of the general stress areas found in Figure 1. We shall be mainly concerned with findings on P-E fit with respect to the stresses, since this study was an attempt to improve P-E fit and examine any ensuing changes in strains. The reader who

wishes to examine findings concerning only environmental measures of stress should again refer to Caplan.

Work Load

Work load, as conceptualized and measured in this study, is of two types: quantitative and qualitative. Quantitative work load refers to the amount of work to be done, while qualitative work load refers to the difficulty of that work.

Caplan's study used the same measures of quantitative and qualitative work load used in this study. We shall review those findings first. Although Caplan found no results using the total indices of P-E fit (because nearly everyone reported wanting more work load than they had), he did find some significant results using individual items. P-E fit with respect to two items--"The amount of time you spend in meetings" and "The amount of time you have"--was significantly related to cholesterol level ($\eta^2=.27$, $p < .05$ and $\eta^2=.32$, $p < .01$ respectively). In other words, people reporting good fit with respect to these two items had lower cholesterol than those reporting poor fit in either direction.

Several studies (e.g., Sales, 1969a; French, Tupper, & Mueller, 1965; Caplan and French, 1968; Friedman, Rosenman, & Carroll, 1958; Grundy and Griffin, 1969) have examined the relationship between work overload and strain. This may be considered tantamount to a measure of P-E fit, since it is the case of a person having too much work or work that is too difficult. However, it doesn't incorporate the additional possibility of underload also relating to strain, and so we shall state in summary that these differing measures of overload were found to be related to job dissatisfaction, low self esteem, and high

cholesterol levels. The latter two studies cited above give evidence that overload produces strain, since rises in cholesterol occurred just prior to or at the time of the overloading condition.

More pertinent findings resulted from a laboratory experiment by Sales (1969b). One half of the 92 student volunteers were subjected to a condition of work overload (35% more anagrams than they could solve in the allotted time); the other half were subjected to a comparable underload. The work load of each individual was adjusted to his own level of performance, so the independent variable was P-E fit with respect to work load. During the one hour task, cholesterol increased most for overloaded subjects who felt they were overloaded and next most for underloaded subjects who felt they were underloaded. However, it decreased for underloaded subjects who felt they were overloaded.

Responsibility

The responsibilities that a person has for aspects of his job can be divided into two kinds: responsibility for other people (for their careers, welfare, professional growth, etc.) and responsibility for things (for projects, budgets, equipment, etc.). The distinction between these two types of responsibility was originally suggested by Wardwell, Hyman, and Bahnson (1964) when they implied on the basis of their research that responsibility for persons was far more stressful than responsibility for things, and that it was one of the important sources of stress in coronary heart disease.

Findings regarding P-E fit with respect to responsibility are scarce. Caplan (1971) did find some evidence relating P-E fit to strain. Responsibility for things was significantly related to job

satisfaction ($p < .001$), with those having perfect fit being the most satisfied. Responsibility for persons also was related to job satisfaction ($p < .01$) and to cholesterol ($p < .10$). For these two findings, those persons with perfect fit or slightly more responsibility than they wanted, showed the highest satisfaction and lowest cholesterol levels.

Role Ambiguity

In order to perform well in an organization, one needs to know what one is expected to do and not to do. Role ambiguity is a state in which the person has inadequate information to perform his role in an organization (French and Caplan, 1972).

The findings of Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964) show that role ambiguity is accompanied by low job satisfaction. But results concerning P-E fit are again difficult to come by. For one thing, as might be expected, few people report having less ambiguity than they want. Out of 206 respondents, Caplan (1971) found only six reporting less ambiguity than they wanted. Nevertheless, P-E fit was significantly related to job satisfaction ($p < .001$), with those reporting perfect fit also reporting the highest satisfaction.

Interpersonal Relations

In this study, we have measures of the quality of relationships with one's superior, peers, and subordinates. These measures concern such aspects as confidence, trust, friendliness, and willingness to listen to problems of others. Caplan (1971), using this study's measures of fit with respect to interpersonal relations, found associations between job satisfaction and good fit on relations with superior ($p < .001$) and relations with subordinates ($p < .10$). No such

direct associations appeared with physiological strains. However, he notes that his findings show good interpersonal relations act as a buffer that may prevent the elevation of blood pressure and glucose under conditions of high quantitative work load.

The importance of good relations among organization members for improving organizational health has received much treatment in the literature (e.g., Likert, 1961, 1967; McGregor, 1960; Argyris, 1964). Research has shown that the loyalty of peers toward one another can increase their satisfaction with their work (Cartwright and Zander, 1960; Mann and Baumgartel, 1953; Mayo, 1960). Going outside the realm of the organization for the moment, a growing body of literature is implicating nonsupportive relationships as contributing factors in coronary heart disease. Rejection by a loved one (Kits van Heijningen and Treurniet, 1966), having a nonsupportive wife (Dean, 1971), and losing next of kin through their death (Parkes, Benjamin, and Fitzgerald, 1969; Rees and Lutkins, 1967) have all been shown to be antecedents of coronary heart disease. Gore (1973) has produced an excellent review of social support as it relates to a wide variety of stresses and strains.

Participation

Participation refers to the extent to which the person has influence on decision processes in the organization. To the extent that people's knowledge, opinions, or wishes are excluded from such decision processes, they have low participation (French and Caplan, 1972).

Most studies of participation have only focused on increasing it. For example Coch and French (1948), French, Israel, and Aas, (1960),

and French, Kay, and Meyer (1966) have shown increases in participation to be accompanied by higher job satisfaction and better interpersonal relationships. Findings regarding participation and satisfaction seem to hold in other cultures as well (Obradovic, French, & Rodgers, 1970; Levitan, 1970). In a field experiment, Morse & Reimer (1956) found that moving the locus of decision making downward in an organization increased satisfaction and productivity (although elsewhere in the organization, where decision-making has been moved upward, productivity increased even more, at least temporarily). Maier and his associates (Maier, 1970) have produced a long series of laboratory experiments on changing work group procedure which repeatedly demonstrate the effectiveness of participation in decision making. Other studies could be cited.

But what about the notion of P-E fit? Of the above studies, only that of French, Israel, and Aas comes close to incorporating it. In their study they found that the beneficial effects of participation held only to the extent that workers felt the participation was legitimate.

And yet there seems to be a place for P-E fit here, too. There is nothing inherently bad about being a non-participant. Common sense suggests that the final issue should be whether a person is participating as much as he wants to, whether there is a fit between the participation he is allowed and that which he desires.

Tannenbaum et al. (forthcoming) report data that tend to support this contention that one should not simply look at the actual amount of participation a person has. Studying plants in five countries, they obtained workers' reports of both "actual" and "ideal"

participativeness. They found both "actual" and "ideal" participativeness varied among the five countries, but the patterns of the variations in the discrepancies between "actual" and "ideal" are interesting. Both American and Italian plants are relatively low in actual participativeness but the discrepancies between actual and ideal differ considerably between the two countries, being small in American plants and large in Italian plants. On the other hand, American plants and those on Israeli kibbutzim differ greatly in both their actual and ideal levels of participation, and yet the discrepancies between actual and ideal in the two countries are virtually the same. So the matter seems not so simple as merely examining the amount of participation a person has.

In Caplan's study, although only three people reported having more participation than they wanted, there was still a clear and significant ($p < .001$) relationship, in the expected direction, between degree of fit and job satisfaction.

Strains as Risk Factors in Heart Disease

In this section we shall examine briefly the evidence for each of the strains in this study being a risk factor in coronary heart disease. As was the case for findings on the stresses, Caplan (1971) has thoroughly covered this area, and we shall not repeat the entire review. The reader who wishes this full coverage should refer to Caplan.

The physiological measures included in this study are systolic and diastolic blood pressure, and levels of glucose, cholesterol, and uric acid. Regarding blood pressure, Caplan notes that the mechanisms by which it may produce coronary heart disease are not

well understood. Doyle (1966) reviewed epidemiological studies of coronary heart disease and reported that coronary heart disease is three to five times more common among individuals who habitually exhibit elevated diastolic blood pressure. Caplan cites a number of such studies demonstrating this relationship between high levels of blood pressure and coronary heart disease (e.g., Chapman and Massey, 1964; Epstein 1967b; Rosenman et al., 1970; Stamler, 1964).

In the case of glucose, Epstein (1967a) reviewed several studies linking glucose to coronary heart disease. Included were findings from the Tecumseh Community Study (Epstein et al., 1965) suggesting that the risk of dying of coronary heart disease is significantly greater among persons with antecedent hyperglycemia, and corroborative findings on "casual" blood sugar from the longitudinal Framingham Community Study, showing that

Even by this relatively crude measurement, the total incidence of deaths from heart attacks during the subsequent 12 years was clearly related to blood sugar. (p. 612)

Turning to cholesterol, Caplan again cites several studies linking high cholesterol levels with coronary heart disease (e.g., Chapman and Massey, 1964; Epstein and Moore, 1968; Ward and Hook, 1962). But Caplan goes on to state

Unfortunately, while cholesterol is believed to build up in arterial plaques and obstruct arteries, the exact mechanism by which this occurs or by which cholesterol exerts other harmful effects is still unknown (Moses, 1963). (p. 75)

The linking of uric acid with heart disease is not well established. Most of the studies cited by Caplan achieve the potential link through a connection with other strains like cholesterol or

obesity, or through connections with personal characteristics like drive, achievement, and leadership (Brooks and Mueller, 1966). These latter variables are close to the conception of behavior Type A-- the hard-driving, achievement-oriented, coronary-prone individual. Caplan (1971) discusses this Type A behavior pattern at length. Other studies (e.g., Rahe, Rubin, Arthur, and Clark, 1968; Kasl, Cobb, and Brooks, 1968) have found elevation of uric acid to be associated with the onset of stressful situations.

Psychological Strains

Two types of psychological strains are included in this study: low self esteem and low job satisfaction. Caplan found that little is known about the relationship of self esteem to coronary heart disease. He did cite a few studies that seemed relevant, however. Among them, Kasl and Cobb (1970), longitudinally studying men who lost their jobs in a plant shutdown, found drops in diastolic blood pressure to be associated ($p < .01$) with increases in self esteem. Also, Kasl and French (1962) found a significant ($p < .01$) inverse relationship between self esteem and frequency of visits to medical dispensaries for reasons other than physical injuries. And Sloane, Habib, Eveson, and Payne (1961) found their student volunteer subjects with high cholesterol levels to have lower self esteem than those with low cholesterol levels. Among white collar workers, House (1972) found significant negative relationships between occupational self esteem and blood pressure.

Regarding job satisfaction, Sales and House (1971) analyzed three separate sets of data and found substantial ecological correlations between job satisfaction and heart disease. In each of

The discussion will be limited in scope, given the orientation of this study. We are, in this study, primarily concerned with individual well-being; this is not a systemic change effort. Therefore, we shall focus on interventions aimed at the individual, group, or, at most, intergroup level. Our focus might also be characterized as on the "people" approaches (Leavitt, 1965), rather than the structural or technological. Finally we shall try to limit ourselves to distinct types of interventions. This excludes, at the one end, approaches like Grid organization development (Blake & Mouton, 1969) or process consultation (Schein, 1969), which contain several types of intervention, and at the other end, what might be called "tools" (e.g., force field analysis, fishbowling) that could be "pulled out of the bag" during the course of many types of intervention. Our descriptions will be brief; books have been written on many of these interventions.

Having thus hopefully clarified the limited area of this discussion, let us go on to examine interventions and the stresses they might be expected to affect. Figure 2 presents those interventions and stresses with which we shall be concerned. The reader may note that one additional stress has been added to those listed in the model portrayed in Figure 1. This is interfacing--having work-related contacts with persons in other parts of the organization or outside the organization. It was not included in the earlier model because we do not measure interfacing stress as the discrepancy between what the individual has and what he would like; rather we simply ask the person how much stress he experiences in communicating with people in various locations (see Chapter 2). With this addition, let us begin our discussion.

these analyses, the standardized mortality ratio for each of a set of occupations was correlated with measures of mean job satisfaction for each occupation. Correlations between intrinsic satisfaction and death from heart disease were inverse and quite strong (ranging from $-.31$ to $-.84$). The comparable correlations for extrinsic satisfaction were less strong and less consistent. The results were more pronounced in white collar occupations (the population drawn from in this study). Jenkins (1971) reviews several studies showing job dissatisfaction to be more characteristic of coronary patients than of control subjects. House (1972) found significant negative relationships (for older men in upper white collar jobs) between job satisfaction and glucose, uric acid, systolic blood pressure, and an index of coronary heart disease risk that he constructed. Sales (1969a, 1969b) has also found negative correlations between satisfaction and cholesterol level.

The Experimental Manipulations in the Context of Organization Interventions

As mentioned earlier in the chapter, this experiment is based in two principles: participation and data feedback. Intervening in an organization by collecting and feeding back data and by increasing the amount of participative problem-solving are but two of many possible interventions. Bowers, Franklin, and Pecorella (1973), Hornstein, Bunker, Burke, Gindes, and Lewicki (1971), and Katz and Kahn (1966), among others, have reviewed various methods or techniques for attempting change in organizations. In this section we shall examine several types of interventions and speculate as to their effects on the job stresses measured in this study.

Direct Use of Information

Katz and Kahn (1966) discuss one of the simplest types of intervention: the provision of additional information. However, as they point out, such a technique is effective mainly as a supplement or support for other methods. For example, supervisors might be provided with information on ways to manage effectively. But for them to use such information, skill training (see below) might also be necessary. There is one area, cited by Katz and Kahn, where provision of information can have an effect. In ambiguous situations, lack of information is the key to the problem. And so we might expect this simple intervention to have an effect of decreasing role ambiguity, if it provides information that helps to clarify what an individual is expected to do.

Job Enrichment

Herzberg has probably been the most persistent advocate of job enrichment (e.g., Herzberg, 1968; Paul, Robertson, & Herzberg, 1969), although others (e.g., Kahn, 1973) have written in that context as well. The idea of job enrichment is what Herzberg called "vertical loading," or providing the worker with more challenging, growth-producing aspects in the job. This is to be distinguished from "horizontal loading," or simply requiring that the worker do more things. One can see that quantitative and qualitative work load would be most likely to be affected by an intervention of this sort. Responsibility for things might also be increased. Effects on other stresses are more uncertain. Herzberg (1968) indicates that, at least in terms of designing the enriched job, the worker should not participate. On the other hand, Lawler, Hackman, and Kaufman (1973), in a field

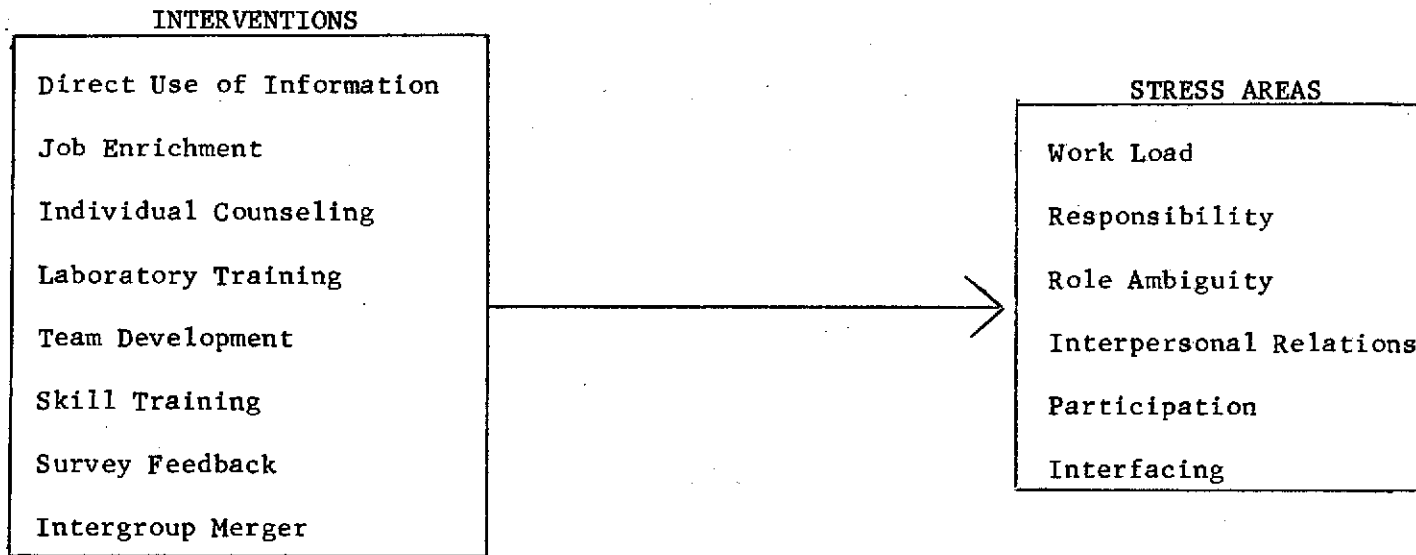


Figure 2. Some organization interventions and job stresses that they may affect

experiment on job enrichment, found a negative impact on interpersonal relationships. They suggested that the negative impact was due to the lack of participation on the part of those affected by the job redesign.

Individual Counseling or Therapy

The utility of this intervention, aimed strictly at the individual, is subject to much debate. Katz and Kahn (1966) raise doubts about a person's ability to maintain any changes, achieved outside, in the everyday organization setting. They further question whether such changes would have any effect on the organization. On the other hand, Tannenbaum (1971) argues strongly for the importance of individual change. Assuming for the moment that a change in the person's social sensitivity or behavioral flexibility (Tannenbaum's focal points) could be maintained, such changes could have beneficial effects in a number of stress areas. Interpersonal relations areas would seem to be the ones most subject to benefit. In the case of a supervisor, a lessened need to control others might also result in increased participation for his subordinates. Tolerance for ambiguity might also be increased, leading to less stress in the area of role ambiguity.

Laboratory Training

Perhaps more has been written of this intervention than any other. Two of the best-known works in this area are Bradford, Gibb, and Benne (1964) and Schein and Bennis (1965). It should be emphasized that, as an organization intervention, laboratory training is not synonymous with a T-group. Argyris (1964a) lists several other components of laboratory education in addition to the T-group: diagnosing of organization problems, consultation groups, lectures, role playing.

of "real" situations, developing and testing of recommendations, and working on intergroup problems. Strictly speaking, that takes the method outside the limits of this discussion, but we shall continue, exploring mainly the T-group aspects.

The central feature of laboratory training is that it is experience-based learning. But two primary controversies surround the method. One is the extent to which changes actually occur in those who have taken part, and the other is the extent to which any changes (new behaviors, outlooks) are transferable to the job setting. Dunnette and Campbell (1970), for example, have reviewed much of the literature on laboratory training and find very limited evidence of change, especially by "objective" measures. Regarding the transfer problem, Bass (1967) suggests eight approaches to increasing the transferability of learnings into the job setting. Many of these involve using "real life" organization problems as the content of the learning situation, rather like phasing into a team development effort (see below). Bowers (1970) goes a step further, advocating team development in place of T-group based learning to increase task-relevant behavior; i.e., trading intensity for transferability. Kuriloff and Atkins (1966) cite anecdotal evidence of success in using a T-group for a work team, but in doing so they recommend heavy emphasis on job-related content.

What effects on stresses might be expected from laboratory training? Areas of interpersonal relations seem most likely to be influenced, and in a positive manner, one would hope. But this is not a certainty. A study by Zand, Steele, and Zalkind (1969) suggests that a laboratory experience may, at least initially, alter the standards of

the participant. In such a case, members see their interpersonal relations as being worse than before, or come to want them to be even better than they did before. In either case, the immediate result would be an increase in stress regarding interpersonal relations.

Team Development

A discussion of laboratory training leads us naturally into team development as an intervention. The general agenda for team development is "being a more effective team" (Davis, 1970). Prior to the effort, each member of the team is usually interviewed about his ideas or concerns about the group. Then there is a two- or three-day series of meetings to confront the issues raised. According to Hornstein et al. (1971), the meetings ordinarily are concerned with changes in persons' authority and responsibility and a different allocation of work functions. Sessions concerning interpersonal relations may also be included. Bowers et al. (1973) add that clarification of roles may be a focus of the effort.

Given this description of team development, it seems that such an intervention would potentially affect most all the stresses measured in this study. It appears to be worthy of consideration as a means to improve P-E fit, although its orientation is more toward group effectiveness than individual well-being.

Skill Training

Skill training is just what the name implies: acquiring and practicing behaviors that enable one to perform in ways more beneficial to himself and/or the organization. One variety of skill training involves improving abilities to perform everyday job tasks. This kind of training would be directly relevant to reducing stresses of

quantitative or qualitative work load; i.e., the worker would be better able to take on more work or work that is more difficult. With additional or improved skills he also might prefer to take on work of increased amount or difficulty.

But of more central relevance here is skill training in problem-solving. Bowers et al. (1973) give a good description of this approach.

Training in this process involves briefly learning about an ordered series of stages and extensively practicing them with the aid of experts who provide feedback on the adequacy of behavior. The stages include (1) orientation and problem definition, (2) identification of possible solutions, (3) evaluation of possible solutions, (4) solution selection and decision, (5) building implementation action steps, (6) evaluation of change and subsequent review process, and (7) overall evaluation of the problem solving period. Specific skills of central importance to this process include (a) "brainstorming" (i.e., rapidly suggesting alternatives without evaluating them), (b) "posting" (i.e., listing ideas publicly in a concise form), and (c) "processing" (i.e., evaluating sessions to identify strengths and weaknesses. (p. 47)

The important impact of problem-solving skill training is obvious: effective problem-solving skills can be useful in trying to reduce stresses in any of the areas with which we are concerned. Given our model of stress as the mis-fit between the needs or abilities of the person and the supplies or demands of the job, any such mis-fit can be considered a problem subject to attempts at problem-solving. And so utilization of problem-solving skills offers the potential for reducing any of the stresses of concern to us.

The effectiveness of group problem-solving has been well-documented. Studies on participation cited earlier, especially the long series of studies by N. R. F. Maier and his colleagues (Maier, 1970), are

pertinent. As Barnlund (1959) found, group decisions, reached through cooperative deliberation, are significantly superior to decisions made by individuals working alone and to majority rule.

Survey Feedback

Survey feedback was developed by F. C. Mann and others (see, e.g., Mann, 1957). It involves the systematic collection of data on aspects of the work situation, followed by group discussion of those data. According to Katz and Kahn (1966), the discussion should take place in a task-oriented atmosphere and include analysis of problems represented in the data, identification of possible causes of the problems, and agreement on solutions. The reader can find a rather extensive rationale for this approach in Miles et al. (1971).

As was the case for skill training in problem-solving, the applicability of this type of intervention to a study like the one reported herein is obvious. Data can be systematically collected about the very stresses with which we are concerned, and those data fed back to work groups to use as a starting point for identifying and solving problems. So the primary aim of this study (to reduce job stresses) could be achieved well by a merging of these two approaches: feedback of survey data on job stresses, followed by effective group problem-solving regarding particular stresses highlighted by the data. And the possibility of impact on all the stress areas is present.

Two qualifications should be added to a discussion of feedback, as it pertains to this study. First, data can be gathered by means other than a questionnaire survey. Interviewing is the primary other possibility (see, e.g., Beckhard & Lake, 1971). Second, in contrast to this study, data collection and feedback is more often system-wide,

and the subsequent program of meetings often proceeds in a "top-down" manner. At any rate, the basis of the method is feedback; i.e., the data gathered are provided for use in solving problems and attempting improvement.

Intergroup (Merger) Interventions

This means of dealing with intergroup problems was developed by Blake and his colleagues (e.g., Blake, Shepard, & Mouton, 1964; Blake, Mouton, & Sloma, 1965). It may be used with two or more groups. An intervention of this type typically involves having each group separately generate a list of terms they think describes themselves as a group, a list they think describes the other group, and finally a list of terms they believe the other group is saying about them. After this, the groups come together to share their perceptions and predictions. According to Hornstein et al. (1971), this communication accomplishes two things: "(1) Distorted and stereotyped perceptions, misunderstandings, and misconceptions between the two groups are identified and examined; and (2) issue and problem areas are listed and ranked according to importance." (p. 356) After this listing and ranking, task groups (with members from each original group) are formed and work to find solutions to the problems and plan action steps to implement the solutions.

This intervention obviously is most applicable to reducing interfacing stresses. And it is perhaps the most powerful of those we have reviewed for dealing with that particular stress area, since "both sides of the problem" are represented in efforts at solution. It might also have some beneficial effects on work load or ambiguity, to the extent that such stresses are connected with interfacing

problems. However, the possibility for effects on other stresses seems minimal.

In Summary

In order to set the experimental manipulations of this study in a context, we have reviewed several types of organization interventions and speculated as to the job stresses they might potentially alleviate. This way of examining the interventions goes outside the bounds of much that has been written about them, since most are usually viewed as attempts to improve organizational effectiveness, rather than attempts to improve individuals' well-being (i.e., reduce job stresses).

We find that the interventions planned for this study (data feedback and participative group problem-solving) seem to offer the widest potential for affecting the job stresses of concern in this study. An additional intervention worth considering is team development. As described in the literature, it could have an effect on a wide range of the stresses. One possible drawback, as cited earlier, is its emphasis on team effectiveness, rather than individual well-being.

Hypotheses to be Tested

This study explores the feasibility of a program to alter job stresses and associated risk factors in heart disease. Given its experimental nature, we have two general areas of results we wish to explore, rather than a set of specific hypotheses. The primary area that will be explored is the effect of the program on job stresses reported by the participants and on the strains they experience. The second area concerns the direction of causality in the stress-strain relationship. Although a few experiments (e.g., Sales, 1969b)

have demonstrated a causal relation between certain stresses and strains, we wish to examine the validity of the general assumption that stress causes strain.

CHAPTER 2

METHODS

Research Design

The basic design of this study was a field experiment (French, 1953) with experimental and control groups. In the experimental groups, efforts were made through an intervention to improve person-environment (P-E) fit with respect to several job stresses (listed in Table 1); in the control groups, no attempts were made to influence these variables. The study was conducted at Goddard Space Flight Center, where stresses were judged to be high enough to warrant an intervention, and the Health Unit staff was sympathetic to the research and capable of providing good medical data.

In order to measure the effects of the intervention on P-E fit, questionnaires were administered to the experimental and control groups at three points in time--just prior to the intervention, immediately after the intervention, and again three months after the completion of the intervention. These questionnaires contained measures of all the stresses, as well as the psychological strains under investigation (see again Table 1). These measures are described later in the sections, Measures of Stress and Measures of Strain.

Measures of physiological strains also were collected at the same three points in time. These measures were taken by means of

physical examinations and blood tests conducted by the Goddard Health Unit staff. These measures are described below in Measures of Strain.

The measures of stress and strain served, then, as the data to investigate the aims of the experiment: to establish to what degree the stresses were causes of the strains, and to study the effects of an intervention on improving P-E fit and reducing strains.

In an effort to document the intervention, observers were present at each intervention program meeting of the experimental groups to take notes on the course of the meetings. Also, at the end of each meeting participants in the experimental groups filled out post-meeting ratings. These efforts at documentation are described later in the section entitled Documentation of the Intervention Program, and the general content and reasoning behind the planned intervention is described in the section entitled The Experimental Intervention.

Participants in the experimental and control groups were members of white-collar work groups in the lower levels of the Goddard hierarchy. This level of the organization was chosen because the sample would be similar to that in earlier studies at Goddard upon which this experiment was based (e.g., Caplan, 1971). Five experimental¹ and five control work groups were selected and recruited in the following way: Medical records were screened to identify areas of the

¹Shortly after the intervention program began, one experimental work group was split in a re-organization. The two resulting groups pursued the program separately, and are identified as two separate groups throughout this report.

organization where strains seemed sufficiently high to consider including work groups in the study. Upper-level managers in these areas were contacted, the study explained to them, and permission was sought to talk with managers below them. This procedure was followed down the hierarchy until the level of the target work groups was reached. At this point, cooperation of the work group members was sought on the basis of informed consent; i.e., the background and general plan of the study was explained to the potential participants, and they were asked to volunteer their participation.

Among the work groups recruited for the study, group size varied from four to 12. There generally was only one level of supervision in each group, although a few participating groups included two levels of supervision. The organizational responsibilities of the groups were varied: operations planning, optical testing, procurement, contract management, structural research, cost and price analysis, transportation, physical plant engineering, construction management, and production, distribution, and archiving of documents.

Although no attempt was made to match each experimental work group with a control work group, it was hoped that due to the initial screening process, characteristics of the experimental sample as a whole would not differ significantly from those of the control sample. Table 1 indicates that the two samples were adequately matched.

The Experimental Intervention

In this section the general strategy and content of the intervention program will be presented, along with the principles upon which it was based. It is fair to say that the program was not carried

out exactly as planned, nor were the programs of the six experimental work groups identical to one another (see below). The reader will find a specific and expanded account of the program, as it was developed and implemented in each group, in Chapters 3, 4, and 5.

The two central principles upon which the program was based were the principle of participation (relevant findings have been summarized in Chapter 1) and the principle of data feedback (e.g., Mann, 1957, 1968). Members of each experimental work group were convened in a series of ten weekly meetings, to identify and solve, in a participative manner, problems that the members felt were stressful in their work setting. The basic objective of each meeting, from our research standpoint, was to have the participants devise ways to improve P-E fit with respect to the stresses already mentioned. Of particular importance were P-E fit with respect to participation and interpersonal relations, given the findings on participation previously summarized and the findings of Caplan (1971) that good interpersonal relations may buffer the relationships between other stresses and strains. A simultaneous objective was to maintain or increase the productivity of the groups.²

In order to maximize the practical benefits of the program for each group (though at some loss to the rigor of the research), each group was allowed to direct the course of its own program; i.e., to select for attention those problems it felt were most stressful in its

²Efforts were made to assess the productivity of each group through group productivity ratings made by managers directly above each group. However, correlations between two ways of measuring change in productivity (the difference between a manager's group productivity rating at, say, Time 1 and Time 2, and his subjective rating of that group's change in productivity between Time 1 and Time 2) ranged from -.05 to .31. Given this poor evidence for convergent validity, no productivity ratings are included in this report.

Table 1

Characteristics of the Experimental and Control Groups at Time 1

<u>Personal Characteristics</u>	Exp.	Control	F	sig.
	(N=54)	(N=44)		
	Means			
Age	41.5	43.3	.98	ns
Height	70.0	70.0	.67	ns
Weight	171.7	173.9	.23	ns
<u>Stresses (P-E fit)</u>				
Quantitative Work Load	4.40	4.60	5.33	p<.05
Qualitative Work Load	4.54	4.62	.54	ns
Responsibility for Persons	4.12	4.31	1.55	ns
Responsibility for Things	4.41	4.36	.16	ns
Role Ambiguity	4.23	4.28	.14	ns
Peer Relations	4.46	4.15	7.70	p<.01
Superior Relations	4.34	4.29	.12	ns
Participation	3.99	4.19	1.60	ns
Subordinate Relations ¹	4.60	4.35	2.86	ns
<u>Strains</u>				
Self Esteem	6.53	6.67	.37	ns
Job Satisfaction ²	2.49	2.32	1.30	ns
Systolic Blood Pressure	124.2	120.8	1.71	ns
Diastolic Blood Pressure	78.3	79.1	.19	ns
Glucose ³	104.0	99.7	.42	ns
Cholesterol	233.2	224.3	2.12	ns
Uric Acid	5.89	5.97	.15	ns

¹The numbers in the sample for this variable are 25 (experimental groups) and 12 (control groups).

²This is the content-free measure.

³Two-hour post-prandial measure.

own work environment, and thus the particular stress areas to be addressed directly. So while the process of the program in each group was roughly comparable, the content (stress areas) actually treated during the program was not.

To improve fit by problem-solving in these sessions, it was felt necessary that the groups have fairly precise knowledge of the stress variables for all group members. This is where the feedback of research data was utilized. The Time 1 questionnaires provided for each group the initial measures of P-E fit on all the stresses for every member of the group. These data were made available to all members in the first program meeting of each group. Two feedback forms were used--one presenting group-level data and the other presenting individual-level data. Examples of the forms may be found in Appendix A. These data were to be the bases or "springboard" for the groups' identifying and then solving stressful problems.

To help guide each group in its program efforts, a resource person, called the Training Associate (TA), was present in each meeting to work with the supervisor in leading the session. Other human resources available in the program were the group's observer, a professional consultant, and the writer. More is said of these roles in Chapter 3, where the development of the program is traced in some detail.

Having set forth the general strategy and reasoning behind the intervention as planned, let us look briefly at the basic content of the program. Two meetings were held prior to the start of the actual program. In the first of these, the TA and the observer

of each experimental group met with that group's supervisor. The general background and plan for the program was reviewed and plans made for the second of the two meetings, the group's pre-program session. In this meeting, the same review was held for all members, and the Time 1 questionnaire also was administered.

At the first of the ten program meetings, data feedback forms were given to the participants (see above). The participants reviewed the data individually, then broke into small groups to discuss and decide what stress areas they felt were most important to the group. These small groups then reported to the total group, and a decision was made on what stress area to examine first. The agenda for the first session is presented in Appendix B.

At the second meeting, then, and in subsequent meetings, each group set out to identify and solve the particular problems contained within the stress areas it had identified as important. Three work groups chose to examine role ambiguity as the first stress area, and the general course of that examination will be described here. This and other examples of agendas are contained in Appendix B, and Chapter 4 presents an account of all the program meetings of each experimental group.

In examining role ambiguity, group members paired up and interviewed each other for 15-20 minutes about ambiguities in their jobs, recording answers on newsprint to the following issues: 1) What do you feel you should be doing to accomplish your job? 2) What expectations do others have of what you should be doing? 3) List any areas of confusion or ambiguity you have about what you should be doing. 4) List any areas of confusion or ambiguity you have about

what other members of the group should be doing. The answers on newsprint then were posted for all to review. The group identified those areas of role ambiguity most common to its members, discussed what could be done in those areas (solutions), and generated action steps necessary to alleviate the role ambiguity (implement the solutions).

As can be seen in the above format, the processes used by the groups in working on their problems varied from one-to-one interviewing to small group discussions to discussions by the total group. At one point, one group even appointed "coordinators" whose job it was to gather inputs from group members, between meetings, and present these inputs as reports at the next meeting.

Some problems were explored with the involvement of persons outside the group. For example, one group met with the next-level manager to discuss performance evaluations. Another group invited a representative from Personnel to discuss with them their concerns about a possible RIF (reduction in force).

This concludes the overview of the intervention program. We shall turn now to the measures used in the study.

Measures of Stress

All measures of stress in this study were taken from Caplan (1971), an earlier study at Goddard that layed the final groundwork for this current study.³ We shall review Caplan's criteria for constructing

³One stress measure, responsibility for persons, was later expanded by Vickers (1973) in a related study. We used this expanded measure. Caplan's criteria (see below) also were applied to this expanded measure by Vickers.

these final measures, based on subjective environmental stresses, and then explain the computation of the P-E fit scores for these stress areas.⁴ Each stress measure, and its component items, may be found in Appendix C.

The following stress measures, constructed by Caplan, were included in this study's questionnaire:

- a. quantitative work load
- b. qualitative work load
- c. responsibility for persons
- d. responsibility for things
- e. role ambiguity
- f. supportive relations from superior, peers, and subordinates
(three measures)
- g. participation

The construction of these measures was based on reports by Caplan's respondents of how they perceived their job environments. A pool of items either from existing indices or constructed by Caplan and John R. P. French, Jr. was incorporated in Caplan's questionnaire. Next, to construct indices of mutually exclusive item sets with adequate internal reliability, the following criteria (Sales, 1969) were applied:

- (a) All items within an index had to correlate at a significance level of $p \leq .05$ (one-tailed).

⁴The reader may recall that one stress area--interfacing--was not measured as P-E fit. This measure will be described separately.

- (b) At least 25% of the inter-item correlations had to exceed $p \leq .01$ (one-tailed).
- (c) If an item satisfied the above criteria for more than one cluster, it was placed in the index in which it showed the highest inter-item correlations.
- (d) The above criteria had to hold up in a replication of the procedure on half the sample. Thus, the Caplan sample was first split randomly in half, then intercorrelation matrices were constructed for each set of items, and the procedure was repeated on the remaining half of the sample.

These clusters of items were the indices of environmental stress upon which the P-E fit measures of this study were based.

The essential notion in this study is that it is the lack of fit between the wants or abilities of the person and the corresponding supplies or demands in the job environment that constitute basic sources of stress and resultant strain for individuals. This way of examining causes of strain has been presented by a number of writers (e.g., French, Rogers & Cobb, in press), and goes beyond a more simple notion that one must merely provide more of some job aspect to all organization members, or less of it.

In order to minimize variance attributable to method and to insure conceptual comparability, it is often wise to present measures of the person and measures of the environment in comparable terms. So one could ask a person how much time he or she spent in meetings, as a measure of the environment, and also how much time he or she would like to spend, as a measure of the person. These two responses then could be compared to assess the degree of fit. This was the

format used in this study to determine P-E fit with respect to the various stresses.

In the questionnaire, participants were asked to indicate the extent to which some aspect was present in their job and the extent to which they would like it to be present. This was done for each stress area listed above. A typical pair of items follows.

CHECK ONE BOX IN EACH LINE:	Very Little (1)	Little (2)	Some (3)	Great (4)	Very Great (5)
A. The quantity of work you are expected to do.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. The quantity you would prefer expected.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

"A" constituted a measure of the environment and "B" a measure of the person with regard to each item. The difference between the two indicated the P-E fit for the item.

The actual P-E fit scores used in analyses were constructed in the following way. The absolute difference between "A" and "B" was taken, and this figure was subtracted from a constant of 5. This formula $(5 - |E - P|)$ was applied to each item, and then the mean of all item scores for each index was computed. As the reader can ascertain with a bit of calculation, scores could range from 1.0 (the worst possible fit) to 5.0 (perfect fit). This mean constituted the P-E fit score for each stress area.

It can be noted that these scores do not take into account the direction of mis-fit. Scores were computed in this absolute rather than directional manner because it was the basic goal of this experiment to attempt to improve P-E fit, whichever the direction of mis-fit.

And so in the analyses, we shall be interested in determining whether people moved toward perfect fit, from whichever direction.

One additional stress area was assessed in a manner different from the above. This stress was called interfacing--having work contact with others outside one's work group. Participants were asked to indicate, in a series of items, the amount of time they spent communicating with persons in different locations, both in other parts of the organization and outside the organization, and also the amount of stress they experienced in communicating with each type of person. These items were retained separately rather than combined as an index. These measures of interfacing stress also may be found in Appendix C.

Measures of Strain

Physiological Strains

As has been mentioned earlier, the physiological strains included in this study were systolic and diastolic blood pressure, and measures of glucose, cholesterol, and uric acid in the plasma.⁵ The procedures for collecting these data will now be described.

Participants in the study were instructed to fast after midnight on the day of their physical examinations. At 6 a.m. they were to drink 10 ounces of Trutol, a standard glucose solution. Upon arriving at work (approximately 8 a.m.), they reported to the Health Unit where a blood sample was drawn. These samples were collected in an anti-coagulant. The samples were chilled and centrifuged to separate

⁵Heart rate data also were to have been included. However, the number of participants for whom we received heart rate data was severely depleted, and early analyses showed no significant results, so heart rate data are not included here.

we shall review the construction of each. The reader who wishes a more exhaustive account of the measures is referred to the original House volume.

Content-specific job satisfaction. These two measures of satisfaction (extrinsic and intrinsic) were constructed by House by means of a factor analysis of several indices of satisfactions. On the basis of the factor loadings of each index, two measures--extrinsic and intrinsic--emerged. The extrinsic measure pertains primarily to opportunities for money, prestige, and esteem, while the intrinsic measure pertains primarily to opportunities for self-development, self-utilization, and value-expression.

In these measures, participants rated items on a scale from 1 to 5. The mean of all items was then taken, with 5.0 representing the highest possible degree of satisfaction. A list of all items in these two measures is contained in Appendix D.

Content-free (global) job satisfaction. This measure contained three items. The items ascertained whether the respondent would choose the same kind of work if given a chance to start over again, how satisfied he was with his present job (all things considered), and how he thought his job compared with the jobs of most other people. Items were rated on a scale from 1 (most satisfied) to 5 (least satisfied), and a mean score was computed. Response alternatives differed for each item (see Appendix D).

Job-related self esteem. In this measure, the respondent rated how he saw himself "in his work" on nine-point semantic differential scales anchored by polar adjectives or phrases such as Sad-Happy, Important-Not important, and Successful-Not successful. There were

six items in all, and a mean was taken to form an index. Scores could range from 1.0 (most negative) to 9.0 (most positive). As presented, the positive and negative ends of the scale were reversed for some items (see Appendix D).

Documentation of the Intervention Program

Our attempts at documenting the program for each experimental group sprang from two major concerns. First, we wished to assess the degree to which our intended experimental manipulation (a series of data-based, problem solving meetings to improve P-E fit) actually was carried out. Second, should the experiment prove feasible, we wished to have it well-documented to help in applying it in other organizations. We employed two means for doing this. First, observers were present in each of the program meetings, taking notes to provide a running account of the sessions. They were given a guide for observation of a group, a list of leader functions, and guidelines for their running accounts. Their guidelines included identifying the major goals, accomplishments, and important incidents of the meeting, as well as describing the behavior of the leaders. A sample of these materials is provided in Appendix E. Although portions of several staff meetings were spent in explaining and discussing with the observers the concepts and requirements of the observations, no other training was given the observers. As the reader will see in Chapter 4, in practice these observations did not work so well as we had hoped.

Second, in order to provide some graphic representation of the course of the program in three important areas (satisfaction, supportive relations, and participation), work group members filled out brief

post-meeting ratings (PMRs) on these variables at the end of every program meeting. They indicated the extent to which they were satisfied with the meeting and had felt support from others in the meeting, and the extent to which they had participated in the meeting and had wanted to participate (four questions in all). On these forms also were recorded each person's blood pressure (taken by the TAs) and pulse (taken by the participants themselves). Graphs of these PMR data are included at the end of Chapter 4, and the form itself may be found in Appendix E.

The Analyses

Given the nature of the design, analysis of covariance was the primary procedure used to test the effects of the program (Campbell & Stanley, 1963). The analysis of covariance adjusts treatment means to take into account differences in the covariate(s); e.g., differences in job satisfaction at Time 1 when testing for differences in job satisfaction at Time 2 (Snedecor & Cochran, 1967). Other procedures used included analysis of variance, correlation, and paired t-tests (for related measures). Where special procedures are used, they will be explained in the results sections.

CHAPTER 3

PLANNING AND IMPLEMENTING THE EXPERIMENT

This chapter traces in a general manner the planning and implementation of the feasibility experiment. It is discussed in three sections or "phases." The first section covers the period from the first meetings held in preparation for the experiment up to the time when efforts began in earnest to orient and train the staff who were to carry out the program, and a program consultant was brought into the picture. This time period covered about six weeks and included discussions about, and actions regarding, many activities related to the experiment. Among these activities were initial contacts with Goddard staff, considerations and decisions about personnel to staff the program, identification of appropriate "target" groups to be included in the experiment, initial efforts aimed toward recruiting groups, and continuing refinement of both the program content and the roles to be played by program staff.

The next section describes the final planning activities from mid-December, 1971 to mid-February, 1972. These activities culminated in the first intervention program meeting on February 11, 1972.

In the final section we shall describe briefly the ongoing planning and monitoring activities that took place concurrent to the program's implementation. In addition, the few activities, mainly data gathering, that took place after the program's conclusion will be

mentioned. Figure 3 charts the major activities and events described below. A rather extensive description and interpretation of the program activities for each experimental group will be presented in the two chapters following this one.

Phase I: Early Planning Activities

Discussion in earnest about the upcoming experiment began with a meeting in Ann Arbor on September 27, 1971. Among those present were Dr. French (principal investigator for the proposed research), Dr. Louis Arnoldi from NASA Headquarters, and the writer. The content of the meeting included both a review of recent research findings relevant to the experiment and a discussion of the applications of these findings in planning the experiment. It was decided that Goddard Space Flight Center would be an appropriate site at which to conduct the experiment, since the job stresses there were sufficiently strong to warrant an intervention and the Health Unit was sympathetic to further research and could supply good research data on physiological strains. We also learned that a psychiatrist, whose main interest was preventive psychiatry, recently had joined the Health Unit staff on a one day per week basis. It was suggested that he be included in our further discussions preparatory to carrying out the experimental program. We learned also that Goddard recently had undergone a RIF (reduction in force), including some job reassignments and reductions in grade (salary), and that another RIF might be required in the following months. And so we were alerted for the first time that those potential participants in this experiment on job stress might have an additional concern, the RIF, which indeed turned out to be true.

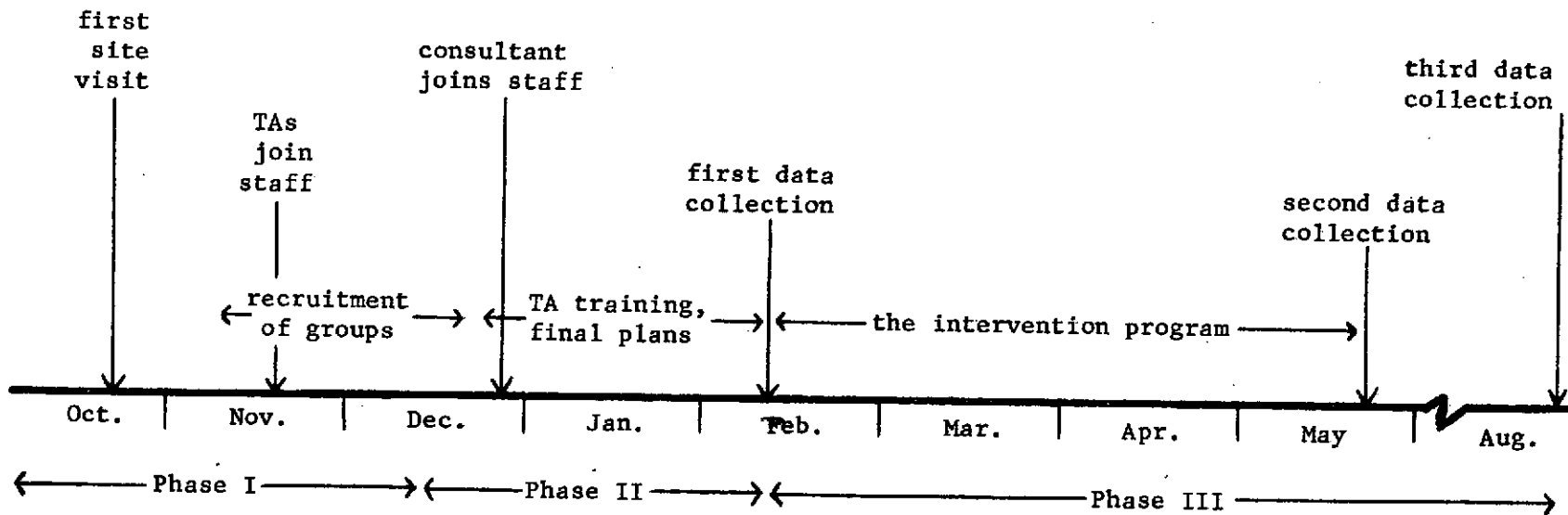


Figure 3. A chronology of the experiment

On October 21, we traveled to Goddard for the first on-site meeting regarding the experiment. Those present included Dr. French, Dr. Arnoldi, Ms. Jean Mockbee (a biostatistician from NASA Headquarters), Dr. Carlos Villafana (director of the Health Unit), Dr. Frank Edmiston (the newly-arrived psychiatrist), and the writer. The proposal to conduct the experiment and the findings upon which it was based were reviewed for those who had not seen the proposal or the memo recounting the meeting of September 27. Many aspects of preparing for the experiment were discussed. Among these were the kinds of measurements we would need, the process for identifying and selecting work groups to participate, and the criteria for selection of groups. It was agreed to seek five experimental groups and to have a general program format of one meeting per group per week for ten weeks. It further was agreed to aim for a late-January beginning for the program, since many personnel took holiday vacations during the time just prior to that (mid-December to mid-January). Dr. Villafana was to investigate the possibility of securing internal personnel to assist in the program and also to begin conferring with higher management about groups that might be appropriate for the experiment (from the "stress" side). From the "strain" side, Ms. Mockbee was to check the medical records to identify groups in which physiological strains seemed sufficiently high to warrant including the groups in the experiment.

Three weeks passed before the next meeting at Goddard. During this time a set of potential participating groups was identified and narrowed down. A "top-down" procedure for recruiting these groups was decided upon: Superiors of the target work groups would be contacted sequentially, starting with management at the highest level.

The study would be explained to each of these persons, in turn, and permission sought to talk with the next-lower manager. When the hierarchical level of the target work group had been reached, all members of the target group would be convened and the study explained to them. If all members of the group agreed to participate, the group would be accepted. Alternatively, if any member(s) did not wish to participate, a judgment would be made as to whether the remaining members could still participate as a meaningful "unit." If so, the group still would be accepted; if not, it would be rejected.

It was also during this time that we learned of some Goddard employees who might be utilized to staff the program. They were characterized to us as "five bright young people" who might be interested in becoming involved with the program. And so we began thinking of how we might utilize these "new faces," since the roles to be played by various program staff had not been clearly identified yet at this time. We knew we were going to have five groups to lead through a ten-week program. Possible leaders for this task were Dr. French, Dr. Edmiston, and the writer. Budget constraints and other work commitments were acting to limit possibilities for Dr. French and the writer to take on such a role. Dr. Edmiston's role also was unclear for two reasons. His total time allotment at Goddard was only one day a week, and his interests and approach to this area of intervention were somewhat different from ours, making our working relationship rather tenuous. This last problem was to become crystalized a bit later. We therefore began to entertain the possibility of a major active role for these five new people. This seemed both practical in

terms of other resources available (or not available), and useful to Goddard in terms of building some internal resources to carry out such efforts, should they continue in the future.

During the next site visit (November 11), the question of staff roles in the program was discussed further. Dr. Edmiston also raised some of his concerns about our approach to the experiment. In addition, the first meeting was held with a manager to begin the recruitment process discussed above. This process was to continue for the next several weeks. Dr. French took primary responsibility for the recruiting; the writer was present at this but few other such meetings.

In the following week, the agenda for a work group recruiting meeting was drawn up, since we were nearing that stage. We also clarified the variety of roles to be taken by program staff, in preparation for our first encounter with the five young Goddard employees who were to assist with the program.

At Goddard on November 18, we first met with Dr. Villafana to discuss the various physiological measurements that would be collected as data in the experiment. We also further discussed with Dr. Edmiston some of his concerns in the program. At this point it was generally agreed that, if the five new people were interested, they would have an active role in the program meetings. They would be "co-leaders" (with the supervisor) in a group's program meetings. Other program staff would consult weekly with these people during the course of the program.

In the afternoon, we met with these five people. Dr. French spoke at length about the background and purposes of the experiment, since they had been informed only vaguely about it. A discussion of

their own educational backgrounds revealed that two were pursuing graduate work in the general area of organization studies; the other three had, at most, some undergraduate exposure to psychology or sociology. All were young and had been at Goddard only a few years. But all expressed interest in the project, and so they joined the team.

While the writer returned to Ann Arbor, Dr. French remained to continue the recruitment process for the experiment. Upon his return, we discussed at great length the orientation and training that must be provided the five new people, and what part they should have in shaping the direction of the program. These issues ranged from simply what title they should have (we settled on Training Associate or "TA"), to orienting them with regard to the questionnaire we would use and its contents, to training them to analyze initial data for feedback to the experimental groups and to lead the group meetings. We clarified the time commitment they would need to make and the writer constructed an initial outline of what activities the ten-week program might contain. An extensive agenda was drawn up for a series of meetings with the TAs on December 9 and 10. The agenda included orientation, some training, and refining the contents of the program. The stage was set to begin intensive efforts to construct the program as it would finally be implemented and to build the team responsible for its implementation.

Phase II: Final Planning Activities

On December 9 and 10, the writer met with the TAs to begin actively involving them in developing the program plans. In the first meeting, we discussed various program-related activities to which they

would need to commit time and proposed pre-program training they would be given. A tentative design of the program, meeting by meeting, and the rationale behind the design, was presented for their consideration. We discussed what role they saw themselves playing in the program, and how that role might be molded to fit the needs of the particular work group with which they would be associated. The various proposed methods of data collection were reviewed. This included examining the questionnaire from the previous Goddard study (Caplan, 1971) and discussing possible formats and uses of both PMR forms and observations. They also were asked to fill out short (4-item) "questionnaires," which would generate some P-E fit data for them to examine in the next meeting.

The following day another meeting was held with the TAs. Results of the data gathered in the previous meeting were fed back and discussed to give them an initial experience in using P-E fit data, the type of data that would be fed back to the experimental groups. Since group problem-solving also was to be a key aspect of the program, six phases of problem-solving were presented to them, and they were asked to role play a group problem-solving situation--the "new truck problem" (Maier, 1965). Following the role play, they critiqued their problem-solving process in terms of the phases that had been presented. Finally, to give them an experience in (non-verbal) group cooperation, they participated in the "cooperative squares" exercise (see, for example, Pfeiffer & Jones, 1969).

At about this time in the sequence of events, a new staff member entered the picture. It was learned that additional funding might become available, and so Dr. Charles Seashore, a Washington-area

consultant who had considerable experience in working with groups and organizations, was hired to assist in developing and directing the program. This was a key event in the history of the experiment, for without Dr. Seashore, the program would have been almost fatally lacking in "human resources." By now Dr. Edmiston, for all intents and purposes, had stepped out of the picture due to the divergence of his preferred approaches from those of other program staff. And the remoteness and relative inaccessibility of Dr. French and the writer, being based in Ann Arbor, made it imperative that an experienced consultant be available nearby as the program developed.

In the next weeks, Dr. Seashore quickly became prominent in planning activities. In the last week of December, through the combined efforts of Dr. Seashore, Dr. French, the TAs, and the writer, intensive efforts at planning and shaping the program took place. Role components of the "leader team" (i.e., supervisor, TA, observer) were specified. A general calendar of events for the program was drawn up. These events included, prior to the actual program meetings, physical examinations for the participants, "leader team" meetings, and a pre-program orientation and questionnaire-administration for each group. The agendas for those two pre-program meetings were established, as was the agenda for the first program meeting. A general model for subsequent program meetings was drawn up. Final decisions were made regarding what items would be included in the questionnaire. The TAs role-played their initial contacts with the groups' supervisors (the "leader team" meetings).

The hectic planning and preparation continued into the first weeks of January. Final decisions were made about the format of the

PMRs, the guidelines for observing the groups, and the data feedback forms. The questionnaires were prepared for distribution at the pre-program meetings, and instructions were drawn up for the TAs to compute the P-E fit data from the questionnaires for feedback to the groups. The TAs' responsibilities in these areas--data computation, pre-program meetings, group observation--were reviewed for them. The TAs began contacting work group supervisors to arrange for the pre-program meetings.

The week of January 24 was set for "leader team" meetings and the following week for group orientation and questionnaire administration (ending February 4). The TAs then had to compute the P-E fit data and prepare the feedback forms (described in Chapter 2) for the first meeting, scheduled for February 11. Each participant was to receive the P-E fit data for every individual in his group, identified by name, to use as a basis for problem-solving to improve individuals' P-E fit with respect to the various stress areas.

On February 9, just prior to the first program meeting, Dr. Seashore and the writer met with the experimental groups' supervisors to review the program plans. When the procedure for individually-identified data feedback was reviewed, they expressed shock and surprise. Almost to a man, they declared that they had been unaware that the data would be fed back in that manner (although Dr. French, who recruited the groups, reported that that aspect was covered in the recruiting sessions), and they were hesitant if not unwilling to commit their subordinates to that format. Because of this, a decision was made to abandon fully-identified feedback. All forms still would be fed back, but identified only by a code number. Each participant

would be told his own code number, but no one else's. An additional feedback form also was drawn up. This form presented the data on a group, rather than an individual, basis. This incident likely had great significance as an indicator of how the program was perceived and accepted, since, as it turned out, few of the groups ever reached a point of revealing the identity of individuals' data. And so, two days later, the first program meeting was held, with high hopes and hastily-constructed feedback forms.

Phase III: Implementing the Program

There was a standard agenda for the first program meetings of all experimental groups. Briefly, that agenda called for a general exploration of the data, followed by identification of the stress areas seen as major problems by the group, and selection of one stress area on which to begin work at the next meeting. Each individual was given a packet of feedback materials that included two types of feedback forms--individual level and group level. Data were fed back on eight stress areas that were the foci of the study: Quantitative Work Load, Qualitative Work Load, Responsibility for Persons, Responsibility for Things, Role Ambiguity, Relations with Peers, Relations with Superiors, and Participation. Data on a ninth area, Relations with Subordinates, was not fed back. For groups with only one supervisory-level participant, such data would have identified a person (the supervisor) with his data, and given the supervisor meeting of February 9, that feedback strategy had been abandoned.

Following the first meeting, and weekly during the course of the program, Dr. Seashore and the writer met with the TAs to discuss what had transpired in that week's program meeting and to plan for

the upcoming meeting of each group. The planning generally involved either creating an agenda or structure to explore the next stress area a group was to examine, or else refining the plans for continued work on a stress area with which a group was already involved. As the weeks passed, two features of the program activities began to display themselves prominently. First, contrary to our initial (and evidently naive) assumptions, most groups were taking considerably longer than one meeting to explore a given stress area. We had hoped each group would examine nearly all of the stress areas during the course of the program. When the pattern became evident, we decided to allow each group to proceed at its own pace rather than push them through all stress areas. This was in hope that a group would fruitfully solve at least some problems during the program. Second, it became apparent that in many instances groups were not carrying their problem explorations through the implementation-of-solution stage. Rather they were stopping at the solution-identification or even the problem-identification stage. In the last instance, the meetings amounted to little more than a discussion of group problems. This difficulty never was fully resolved during the course of the program. A third feature bears mentioning, although it involved a staff decision made before the program began. We decided that each group would proceed to examine those stresses it felt were most important to its own work experience. We knew this would sacrifice some rigor on the research side of the venture, but we felt that in order to optimize the potential benefits to the participants, we should not force each group to follow a standard and inflexible program.

And so the program continued, with the debriefing and planning

sessions for the TAs held between each program meeting. In addition, Dr. Seashore and the writer met at least once with each supervisor during the program, to discuss with him his group's program activities.

By the middle of May, all groups had completed their programs. A second round of questionnaires and physical examinations was administered. A few weeks later, the writer conducted a debriefing interview with each TA, to gather as much additional information as possible about each group's program. On-site staff activities then essentially ceased. In mid-July a progress report was sent to participants both in experimental and control groups. This report related briefly what had gone on in the program and sought their cooperation in the final data collection. In late summer, three months after the program's completion, the third and final round of questionnaire administration and physical examination took place.

CHAPTER 4

MEETING SUMMARIES OF EXPERIMENTAL GROUPS

Following are summaries of the program meetings held by each experimental group. The basis for these summaries was the notes taken by the observer present in the meetings. The reader will note that for many meetings these summaries are sorely lacking in content. In these cases, it is because the notes gave only a scant hint of what happened in these meetings.

There are two main reasons for the inadequacy of the notes. First, in some meetings the TA taking an active part in the meeting also had to take notes, due to the absence of someone else to serve as observer. Second, and perhaps more important, the TA/observers simply were not given sufficient training with regard to the amount and kind of information needed to document the meetings adequately. They were not experienced in this kind of observation and so probably could not envision the kind and amount of information they should record, nor the consequences, in terms of inadequate documentation, of their not preserving a rich record of the meetings. It is also possible that they were not motivated enough to perform this task thoroughly, but it would be unfair to ascribe too much of the problem to their motivation.

A few words should be said about the content of the summaries. In general, the summaries rest entirely upon a combination of

description and interpretation by the observer. Where statements are attributed to individuals, these statements are as recorded by the observer and may not be the verbatim words of the speaker. Where the general "feeling" or "position" of a group is noted, again this is as recorded by the observer and subject to that person's biases or inaccurate perceptions. Finally, in cases where my own extended interpretation enters the commentary, I have placed the comments in parentheses.

At the end of the chapter, graphs are included representing the PMR data of all experimental groups. The reader may recall that these data were collected at the end of each program meeting as an additional means of documenting the program. These data are referred to occasionally in the summaries that follow.

Group A

Meeting #1

The group followed the standard agenda for the first meeting (see Appendix B). They reviewed their data, with interest generally evident among them. There were some questions about how the data had been computed. They broke into two sub-groups to identify stress areas. Those identified seemed to fall into the areas of Role Ambiguity, Interfacing, and Superior Relations (with a higher-level superior). The two sub-groups presented the results of their discussions. There seemed to be general interest, with some skepticism about what the program could accomplish. The group sometimes got off the track if direction was not provided.

Meeting #2

The Training Associate (TA) spent a few minutes reviewing for two

members who were absent last week. The group then discussed PMR data indicating an increase in stress during the week before the program began. Progress was slow, with the TA doing most of the talking. Following this, specific stresses identified at the last meeting were posted on newsprint. The TA then spoke to the group on the phases of problem-solving, after which members of the group paired off to interview one another about ambiguities in their jobs. The results of the interviews were recorded on newsprint. This agenda had been drawn up to explore Role Ambiguity, but here it was applied to a general exploration of identified stresses, generating some difficulty in applying the structure of the agenda to the content of the meeting. The degree of involvement of group members, up to the interviewing portion of the meeting, was very low.

Meeting #3

(The supervisor of this group was retiring, and one group member now assumed the role of acting supervisor.) The meeting began with a question that apparently had been circulated by this member during the week: "Just what will this exercise (program) do for us?" The TA answered that any changes from the program would be a result of efforts of the group itself. The group, including the acting supervisor, seemed generally satisfied with this. The group then turned to the data generated by the interviews in last week's meeting. Efforts simply to assign each interview comment to a particular stress area were unsuccessful, and the group decided to have each person explain the comments he had made in the interview. This was done, with discussion following each person's explanation. After the explanations, the TA listed the general problems he had heard

identified: I. what's "hot" this week--developing priorities; II. formal vs. informal system; III. external vs. internal expectations; IV. accomodating technical personnel. At the end of the meeting, the group decided to identify individuals' data (from the questionnaire) to everyone else in the group.

Meeting #4

The problem areas listed by the TA last week were posted as an agenda, and criteria were set up for judging possible solutions to these problems. The group then began work on the problem of priorities--dealing with "what's hot each week" as they called it. Possible solutions were identified, and the criteria were applied to each solution, generating a ranking of solutions according to their desirability. No implementation steps were identified, but the group seemed pleased with the results to date and wanted to continue working on the problem of priorities.

Meeting #5

The meeting opened with a short discussion of PMR data from the previous meeting. Then the most desirable solutions identified at meeting #4 were posted. A discussion ensued about the feasibility of the posted solutions. The group agreed that the solutions could be implemented without having to secure approval at higher levels. It was decided to pick a coordinator from the group who would be responsible for presenting a report the following week on a means for implementing each solution. Four coordinators volunteered, one for each of the solutions identified. Other group members were to give their ideas on implementation to each coordinator during the week. The group seemed determined to see the problem through to a successful conclusion.

The group went on to discuss briefly the other problem areas from meeting #4. At the end of the meeting, the group discussed attendance and agreed that members would not schedule activities during the time slot reserved for program meetings. (This meeting had been postponed one week due to poor attendance.) Satisfaction and participation, as shown by the PMRs, reached their high points during meetings #4 and 5.

Meeting #6

The agenda for this meeting was continued consideration of the matter of priorities, with the presentation of reports on solutions. The first report concerned the possibility of setting priorities at a lower level in the organization. The author of the report was not present at the meeting, so the report was explained very briefly by another person. The TA asked for response from others in the meeting, but got none. The person who gave the report said he did not think it was a very good idea and did not think it would work; higher-level managers wouldn't abdicate that job (establishing priorities) to lower levels. A long discussion ensued, with the main outcome that the most the group felt it could do was to give and try to get explanations of why priorities were as they were. The next report proposed the phased elimination of certain requirements for review by supervisors, the purposes being to free the supervisor for other important responsibilities and to instill more sense of professionalism in those whose work was previously being reviewed. This was discussed at length and a list of items currently subject to review, which members felt should be eliminated from review, was drawn up. There still were no actual implementation plans developed--no action steps.

Meeting #7

The group resumed the discussion of items that could be eliminated from review by a supervisor. A list of ten items was posted on the board. After some discussion, it was agreed generally that this list was "it"--the items that should be eliminated (with one possible exception). The acting supervisor stated that the feasibility of implementing these changes would rest upon convincing higher level management that "we can do the job well, take the responsibility for professionalism." There ensued a general "pep talk" about responsibility and liberty. The TA suggested that everyone take one item and, in the following week, draw up an explanation of how it would be implemented. One group member suggested that it was not so complex, and he volunteered to write recommendations for all items. The acting supervisor and another member agreed to work with him. Recommendations for action on these items was to be the agenda for the following meeting.

Meeting #8

(Notes of this meeting were taken by the TA, in the absence of an observer.) The group discussed the effects of the "decision memo" and a meeting with a higher level manager, attended by the TA and the acting supervisor. (The meeting and memo pertained to the action items from the last meeting. Although no mention of the content of these discussions is given in the notes, other records indicate that the supervisor briefed the third-line manager, and, in a discussion with that manager's assistant, the assistant OK'd all changes.) The TA presented the options for a next stress area to consider. As the group discussed this, a few individuals spoke of

their desire for more Responsibility for Persons, but seemed resigned to no improvement on that, due to the nature of the job. Two other members expressed problems with Superior Relations. The group wanted to treat each stress area in time, but did not really agree on which to treat next. No one was outwardly dissatisfied with the choice of Superior Relations, and it was selected. The two who expressed problems in that area were particularly pleased. Satisfaction with the meeting, as indicated on the PMRs, dropped considerably at this meeting.

Meeting #9

The agenda for this meeting was the consideration of problems in the area of Superior Relations. The group decided to consider only problems with supervisors within their group. Sub-groups were formed, with two sub-groups of subordinates and one of supervisors. The subordinate sub-groups were to answer questions concerning what changes they would like to see in superior relations, what they could do to effect such changes, and what specific aspects of Superior Relations were important to them, as well as provide any specific feedback they wished to the supervisors. The supervisor sub-group was to list both how they saw themselves and how they thought their subordinates saw them as a supervisor, and what problems they had as a supervisor with respect to those they supervised. All sub-groups also were to list what new things they thought could be accomplished with the "new administration"--a new supervisor finally had been appointed to replace the one who retired early in the program. Each sub-group discussed these items and recorded its output on newsprint.

Brief reports were given to the total group (time was short), and the group then went through an exercise in which the subordinates generated a list of adjectives describing how they saw their supervisor, while the supervisors generated a list of how they thought their subordinates saw them. This ended the meeting, with plans to resume the activity next week.

Meeting #10

(The TA again made notes on this meeting in the absence of an observer.) The group discussed the list of adjectives generated at the end of the previous meeting. Both participating supervisors had "fairly accurate perceptions" of how their subordinates saw them. The group was "interested." (The remainder of the TA's brief notes provide little insight into this part of the meeting.) The group went on to discuss performance evaluations and the training of young professionals. (There seemed to be no movement here, no systematic progression of problem identification, solution, and implementation. Rather, the group rambled through a series of little-structured, little-guided discussions.)

Meeting #11

This was the final formal program meeting of this group. The group decided to continue program-type meetings into the future, and to include the new supervisor in these meetings. They identified some topics for discussion in the upcoming meetings. (One gets the feeling that it will continue to be primarily a discussion group; i.e., much talk, comparatively little action.)

Group BMeeting #1

(In a meeting prior to this first session, the supervisor said he felt caught between doing the job for higher level management and looking after the best interests of his men, and that he sometimes had to side with management and sometimes with his men. This position became clear as the program progressed.) The first meeting followed the standard agenda of examining data and identifying stresses. The TA also explained the phases of group decision making, which he labelled as 1) creative, 2) judicial, and 3) decision making. The group split into three sub-groups to identify the stresses of major importance. There seemed to be greatest consensus around Role Ambiguity and Participation. There also was some discussion about intentional withholding of information and bypassing the chain of command. (These were early indications that there were problems with the supervisor at the next level above this group.) The group was quite guarded. Indeed, they had at first refused to put their names on the questionnaire when it was administered.

Meeting #2

The meeting opened with some questioning about why the group was addressing Role Ambiguity first. There also was some general skepticism about the questionnaire (as there had been in the previous meeting). The group then began the standard agenda for examining Role Ambiguity. After the interviews, the group reviewed the results, trying to identify those areas of role ambiguity common to many members of the group. Many of the areas concerned the establishment of priorities for work to be done. The supervisor did much of the

synthesizing at this point, with little participation by most group members. (The observer later characterized the supervisor as "relatively closed-minded" and "pretty much by himself". He also described several factions present in the group at this time.)

Meeting #3

(The TA was absent; another TA took over.) The group continued with Role Ambiguity. They identified the two most important problems as 1) multiple commands to their unit, and 2) turnarounds by management (management changing its mind). Following another input on the stages of problem-solving, they divided into three sub-groups to generate solutions for the above two problems. One group generated some fairly specific solutions. The other two groups proposed solutions of a more general (and sometimes peculiar) nature. As "solutions to all (their unit's) tensions," the second group proposed 1) need more compassion for individuals, 2) need to exercise sound ethics, 3) need education and experience in management. The third group's answers to turnarounds by management included change of, education of, and psychiatric examination of management, and "sufficient manpower so management whims can be humored." The TA instructed the group to think about these solutions, which would be discussed at the next meeting. Satisfaction and participation were at high points during this meeting, as evidenced by the PMRs.

Meeting #4

(The substitute TA again led the meeting this week.) The agenda for the meeting involved examining the solutions generated in the last meeting, selecting "key" solutions, and doing a force field

analysis (see, e.g., Fordyce & Weil, 1971) with regard to each "key" solution. The group discussed the solutions, with three individuals dominating the discussion. The TA explained force field analysis, followed by further debate by the three individuals. Finally the TA interrupted, summarizing the key solutions as 1) educate management and 2) re-establish line management. The group proceeded to attempt force field analyses with regard to the key solutions. (While it is not known how force field analysis was explained to the group, it is true that they identified mainly the beneficial and detrimental outcomes that could result from the two solutions, rather than the forces moving toward and against some changed state of affairs.) The TA then delivered a lecturette on "neurotic self-defeating organizations" (see, e.g., Harvey & Albertson, 1972). He suggested that, in general, the choices for the men when faced with these problems were 1) try to do something about them, 2) continue to live with them, or 3) leave the situation (organization). The group went on to debate whether and how to use their solutions. The TA told the group that it must decide whether they want to "use the solutions or scrap them." More debate followed. In attempting to summarize, the supervisor stated that to implement the solution of re-establishing line management, more personnel would be needed and therefore that solution was impossible. (It seems clear that, at this time, the group had not moved any solutions to the implementation stage).

Meeting #5

(The original TA returned for this meeting; the supervisor was absent.) The meeting opened with one of the men suggesting that the

group had really been working on a secondary problem, that they should get back to Quantitative Work Load, and that he and two others did not want a "confrontation" with management. The group held a long discussion of whether they should push these particular solutions and whether they felt anything at all could be done. The TA recapped the possible solutions as "leave the organization--can't run from problems, they'll be elsewhere too" and "confrontation of groups." The meeting adjourned early. (The group was apparently struggling with an unavoidable problem, yet the actions implicit in its solution were ones they were unwilling to undertake. Satisfaction, Support, and Participation in this meeting were at their lowest points of all ten meetings.)

Meeting #6

The TA came prepared with an agenda discussing Participation as a stress area. He reviewed the PMR data from meetings 1-5, noting the decline in satisfaction, and attributed this to defining a problem, coming up with solutions, and then not implementing them. The group began discussing several diverse topics. After half an hour, the TA recommended going into the agenda on Participation. The supervisor broke in, suggesting a solution of eliminating lower level supervisors, so that the third-level supervisor (the one immediately above him) could directly supervise the people. This solution was determined not to be feasible. The discussion then turned toward manpower constraints and support from contractors with whom this group worked. One person said that the group's major problem was Quantitative Work Load, and if that could be solved by "random discussion", they should not be tied to a fixed agenda. The discussion continued.

The TA suggested bringing in a specialist from another part of the organization to discuss contractor support with the group. The group agreed to this proposal.

Meeting #7

The TA updated the PMR data for the group to include the 6th meeting. He commented that the data (levels of satisfaction, support) had improved. He then requested a summation of the meeting the group had had to discuss contractor support. The results of the meeting seemed to indicate that the group's work load would be lowered somewhat through contracted outside help. The summation and accompanying discussion apparently consumed the remainder of the meeting.

Meeting #8

(The TA was absent, and the observer assumed that role.) The group reviewed procedures to obtain contracted support services. They further discussed their work load in terms of what other groups there were in the organization, that could be called upon to do "quick reaction" work for them. (The Satisfaction and Support scores from the PMR had been rising since their low points in meeting #5; however, they would not reach the levels attained in the early meetings when this group was first beginning to tackle its problems.)

Meeting #9

The group took the entire meeting to discuss aspects of its Quantitative Work Load. They were to list as many tasks as possible, to be followed in the next meeting by a determination of which tasks, if eliminated, would provide the most relief, and which tasks were easiest to eliminate.

Meeting #10

The group began by generally discussing their work load problems, particularly that they got less contract support services than other areas of the organization. The TA suggested that they draw up a flow chart of scheduling events that would include the steps necessary to acquire a contract for support services. The group then broke into small sub-groups to rate the aspects of their work load, which were identified last week, according to how difficult the aspect would be to eliminate, and how much relief would occur if that aspect were eliminated. (As might be expected, there was a very high correlation ($r = .93$) between difficulty of eliminating an aspect and relief if it were eliminated.) The TA agreed to summarize and return that data, and then reviewed the stress-strain relationships that were the basis of the program. One individual commented that "textbooks and our group preach team spirit and motivation, but the more successful people (higher-level management) in this organization use verbal harrassment as a technique, not team building."

Groups C & DMeeting #1

The meeting started with an announcement of upcoming reorganization of the portion of the organization containing this group. (This led to a decision, made in the fourth meeting, to split this group into two for the remainder of the program.) The group discussed the reorganization for a while, then turned toward examining the data. The usual questions of clarification arose. The group did not break into sub-groups to identify important stress areas, but rather continued the discussion as a whole group. It was suggested that they use the

group feedback sheet to initially identify the important stress areas (the ones with the worst fit). On this basis, the stress areas identified were Superior Relations, Participation, and Responsibility for Things.

Meeting #2

The agenda for the meeting involved Responsibility for Things. The supervisor was absent. Small groups were formed to discuss the problems in this stress area, and each group reported the results of its discussion. (No other information is available on this meeting.)

Meeting #3

The agenda for the meeting included reviewing the area of Responsibility for Things and moving on to Participation. The reports from the previous meeting were reviewed. Responsibility for Things was seen as connected to Role Ambiguity, Participation, and Superior Relations. The group particularly wanted more responsibility for the budget. More discussion with supervisors, more delegation, and holding regular work group meetings were seen as ways to alleviate this problem. The supervisors (heads of the two recently-split groups) clarified the budget procedure, and a procedure for starting to hold regular work group meetings was set up. (This group had rarely met as a total group prior to the program.) The group then entered the standard Participation agenda, which would carry over to the following week.

Meeting #4

In this meeting the group, having been recently split in a re-organization, decided to continue the program as two separate groups.

The original observer of the group assumed the TA role for the "newly-formed" group (Group D), while the original TA was to remain with the original supervisor's group (Group C). The TA's would act as their own observers. In the current meeting both groups discussed Participation. According to ratings made by the TA (only one was present), Group C was less relaxed, free, open, and involved than was Group D. No other information is available on this meeting.

Group C (continued)

Meeting #5

(This group had no 5th meeting. Half of the group was absent, and so they cancelled their meeting while Group D continued to hold theirs.)

Meeting #6

In this meeting the group turned to the issue of Superior Relations. The supervisor began by writing on the board each question from the Supervisor Relations index, with the purpose of discussing the index, question by question. The first question concerned delegation of responsibility, and it was considered to be not a problem at that time. The group moved on to the next question, which asked "the extent to which you know what your immediate superior thinks of you, how he evaluates your performance." This touched a sore point for the group. Apparently they had never been given any formal evaluation. The supervisor went to his office to get the evaluation form he used. Upon returning, he explained the form, which had been a secret up until then. The form was required to rank the employees, a requirement set by the next level above him. The men asked to be kept informed in the future of his ratings and the resultant rankings.

It was agreed to review this form when given out in the future. Discussion turned to exposure of employees to higher-level management as a vehicle for gaining promotions. The group felt they were not getting any exposure. The second-line manager did not meet with his subordinates, and thus he was not informed about operations at the lower level. It was suggested that this manager be invited to the next meeting to talk about performance evaluations. A vote was taken, approving the suggestion. The group set forth some questions to be covered in that meeting. They went on to discuss other items from the Superior Relations index. In the area of frankness, confidence, and trust between supervisor and subordinate, they felt that "open communication" would deal with any problems. (But apparently no effort was made to ascertain if there were such problems, nor how to deal with them in specific, implementable terms that could be evaluated as to their effectiveness.

Meeting #7

The group met with the second-line manager to discuss procedures for evaluation and promotion. The manager began by explaining how rankings of personnel were made and the requirements for raises and promotions. The men asked some specific questions on these issues; e.g., how often rankings were made and how many names could be submitted for promotion. The manager explained that the previous supervisor of this group would not attend the meetings where rankings were determined, and therefore the manager had to "make up" ratings for these men. (It seems the former supervisor and this manager did not get along well. The supervisor did not cooperate with the manager;

the manager would not go directly to these men to tell them what he wanted. Therefore, he did not get the results he wanted from this group--and the men got no promotions.) The manager was asked if rankings could be shown to the group and he assented. He also was asked what yardsticks he used to rank people. His answer was general; i.e., "What has the man done of value for me over the last six months." He stated that he felt the quality of work in this group was good, but that he was disappointed in the lack of leadership shown in the group.

Meeting #8

In this meeting the group discussed the general topic of supportive relations. Specific topics included describing different aspects of support, the most and least supportive aspects of this group, the most important ways they would like support to increase, the kinds of support they liked to give, and the kinds they liked to receive. The group split into two for this discussion. Many "most supportive" aspects were listed, including understanding, care, praise, and inspiration. All these also were listed as "like to receive." However, the kind of support they listed as "like to give" was technical support. The least supportive aspects involved having the next level of the organization question all their motives. Getting more of the "most supportive" aspects from that level was the most important way they wanted support to increase. At the end of the meeting, there was a brief discussion of preferences for working alone vs. working in teams.

Meeting #9

This meeting was one of the regular staff meetings of this group

(these regular meetings resulted from preferences expressed by the men earlier in the program--see meeting #3). Each man described the progress of his current work assignment and answered questions from the others. The supervisor also took a small amount of time to pass along information he had received from his superiors.

Meeting #10

The final meeting was to be used for future planning. At the supervisor's suggestion, the group agreed to have a "special meeting of this type" once a quarter. Members of the group said they wanted performance feedback at the meetings. The group also expressed the desire to continue meetings with the second-line manager on a monthly basis to get him more involved, "to make sure he is aware of what we're doing and to insure that our work reflects well on him."

Group D (continued)

Meeting #5

The group reviewed the original questionnaire data, which had been re-figured to include only those men now in this group. Additional stresses were cited by the men, including lack of knowledge of important things happening in the organization (caused by the physical isolation of the group) and knowledge being withheld about a possible impending RIF (reduction in force). Performance evaluations also were discussed, as was achieving a correct match (according to ability) of a man and a project assignment. The group then discussed Superior Relations. (The format of the discussion is unknown, although it apparently included a discussion of the "ideal" supervisor, subordinate, and relationship between the two; and the supervisor

saying how he saw himself as a supervisor.)

Meeting #6

A new member was introduced into the group at this meeting. The supervisor was absent. The group discussed Interfacing as a stress area. One member reported greater interfacing problems than others in the group. The group apparently became more sympathetic to his problems, but there seemed to be no systematic efforts to work at solutions to the problems discussed in the meeting.

Meeting #7

The supervisor was absent again (still on an extended business trip). The meeting again pertained to Interfacing, with Quantitative Work Load also included. According to the TA, the men recognized the problems but could not think how to solve them. The obvious but infeasible solutions were less work or more personnel. The best workable solution, the group agreed, was to have the overloaded person go to the supervisor, explain the situation, and have the supervisor make decisions on priorities and switch work loads where possible. This group was in a rather unusual position--each man did very specialized work, so that it was very difficult for one man to act as a backup to another.

Meeting #8

The supervisor returned and was briefed on the previous two meetings. The discussion continued on Quantitative Work Load and Interfacing. (The notes are very sketchy. It seems that they talked about some work problems of the moment.) At one point one member stated that nobody knew where they stood; there was no recognition, no

evaluation, no exposure to higher-level managers. The meeting broke up early.

Meeting #9

The meeting began with the TA explaining various personnel performance appraisal systems to the members and answering their questions on that issue. The discussion then turned toward scheduling problems and how to deal with them more effectively. The newly-arrived member expressed disapproval of the present system, explaining that in his previous position they had used a modified Management-By-Objectives (MBO) approach. The TA explained MBO in some detail. The supervisor was interested but apprehensive, not wanting to create more paperwork. The TA pointed out that the MBO process would provide better basic data for present reports. The men were hesitant to push the supervisor, but reiterated their concern for better time scheduling, better communications, and some knowledge of where they were and where they were going. The supervisor agreed that the present system was not working, and suggested that at the next meeting the TA demonstrate an MBO approach to the work load of one of the group's members. The TA agreed to bring literature and attempt to demonstrate the process.

Meeting #10

The TA explained MBO chart techniques. The supervisor was still hesitant about creating more paperwork. The TA attempted to develop an MBO chart with one of the men, and found out that the jobs in the group were not really amenable, in his opinion, to MBO charting. One member suggested a matrix-type chart--a man-hour/project chart with provisions for goals and slips in schedules. The group studied

it and recommended changes. They decided to keep personal charts for the next three weeks, then get together to develop the group's scheduling chart after the three weeks of record-keeping. The TA agreed to assist. The meeting ended with the men giving their views of the program.

Group E

Meeting #1

The group started by examining the data fed back from the questionnaire. There were many questions about the data that required clarification or explanation by the TA. They broke into three sub-groups to discuss the stress areas and identify the most important ones for them. All sub-groups were a bit confused and were not progressing well in the task. During the small group reports, the TA continually emphasized consideration of the ease with which a stress could be changed, inhibiting the generation of a list of stresses according to their importance to the group. Finally a ranking of most important stresses from each sub-group was placed on the board. Role Ambiguity was the only stress mentioned by all three groups (being ranked first, second, and fourth) and was made the agenda for the following meeting.

Meeting #2

The agenda was exploration of Role Ambiguity problems. At the beginning, the supervisor asked various members if they understood their jobs, and did they have any ambiguities. The group discussed some ambiguity problems expressed by members. The members then paired off to interview one another about job expectations and ambiguities.

The interview results were posted and the group discussed each item in turn (what should you be doing to accomplish your job; what expectations do others have of what you should be doing; etc.). (The discussions seemed rambling and unstructured. There was one major discussion of mail-routing responsibilities, but its content is unclear from the notes.)

Meeting #3

The agenda involved finishing up Role Ambiguity and beginning to look at Interfacing as a stress area. The TA reported some difficulty in getting the group to open up and discuss the data from the previous week. (The observer was absent, so the TA took notes. The notes were sketchy at best, and gave little idea of what transpired.) The group began to look at Interfacing. They got as far as identifying the major interface problems. The problems involved contractors, a secretary, and two units with which they had to work within the organization. The remainder of the Interfacing agenda was to be picked up the following week.

Meeting #4

The group resumed an examination of Interfacing (following a short discussion of a problem with responsibility for answering the telephone in the office. It was agreed to pursue this matter further in the office when everyone was present--three people, including the supervisor, were absent from this meeting.) Small groups were formed and each went through the following exercise regarding the outside persons or groups that had been identified as loci of Interfacing stress. The small groups were to answer: How do we see them, how do we see ourselves, how do we think they see us, and how do we

think they see themselves. Then they were to identify the critical stresses caused by interfacing with each "outsider" and propose solutions to the stresses. The small group work consumed this meeting.

Meeting #5

In this meeting, discussion of Interfacing problems was resumed. The meeting opened with a discussion of the contractor interface problems. The discussion became rambling and unguided. Possible solutions had been posted on the board, but the observer noted that the TA erased a solution each time any potential problem with it was raised. He further noted there was little organization of answers to the total question of interfacing and no in-depth analysis needed to solve a complex problem. The most favored solutions arising out of this discussion were 1) threat of "minus points" and 2) educate personnel. (The meaning of these solutions was not further clarified in the notes.) The group went on to look at the secretary problem. According to the observer, a consistent leadership pattern emerged once again here: the TA and supervisor initiated discussion, the supervisor evaluated and supported, and group members "gave testimonials". No one regulated or directed the activities of the group.

Meeting #6

The group began discussing secretarial support. The supervisor arrived late and switched the topic to the contractor problem. The discussion rambled on, drifting from one contractor problem to another. It slowly evolved into a kind of "musical chairs" problem exploration, with the TA asking first one member and then another, "Do you have any problems?" If the person reported a problem, it

was talked about for a while. This process continued for the remainder of the meeting. (Satisfaction and Support, which had been on the decline since the second meeting, reached their low points at this meeting.)

Meeting #7

The TA opened the meeting by announcing that a representative from Personnel would be at the next meeting to answer questions about a possible upcoming RIF, since members of the group had expressed a major concern with this. The supervisor suggested that, at the end of this meeting, the group prepare a list of questions they wanted to explore next week. The game of "musical chairs problem exploration" then resumed. As problems were presented, the TA would list them on the board. Several TA behaviors were evident in this process. First, rather than involving the whole group, the TA generally carried on a person-to-person conversation at length with one member at a time. Second, the TA, rather than the members, took a major role in defining the problem. Third, the TA offered the solutions, to be accepted or rejected by the member. (A good lawyer would have said, "Objection! counsel is leading the witness.") The discussion dragged and drifted with little direction. The TA assembled a list of about five problems and accompanying solutions, but none with implementation steps spelled out. The supervisor was displaying little leadership. The problems of the meeting could be summed up as 1) too little structure and focused discussion; 2) too small a part played by the supervisor; 3) too much one-to-one communication; and 4) too much solution-generation by the TA. One had the feeling of watching a giant, living Dear Abby column in action. At the end the group

generated questions to ask the Personnel representative next week.

Meeting #8

(There are no notes for the 8th meeting.)

Meeting #9

The agenda included discussion of the effect on the group of a possible RIF and a consideration of this program in terms of the group's original goals, what had been accomplished, and what the further needs were. In discussing their RIF concerns, the group was to address three areas:

- I. What does the RIF mean to you?
How does it affect the office?
- II. What is the impact of the RIF on our work?
Is this the impact we would like?
How can we alter the impact?
- III. What can we as a group do to cut down the negative effects?

The group discussed these areas in its now-typical meandering fashion. During the course of the discussion, the observer listed on the board the members' comments about each area. With regard to "what can we do," he listed:

- a. draw the line--relieve persons who are safe
- b. get information as to relative danger
- c. get information on future missions
- d. talk about the problem
- e. part-time job, other interests, other income, put wife to work, broaden skills

Again, there were no specific implementation plans layed out. The group went on to look at this program, listing their original goals, what they had accomplished, and what their current needs were.

Goals

to identify stress areas
to air problems
to solve or learn to live
with problems
to get better acquainted

Accomplishments

better acquainted
improved communication
awareness of common problems
solved specific small problems:
-Mr. X's records management problem

Accomplishments

- telephone answering service
- realigned personnel
- Mr. Y's boss problem
- RIF information problem
- Mr. Z's teletype problem

The needs they listed were to solve specific interfacing problems that had been brought up in earlier meetings and to solve "major problems not solvable without (involvement of) upper management."

Meeting #10

This final meeting involved a discussion of whether to make a report of this group's program to higher management. The observer took an active part in the meeting and so made few notes. He reported that the meeting was unusually tense due to the nature of the discussion. The supervisor was opposed to discussing the situation (program results) with his superiors, although he had previously agreed with the program's consultant to do so. The group as a whole mirrored his ambivalence, realizing a need for communication with the next level of management, but fearing to participate in such a discussion, however passively.

Group FMeeting #1

The meeting opened with the review of the questionnaire data. The men were very interested, asked a lot of questions of clarification, and were very intent on understanding just what all the numbers meant. Small groups were formed to discuss and identify the important stress areas. Although few had participated up to that time, everyone participated freely in the small groups. The stresses identified, in order of importance, were: 1) Role Ambiguity,

2) Interfacing, 3) Participation. One member suggested taking up the area of Role Ambiguity at the next meeting, and it was agreed to do so.

Meeting #2

The first stress area to be tackled was Role Ambiguity. The TA reviewed the pertinent items from the questionnaire. This raised several questions from the men. The general discussion that ensued consumed a considerable amount of time, but one outcome was to loosen up the group a bit. The group then broke into pairs for the interviewing on sources of ambiguity. This consumed the rest of the meeting time, with reports to the whole group due next week.

Meeting #3

The meeting began with reports on last week's interviewing-in-pairs. In their work, these men had to coordinate the activities of persons in several units of the organization, and the results of the interviews reflected their problems with this task. They were struggling with expectations to coordinate vs. expectations to manage the committees of which they were in charge. Their difficulties in management resulted from their having no line authority over all the people from these different units. After the interview reports, small groups were formed to identify common sources of ambiguity and discuss what could or should be done to alleviate each ambiguity. The common ambiguities identified were the coordinating vs. managing problem, and having "great responsibility with no authority." The group felt these problems could be solved only at a considerably higher level in the organization and were resistant to trying to problem-solve--"dreaming," as they saw it. The supervisor encouraged the men

to try it anyway, so they did. (The observer stated that half those present believed it to be a useless exercise.) The solutions arrived at by the men involved either shifting their problem-creating responsibilities further up the chain of command (where the person would have authority as well as responsibility), or having various units declared no longer independent, so that this group could exert some authority (management) over those whose activities they had to coordinate. The supervisor agreed to "work on these responses" during the coming week and report at the next meeting.

Meeting #4

The agenda for this meeting was to hear from the supervisor the results of the proposed solutions from last week, then discuss the jobs that must be done by the "committees" these men had to coordinate, and identify the appropriate membership of the "committees" to accomplish their missions. In the time since the last program meeting, a meeting had been held with the manager three levels above this group. The supervisor reported that this manager wanted to continue working within the present system, but that he (the supervisor) wanted to wait for his supervisor (who sometimes sat in with this group) to arrive, so that the men could hear the "full story." He suggested that, in the meantime, they go into the rest of the agenda. One of the men asked if that was really worthwhile, in light of higher-management's response to the proposed solutions. An argument ensued over whether anything could be done under the present system. At this time, the second-line supervisor arrived to report the results of his meeting with the fourth-line manager. In essence, the manager turned down the proposed solutions, stating that the structure would remain the

same, and that these men should take any of their coordinating/managing problems up and down the appropriate chains of command. The second-line supervisor was asked what was accomplished by going to the manager. This supervisor said the manager appreciated what was said, but did not see the problem as unique, but rather a typical management problem with no solution. The discussion turned toward the agenda on defining committee jobs and membership, although small groups were not formed as planned. The group was in a state of upset over the results just announced. The discussion continued until the end of the meeting, with an agreement for everyone to come back next week with ideas on appropriate committee membership.

Meeting #5

The meeting opened with a review by the TA of the theory behind the program, since some of the group seemed to be losing sight of the framework and goals of the program. The TA asked for results from last weeks questions on committee jobs and membership. Only a few had thought about it. One man gave his views, and this prompted a long discussion that turned into one of motivating--how to get people to do their jobs--rather than what jobs the people were supposed to be doing. Opinions on how to motivate ranged from giving the men responsibility to giving them "a kick in the ass." People continued to press their own opinions, with no one consolidating or summarizing toward conclusion. Finally the supervisor suggested that his men start a "get tough" policy with their committee members, using milestone schedules as a weapon. The second-line supervisor agreed, but stated that there would be no support from higher-level management. The first-line supervisor then suggested that either he, the second-

line supervisor, or his assistant attend each committee meeting as a representative of management. The men unanimously vetoed this idea. (At this point the observer characterized the group as constantly talking about issues but never reaching conclusions, and always placing blame on management two levels above them.) The second-line supervisor asked if the men really needed these committees. There were no unqualified "yes's." The most positive responses were "the structure is valid," "you work around people," and "as rotten as it is, another approach would probably be worse." The second-line supervisor then said, "Let's get one thing clear, you're not going to be able to get rid of the committee."

Meeting #6

The supervisor drew up the agenda for this meeting. He presented a draft memo, written by him three months before, defining the charter and membership of the committees that had been the issue discussed the last few meetings. He wanted input from the men in order to re-draft the memo. Small groups were to be formed for discussion. These groups were first to agree entirely, partially, or not at all with the committee concept. If they agreed only partially, they were to propose modifications in terms of charter, membership, and functions of the committee. If they did not agree, they were to identify a feasible alternative. The small groups met to discuss this. All had at least minor modifications to propose. The supervisor kept very tight control of the meeting, not allowing much time for discussion when the small group results were presented. At the end of the meeting, he summarized the comments, and said he would rewrite the draft memo, incorporating the comments from this meeting.

Meeting #7

This was a staff meeting conducted by the supervisor. At the end of the "business portion", the group members were to analyze the meeting in terms of the quality of work accomplished, the participation evident, and the role played by the supervisor. They also were to discuss any changes they would like to see in future staff meetings. The meeting developed into primarily an information-giving session by the supervisor, with occasional discussion and participation by others. The last portion of the meeting was reserved for a "guest speaker" on a technical matter. The group never got to the analysis and evaluation of the meeting's content and process. The observer handed out sheets listing the questions to analyze and evaluate the meeting, and asked that the men make comments to be discussed at the following meeting.

Meeting #8

(Dr. French, the research director of the program, was present at this meeting.) The supervisor reviewed responses to the evaluation questions about the previous meeting. Only three men had responded and only four were present at this meeting. He then turned to the committee charter (discussed in meeting #6), stating that the problem had not been resolved, but it would not be part of program discussions anymore. This decision was made in an effort to get the group to move on to more concrete and hopefully more solvable problems. The meeting then became an information-giving session for a while, similar to last week's. The group then turned to a review of the program to date, and a consideration of future meetings. The supervisor asked "what has been accomplished so far?" One responded that "we have defined problem areas but haven't done anything about them."

Dr. French asked why the problems were not solved. The supervisor explained the group's progress in looking at Role Ambiguity: that problems and solutions were identified, but the solutions turned down; that the group continued considering Role Ambiguity because all problems were related to that, but it had caused frustration; and he therefore was recommending that they move on to another stress area for consideration. Group members then expressed mixed disillusionment and desire to continue reaching for a success. One man stated that he would like to go on to Quantitative Work Load, since there was a good deal of duplication there that could be eliminated, while another stated that members had started arranging meetings to conflict with these sessions, and that "if you define the problem and can't do anything about it, you're worse off than not knowing what to worry about." The remainder of the meeting was taken up by discussion between Dr. French and the supervisor.

Meeting #9

The agenda for this meeting concerned Quantitative Work Load. The purpose was to identify job aspects that might be changed within the group's authority, in order to reduce the present work load. The group reviewed the questionnaire items on Quantitative Work Load. Each man then stated those work load items that he felt created an overload for him. The common items mentioned were meetings, phone calls, and "special tasks" ("garbage" or non-project-related tasks). With regard to meetings, the group felt that standard meetings were a waste of time, although meetings on specific issues, if properly prepared for and conducted, were valuable. No recommendations or action steps evolved. The group turned to "special tasks." The

supervisor listed several specific ones on the board. The group began discussing the first one: milestone charts (schedules of completion dates for various aspects of a project). The group felt the charts were a "special task" because they were too standard (not tailor-made to a project) and project dates were slipped so often that the charts became meaningless. In order for the charts to become project-oriented, they should be used and even compiled by the persons directly affected--the committee. (But again, no action steps.)

Meeting #10

The agenda for the final meeting included continuing with Quantitative Work Load and looking toward the future. In opening the meeting, the supervisor announced that he had checked into the possibility of a course to aid the men in their conduct of committee meetings. He said it was a possibility; he would continue to work on it and report the progress at weekly staff meetings. He then reviewed the last week's meeting, since several men were absent from it. He reviewed the discussion of milestone charts and said that, although the ones presently used were not that good, he would prefer that the men use the standard chart form until a better one could be developed. Some argument arose about the men instead using their own versions or none at all, but he held his ground. A few other issues were discussed, and then some vague words were spoken about future problem-solving work of this nature. The supervisor said he was going to give as much authority as possible to his men--at least as much as he had control over. The meeting concluded.

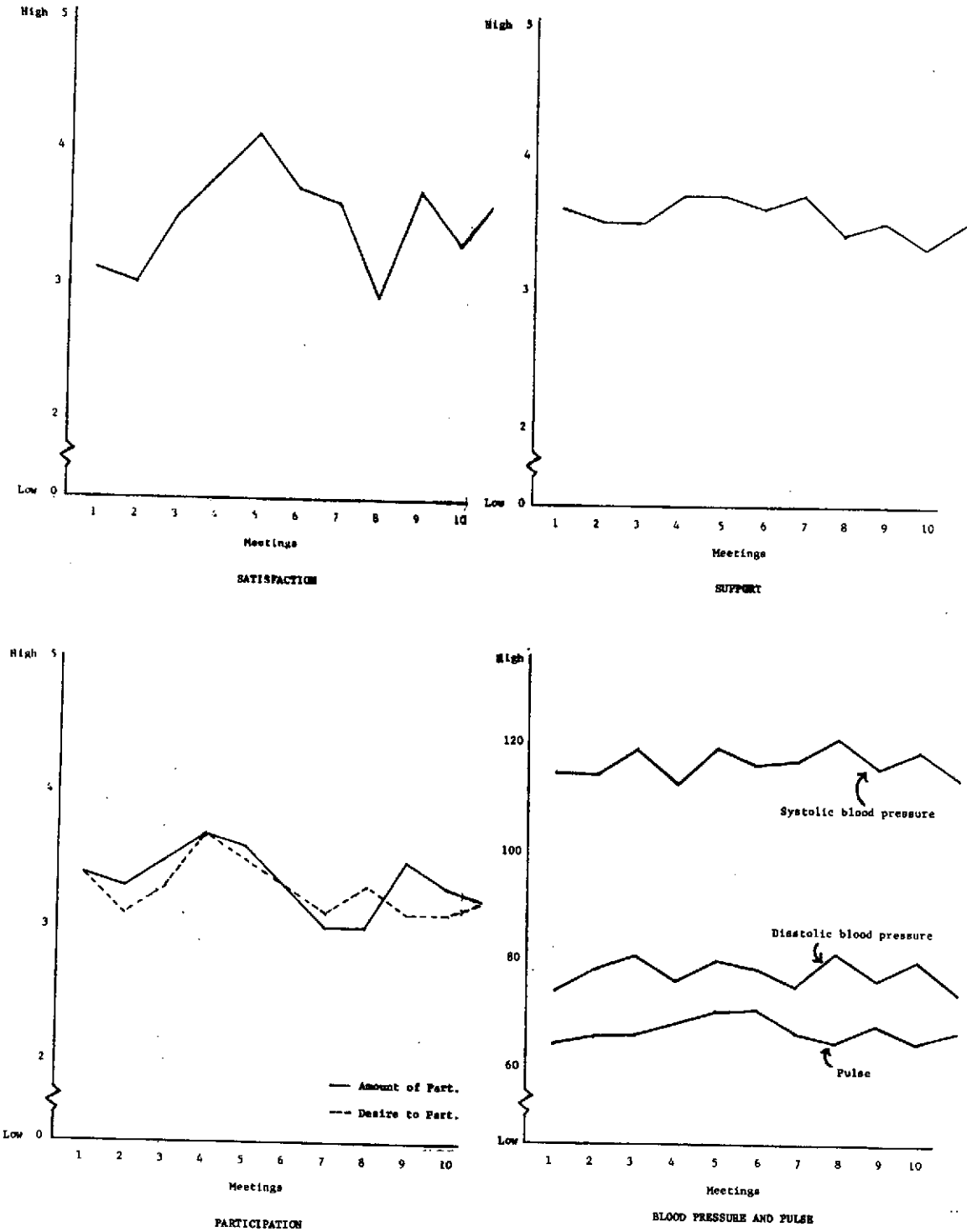


Figure 4. PMR data for Group A.

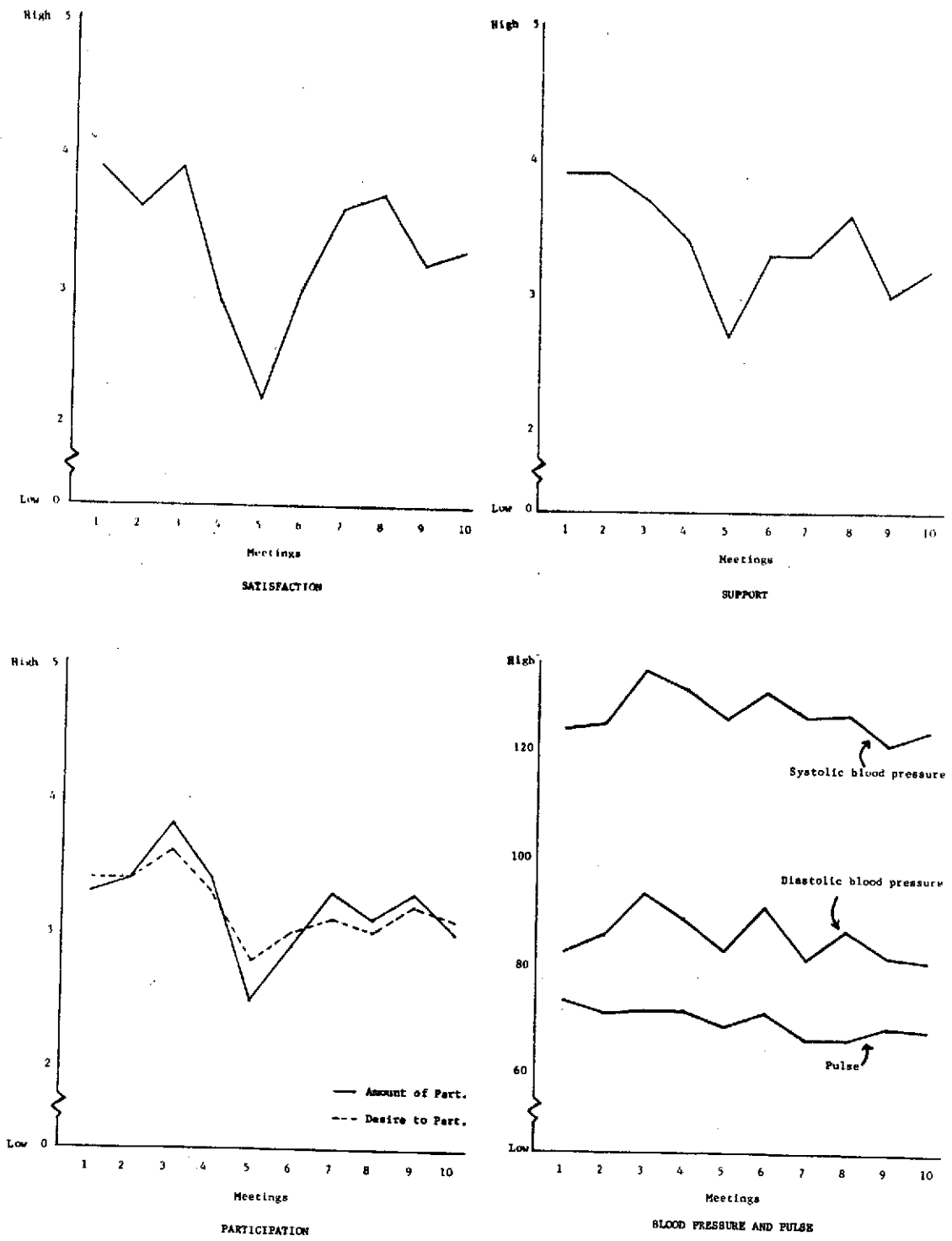


Figure 5. PMR data for Group B.

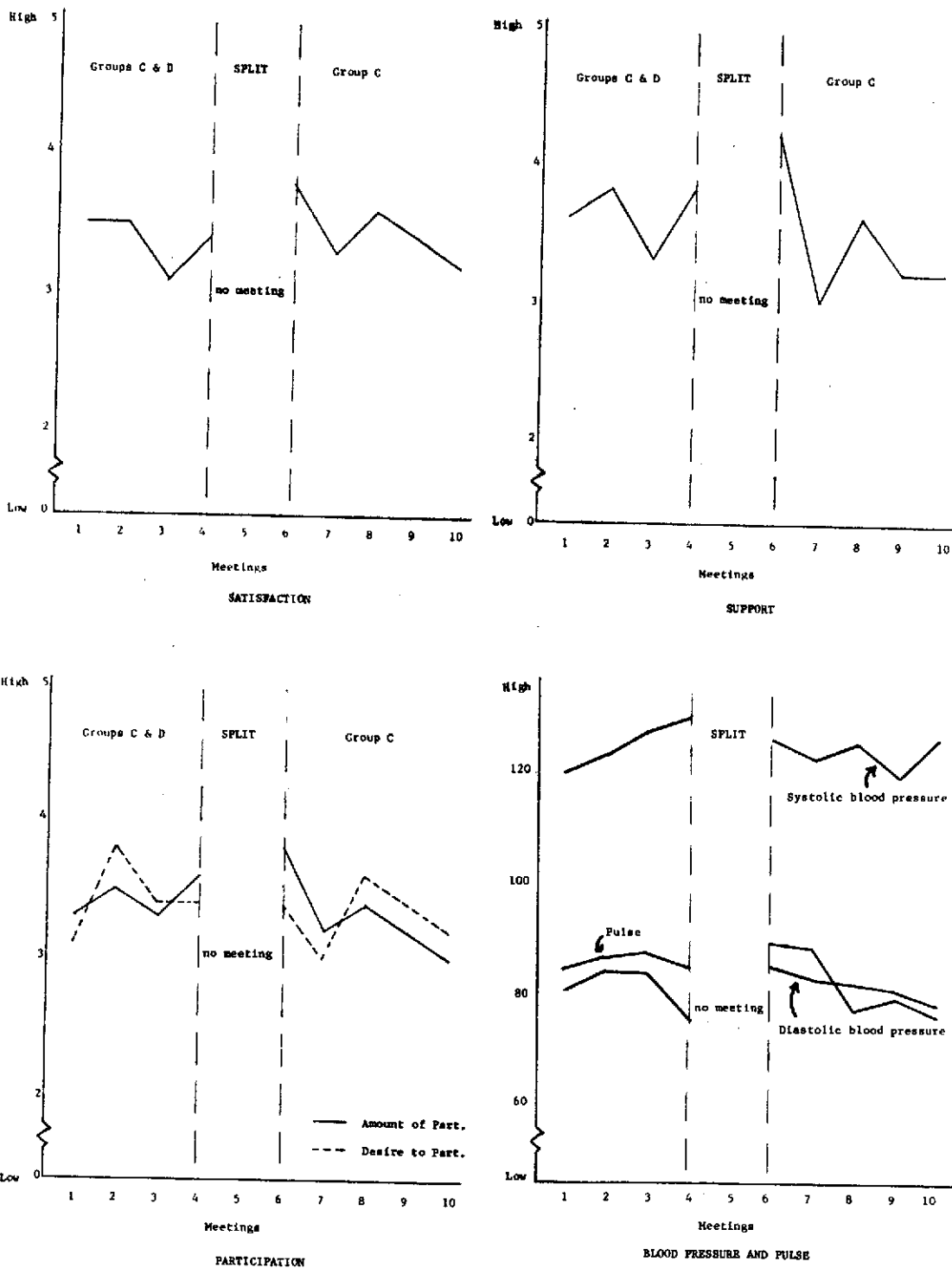


Figure 6. PMR data for Group C.

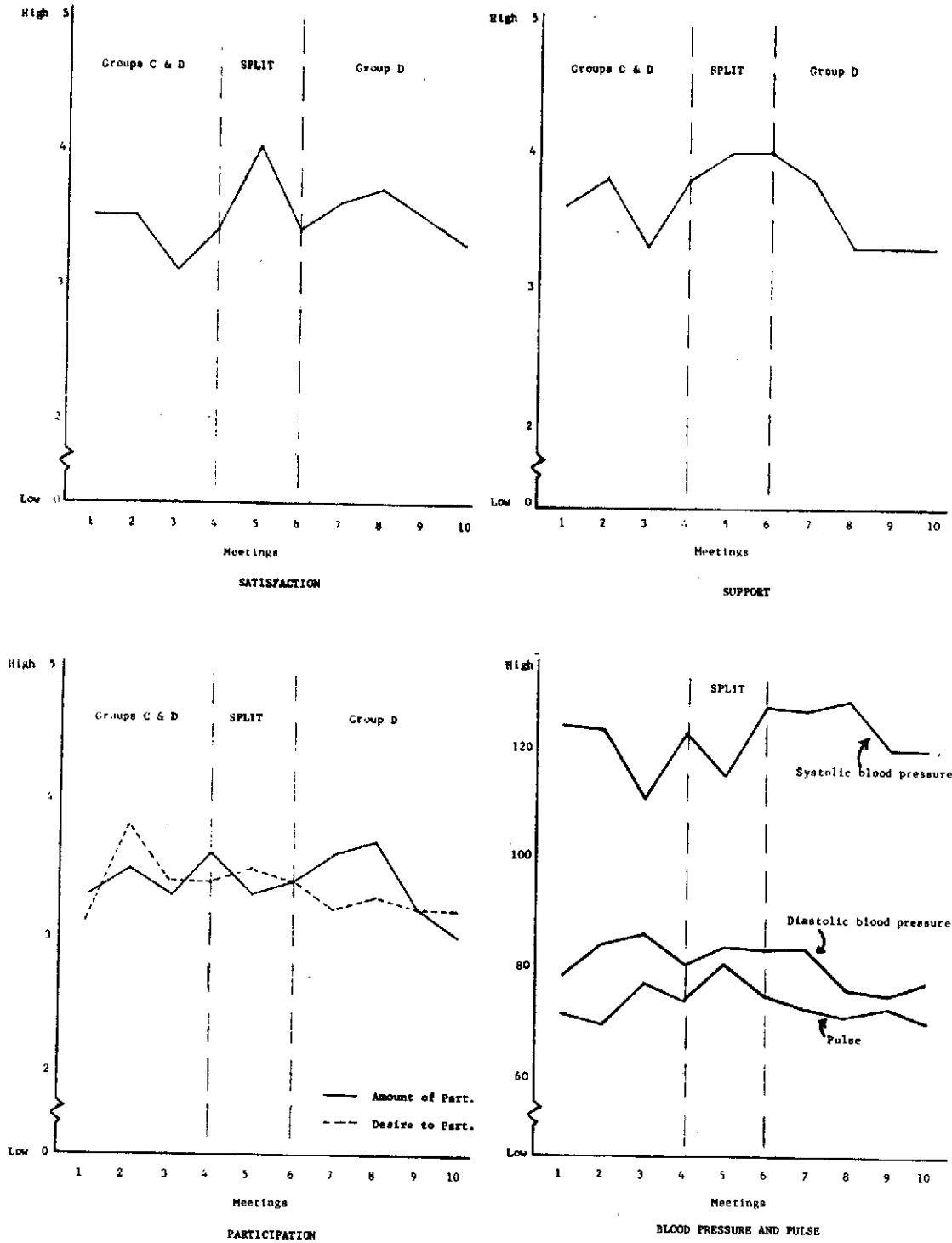


Figure 7. PMR data for Group D.

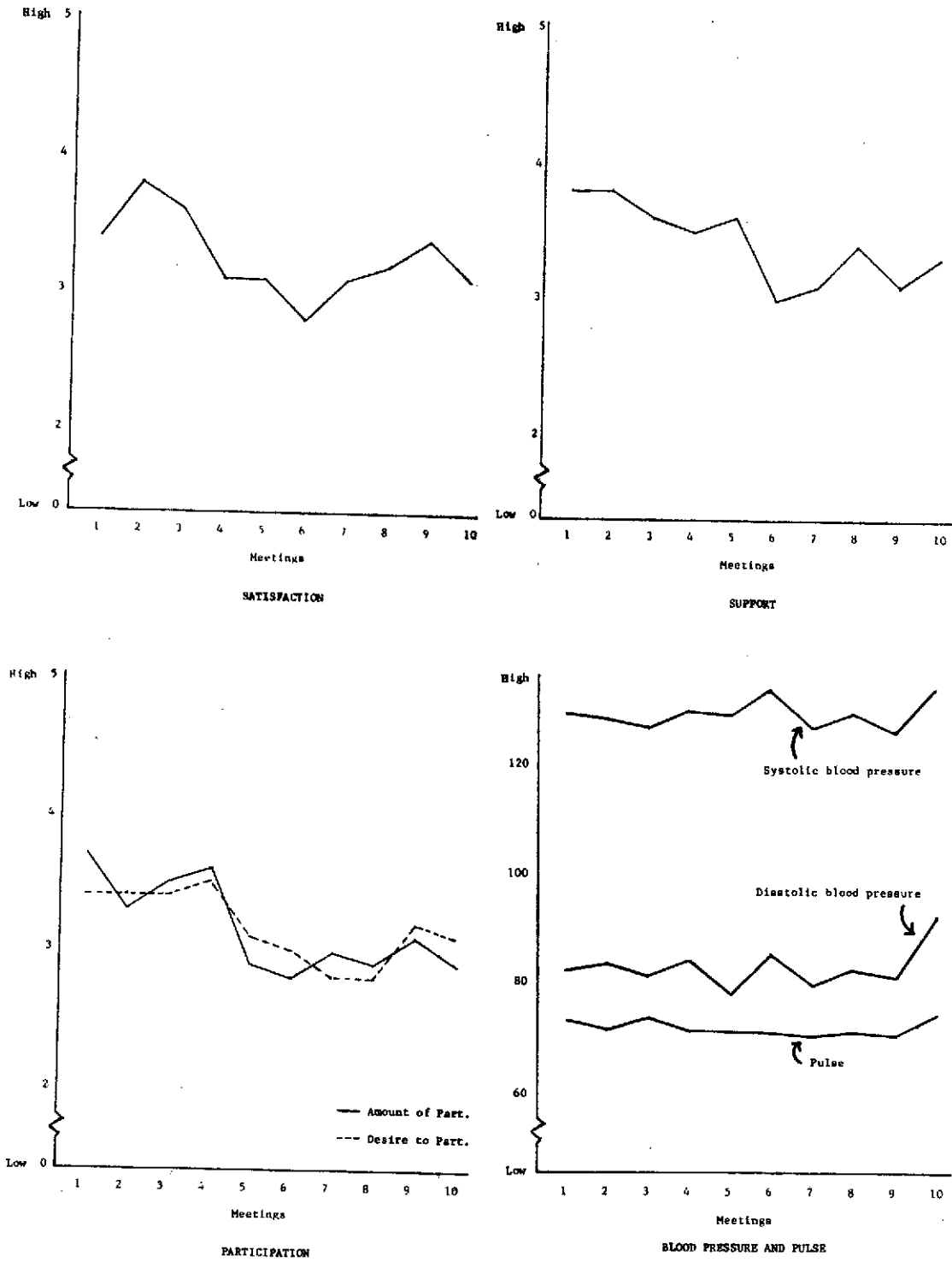


Figure 8. PMR data for Group E.

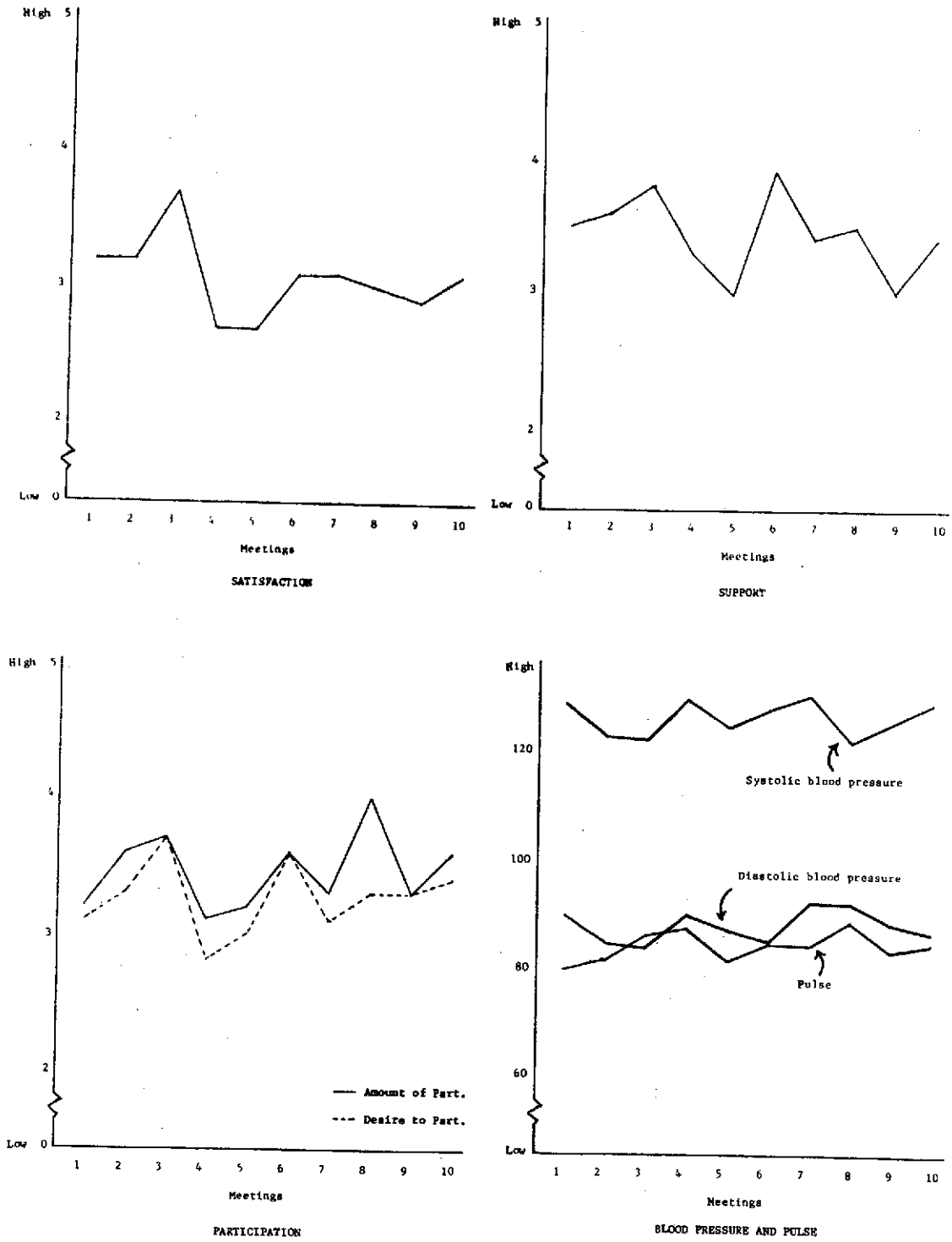


Figure 9. PMR data for Group F.

upon by the group and any important successes or failures encountered by the group are recounted; and finally, speculation is made about how members of the group may have experienced the program in which they participated.

Group A

The first three meetings of this group mainly were taken up with zeroing in on some particular problem areas to work on. Unlike the other groups, these men did not choose a particular stress area (e.g., Role Ambiguity) to examine. When they did settle upon some problems to examine, their problem solving process was fairly thorough. They defined four problems (although perhaps not so specifically as might have been desirable), then chose one ("priorities") on which to begin working. They generated criteria on which to judge proposed solutions, then generated the solutions and evaluated them in terms of the criteria. They then identified what seemed to them to be the most feasible solution (eliminating some paperwork--reports automatically subject to review by superiors). A list of the paperwork items proposed for elimination was drawn up. This entire problem-solving process consumed about four meetings. Between the 7th and 8th meetings, the acting supervisor met with his superiors and secured approval for the proposed changes, and he announced this approval at the 8th meeting. The men then cast about for a next problem area to examine and settled (apparently without much consensus) on Superior Relations. They consumed the better part of two meetings (9 and 10) on this area, with no discernible accomplishments. This group had an 11th meeting, so that they could devote a full meeting

to planning for the future. By the end of the program, they had decided to continue such meetings into the future, and they identified some problems they would like to work on. There are no records of any of these subsequent meetings.

The group lost its supervisor, through retirement, at the beginning of the program. An acting supervisor headed the group throughout the program. This supervisor was quite active during the program, although he did not really lead the group in its program activities. Perhaps his most important role was in influencing the "contract" the group had with the TA. At the beginning of the program, he was quite skeptical of what the program could accomplish, and the TA met with him after the second group meeting to discuss this. Reporting on this meeting, the TA said, "I got the supervisor's support when I scaled down my expectations to his--that there are some problems that can't be solved, but if the men see that, they'll be able to live with them (the problems.)" And so, according to the TA, in the third meeting the contract changed from "I'm here to help you solve your problems" to "I'm here to help you deal with them and live with them."

The TA's role changed from being a very active leader at first, to being a less active guider. He would recapitulate from the last meeting, start a discussion, then let the group talk, serving as a "recorder" and tossing in questions occasionally for the group's consideration.

It is difficult to characterize the stress areas worked upon by this group. Only once did they address a definitive (in this study's terms) stress area: Superior Relations in the ninth and tenth meetings. It seems that no problems were solved there; rather the area

was opened up for discussion and consideration. Indeed, this tendency toward discussion rather than action seems to characterize the majority of the program for the group and perhaps stemmed from the orientation, mentioned above, to "learn to live with problems."

This group seems to have solved only one problem during the program--the elimination of some paperwork they felt was unnecessary. In terms of the stresses conceptualized in this study, one perhaps may consider that action to relate to Quantitative or Qualitative Work Load. But while solving that problem may have given the men some feeling of accomplishment in the program, it seems unlikely that it would have a major long-term effect on any stress area. No other stress areas were dealt with to any great degree, particularly those involving interpersonal relations and participation. And, according to the TA, the group never focussed on improving the P-E fit of particular individuals.

This group was a curious mixture of failure and success. They must have been influenced by the supervisor/TA attitude of "learn to live with your problems; most of them can't be solved," and yet they did go on to do some successful, though fairly minimal, problem solving. In addition, they decided to carry on with program-type meetings at the conclusion of the formal program. Looking at the participants' comments on the final PMR (see Appendix F), it may well be that these men saw and appreciated the meetings as an opportunity to openly discuss problems with one another, and this was good enough for them. One has a sense of pessimism, however, that much action toward changes will arise from the group.

Group B

The first stress area the group examined was Role Ambiguity. They identified two problems common to many members of the group and generated solutions to them. They chose two key solutions and looked at the positive and negative aspects of implementing those solutions. A debate arose about the practicality and wisdom of trying to implement the solutions. This debate consumed much of two meetings. It became evident the group was not willing to act on these solutions, and they moved on. They turned to the area of Quantitative Work Load and, through a meeting with a representative from another part of the organization, determined that there were possibilities to reduce or alter their work load somewhat through contracting for support services. The group continued to examine Quantitative Work Load until the end of the program, with no further action steps taken.

The supervisor of this group took little leadership throughout the course of the program. According to the TA, he never was committed to the program to a large degree. He was, in many ways, thought of by the group as "one of the boys" and he participated as "one of the boys". The TA for this group was relatively inactive during the beginning and middle of the program; (he reported, "they wouldn't let me do more than that"). Near the end, he took a more active, directive role as the group examined work load. It should be mentioned also that another TA substituted during sessions three and four, when the group was struggling with its solutions to the Role Ambiguity problems. He led them through a force field analysis of the solutions and also delivered a lecturette on "neurotic self-defeating organizations" when the group was immobilized regarding

implementing its solutions.

The stress areas examined by this group during the course of the program were Role Ambiguity and Quantitative Work Load (and to some degree Qualitative Work Load). The efforts with regard to Role Ambiguity can only be classed as a failure experience (more will be said of this later), and perhaps it was unwise to begin with such a difficult problem (although neither the TA nor other program staff members knew the magnitude of the problem initially).

When the group moved on to Quantitative Work Load, they had some degree of success. They found they could get some work load relief through contracted support. This potentially could have affected both their Quantitative and Qualitative Work Load, since in addition simply to having some work taken away, the TA also suggested that they contract out those aspects of work they did not particularly like, to improve the kind of work contained in their jobs. This problem-solving event was admirable, for this program, in that it not only included implementation but also evaluation--the group set up a sub-committee to report each week on the progress of securing contracted support. This was an opportunity for them to evaluate the effectiveness of the solution they had implemented.

Other than the above-mentioned stresses, the group did no work on other stress areas. There was no work on Participation, and indeed, before the program was even over the supervisor was allowing less participation in decision-making than he had in earlier meetings. He started making some contracting decisions on his own, rather than utilizing the sub-committee mentioned above. With regard to interpersonal relations, no work was done, and the group paid no

particular attention to the P-E fit of individuals.

This group displayed various problems from the beginning. According to the TA, for example, in the pre-program orientation and questionnaire administration meeting, the members were nervous about how the data might be used by management. They did not want the TA to finish the presentation in the room they were in, being afraid they would be overheard and it would be used against them somehow. They also started at the bottom in terms of cooperative group action. Their meetings often developed into shouting matches among the members. The first problem they tackled was perhaps the most difficult for them. They did indeed display many of the "neurotic organization" symptoms described by Harvey (see, for example, Harvey & Albertson, 1972). First, the group seemed to be experiencing pain and frustration with regard to their Role Ambiguity problems. Second, they blamed another (the next-level superior) for the problem. Third, there clearly was subgroup formation present, although (fourth) there was general agreement as to the character of the problems. And, finally they acted contrary to the data and information they possessed: they identified the nature of the problems and the solutions necessary to alleviate the problems, but they were unwilling/unable to take steps toward implementation. By the time the fifth meeting approached, the TA heard rumors of an impending "coup" in which the men were going to demand to be let out of the program if they were not "let off the hook" with regard to the problem area they were addressing.

How must this program have been experienced by these men? Splits of several kinds characterized this group, and it seems likely that these same splits existed in some members. The first split was

between those members trusted by the supervisor (seen as loyal and aligned with him) and those not trusted (perhaps loyal and aligned with the next-level manager). Second (and shown by the PMR data), great satisfaction accompanied discussing the problem and pinning the blame, but great dissatisfaction accompanied confronting the possibility of having to do something about it themselves. Third, there was great dispute about whether to push the solutions or let them drop. And finally, as the end of the program neared, there was some anxiety and disappointment at not having accomplished the program's goals, while at the same time relief at unburdening themselves of this generally unpleasant experience. Final comments on the PMRs indicated that there was some ambiguity from the beginning about what they were to do in the program, that the program had provided opportunity for discussion and clarification of some problems, but that there was general discouragement about what was accomplished and the possibilities for later accomplishments.

Group C

Up to the beginning of the program, this group and Group D were, organizationally, one work group. As the program began, a re-organization split the group and, for program purposes, the groups met separately after the fourth meeting. Before the separation, Responsibility for Things and Participation were examined. The exploration of Responsibility for Things included clarification of the budget procedure for the men and a provision for holding regular work group meetings (such meetings had been a rarity in the past). The exploration of Participation was apparently mainly a discussion, with

little or no action taken. After the split, the primary activities of Group C were examinations of interpersonal relations in the group and a meeting with the second-line supervisor to discuss performance evaluations.

The supervisor of this group took virtually no leadership responsibilities at the beginning of the program. As the program progressed, he took more and more leadership, however, and became more open to the group's influence. As the program neared completion, the supervisor was making real progress, according to the TA, in allowing participation and group decision-making. But "he still probably wouldn't have done it if I hadn't been nearby for him to turn to if he had problems."

The leadership role of the TA dropped in accordance with the supervisor's increasing leadership (although it seems clear he continued to play a strong supporting role). His general position toward the group no doubt was influenced by his own goals in the program. He saw the program as a training device to improve the management, communications, and effectiveness of the work group, with a particular emphasis on Superior Relations.

Several stress areas were addressed by this group. Early efforts on Responsibility for Things yielded some results (see above). There also was an early agenda on Participation. While that meeting seemed not to generate any action steps, the TA reported that effort toward participation was an underlying focus of nearly every meeting. The general area of interpersonal relations was worked upon in several instances, and also was a primary focus of the program for this group, according to the TA. Looking back at the program, he

characterized the group as having mainly worked upon Superior Relations and Participation, although improvement in these areas just was beginning to occur as the program concluded. Regarding other stress areas, none was addressed directly; it does seem possible that Role Ambiguity may have been affected (beneficially) by the discussions on performance evaluation that occurred both with the group's supervisor and in the meeting with the second-line supervisor. Finally, according to the TA, no efforts were aimed directly at improving a given individual's P-E fit.

Looking back over this group's entire program, it appears that more attention was paid to improving participation and interpersonal relations here than in any other group. Anecdotal evidence, however, suggests that any results may have just begun to occur at the end of the program, and it is at least questionable whether they would be sustained. In the debriefing interview, the TA emphasized more than once that progress was just beginning, and it seems likely that there was a long way to go, since P-E fit with regard to both Participation and Superior Relations was poorer for the men in this group than in any of the other five groups at Time 1, before the program began. Recall that this group had rarely had group meetings in the past, and they were completely unaware of the means by which they were evaluated by the supervisor, until this subject was discussed and the "secret form" revealed in the sixth meeting. Apparently this supervisor paid little attention to the interpersonal aspects of the group's work environment, being mainly concerned that all the tasks were done on time. And although he seemed to be shifting his orientation somewhat near the end, it was the TA's opinion that he (the

supervisor) would revert back to his old ways with the elimination of the support, assistance, and reinforcement provided within the program. As the TA put it, "He'll be socialized back into the organization from whence he came."

It is difficult to get a clear picture of what the program must have looked like for the men involved in it. On the one hand there were some initial breakthroughs in gaining information and establishing contacts (with the second-line supervisor) and, perhaps, having more contact with their supervisor and with one another. Problem areas had been identified and had begun to be worked upon. On the other hand, there was some discouragement about solving problems that included persons outside the group and may have necessitated the involvement of management at higher levels. Additionally, the program was terminated just as progress had begun in resolving most problems. The situation may have been one in which the group was exposed briefly to some possible improvements, whereupon one vehicle for obtaining those improvements (program meetings) suddenly was eliminated.

Group D

This group was a part of Group C at the beginning of the program, so its history was the same as that of Group C through the fourth meeting; i.e., some work on Responsibility for Things and Participation. Following the split, the group spent a small amount of time on Superior Relations (with unknown result), then spent a considerable amount of time on problems of Interfacing, which came to include Quantitative Work Load as well. It seems few specific solutions to these problems arose. As the group concluded the program, it was attempting to develop means of eliminating some of the

participants' work scheduling problems.

During the program, the group's supervisor was just beginning to define his role in the group, since he had only recently assumed leadership of the newly-formed group. Furthermore, he was absent from two of the six meetings the group held after it had split from Group C. In all, his degree of leadership in the program meetings seemed moderate at most. The TA played a very active role, according to his own report, and this may have influenced the supervisor to take a fairly small amount of leadership in the meetings.

Aside from the early work on Responsibility for Things and Participation, this group concentrated heavily on Interfacing and Quantitative Work Load, but according to the TA, "I don't think we had much success." The effort on Participation was brief and, again according to the TA, the men realized it was not really a problem for the group since everyone worked so independently of one another. Virtually no effort was expended on improving interpersonal relations. Regarding P-E fit, this is the only group in which attention was paid to improving the P-E fit of particular individuals. The TA reported that when the group was examining Interfacing and then Quantitative Work Load, particular attention was paid to two members. These efforts resulted in little or no relief, however, other than sympathy from others in the group.

All in all, there seems to be little anecdotal evidence of achievement in this group. The debriefing interview with the TA provides a picture of a group not terribly willing to attack its problems. The TA's impression of the men was "as scientists, they thought they should take these organization problems in stride and suffer in

silence." And indeed, they never came to a resolution of any problems. Influential events in the program were coincidental to, rather than a result of, the group's efforts. Perhaps the most positive event was the separation of the group from Group C, and the most negative, the absence of the supervisor during a few meetings, at which point the members "kind of drifted apart," according to the TA.

If the TA's interpretation of the group's relative lack of interest or commitment is correct, what could they have gotten from the program? A look at the men's final comments on the PMRs suggests that they saw it mainly as an opportunity to identify and understand the problems that existed among the members of the group. It also appears that they were fairly pessimistic about their being able to effect any changes. One's impression at this point must be that any benefits that might have occurred coincident to this program arose either from the group identifying (but not solving) mutual problems, or from occurrences not attributable to the efforts of this group.

Group E

Group E first explored Role Ambiguity as a stress area. They finished it in a meeting and a half, and while apparently many problems were discussed, it is unclear what actions were taken. They went on to Interfacing and consumed about three and a half meetings discussing problems in that area. Another meeting was taken up with talking about diverse problems, followed by a meeting at which a Personnel representative answered their questions about a possible upcoming RIF. In the ninth meeting, the group discussed the effects on the members of concerns about the RIF, and what they might do about

these effects; they also looked back over the program, identifying their initial goals, what they had accomplished, and what their further needs were. In the final meeting, the topic for discussion was whether to present a report to management, and in what form.

The role played by the supervisor in this group's meetings approximated that of an active participant. It was no doubt clear to the members that he spoke in his capacity as the work group supervisor, yet he never took responsibility for conducting any of the meetings, preferring to participate as one of the group. The TA took, in this writer's opinion, too active a role in the meetings. Often the TA would solicit information from the members about problems, then formulate the statement of the problem and offer solutions for the group's consideration.

The only two stresses directly addressed by the group were Role Ambiguity and Interfacing. The results of their efforts to alleviate Role Ambiguity are not clear; with regard to Interfacing problems, solutions were identified, but not in any implementable sense. Some efforts of the group, while not aimed specifically at Quantitative Work Load, may have had an effect on that stress area. More will be said of this later. The group did not work on interpersonal relations during the course of the meetings. However, comments by both the TA (in the debriefing) and several group members (on the final PMRs) indicated that members did come to know and understand one another better. No formal efforts were made with regard to Participation; neither was improving individual P-E fit concentrated upon.

On the whole, this group seems to have been characterized by rambling, little-guided discussions. The supervisor described the

group's jobs as "mundane, everyday" kinds of work. The sometimes sketchy, sometimes difficult-to-decipher meeting notes leave one feeling that very little was accomplished in this group's program. But information from the TA debriefing interview suggests that two actions arose from the program that may have had important benefits for the group. Let us look at each of those now.

Before the program began, this group was informally divided into three sub-groups, each with its own "leader." As a result of discussions early in the program, these sub-groups began holding meetings weekly. Also, whenever the "leaders" met with the supervisor, they first went to their sub-group members to see if there were any problems to be brought up in the supervisor's meeting. According to the TA, this procedure continued after the formal program had ended. The second potentially important action that arose from the program was "cross-training" of group members. With some training, members of the group could assume the duties of other members in their absence. This training process was begun as a result of program discussions, and may have provided some benefits with regard to work load. For example, if an individual were on vacation, large volumes of work would accumulate to be confronted upon his return. The cross-training provided an opportunity for other persons to assume some of that work while the person was absent.

There are several aspects to examine in speculating upon the experience of this program by members of Group E. First, there were actually some problems solved. Two general ones have just been discussed. In addition, in the ninth meeting the group listed several smaller, more isolated problems that had been solved, as well as

the further general accomplishments characterized by them as becoming better acquainted, improving communications, and becoming aware of common problems.

It should be recognized that, according to the TA, this group had been reorganized and "RIF'd" shortly before the program began. They were operating at less than full strength, and, in addition, some of their manpower was composed of people new to the job. It may have been seen by them as beneficial just to be able to talk about their problems--on the final PMR, this was mentioned as the most satisfying aspect of the program by several members. One member called it "airing stress areas via group therapy." Also, the next possible RIF was of considerable concern to these people. The session with the Personnel representative and the subsequent program meeting with the RIF agenda may have helped them confront this evidently stressful situation.

The program ended on an unfortunate note, however. Earlier in the program it seemed that it might be beneficial for management levels above this group to be made aware of some of the problems this group was experiencing. The issue became, whether to make a report to management on this group's program and in what manner. Members of the program staff (including the program consultant, this writer, and the group's TA) met with the supervisor to discuss the matter. The staff's position was that the group should take ownership for making such a report, although staff members would be happy to sit in and assist with any meeting at which a report might be made to management. The supervisor seemed to agree with this approach. However, before the next program meeting and for reasons unknown, he changed

his mind and decided that any report of results should be the staff's responsibility. The tenth meeting was devoted to discussing the possibility of a report. The group seemed to reflect the reticence of its supervisor. On the final PMR, members were asked if a report should be made and in what manner. Opinion was almost unanimous in support of a report being made (see Appendix F), but the group did not want to take any responsibility itself for the report. The staff's position (that the group must take responsibility) remained firm, and so, as far as is known, no report was ever communicated. Therefore a program that may have been experienced as successful to some degree, must have ended on a sour note for most, both group and staff members.

Group F

This group began by looking at Role Ambiguity and continued through the sixth meeting working on problems in this area. In some respects their efforts may be characterized as resulting in discouraging failure, rather than success or even no progress at all. They tried to regroup and go on to another area, Quantitative Work Load, but had little success there either.

The supervisor of this group was perhaps the most active of any of the supervisors in the program. He gradually took over leadership in the program meetings until he had virtually sole responsibility for the meetings. The TA's role was reduced (or nearly eliminated) accordingly. While the supervisor expressed sincere interest in what the program might do to benefit his men, his actions may have affected the program adversely, in terms of the stress reduction goals originally set forth. According to the TA, the supervisor wished to

utilize the experiment to bring out the problems in his organization and hopefully get some changes from higher management. As he began to assume leadership, therefore, the program became molded more toward his own intents--somewhat away from stress-strain notions as conceptualized by the program and toward his organizational problems (again, in the opinion of the TA). Toward the end of the program, several times he substituted his own agenda for the one suggested by the program staff. If nothing else, this was a stellar example of taking on ownership of and responsibility for the group's activities during the course of the program.

As mentioned above, the only stress areas directly addressed by the group were Role Ambiguity and Quantitative Work Load. No efforts were directed at Participation or interpersonal relations areas, and individual P-E fit was not attended to.

As indicated in the meeting summaries and alluded to above, these men had severe organizational problems. They had responsibility for coordinating the work among several areas around them in the organization, yet they were not high enough in the hierarchy to be able to direct people in these several areas to do anything. If work did not get done by others, they had to do it themselves. Early in the program they proposed solutions aimed at securing the authority to deal with this problem and were turned down completely by higher management. This experience severely affected their motivation to attempt to solve their problems, which was low to begin with. Continued efforts in this area resulted in further frustration. Absenteeism became a problem in the program meetings. The group "hobbled home" at the end of the program with some largely unsuccessful

efforts directed at Quantitative Work Load.

It is not difficult to speculate upon the experience of the program for these men. It seems they felt fairly pessimistic to begin with about possibilities for their being able to implement any solutions to the problems they saw. This was confirmed in their first attempt. They saw the possibility for, and indeed to a great extent the responsibility for, these changes as residing in higher management. As the program continued and their frustration heightened, many of them began avoiding the meetings. The supervisor tried to turn to areas for change that were within the group's control in a genuine attempt to generate a success experience, but this too, met with little identifiable accomplishment. It seems entirely possible that the general program outcomes served only to exacerbate the stresses perceived by these men, particularly in the areas of Role Ambiguity and Quantitative Work Load.

Conclusion

In concluding this chapter, it may be useful to point out several similarities evident among the pictures just presented, and a few differences also.

First, in most cases only two stress areas, out of a possible nine, were directly addressed by a group during the course of the program. Of those stress areas touched upon by the groups, Role Ambiguity and Quantitative Work Load seemed particularly "popular." Concerted efforts at improving Participation were conspicuously absent. Also absent, in general, were efforts to improve the P-E fit of individuals. This may have been due in part to the fact that most groups never identified (for group information and use) the individual

data that was fed back to them with each individual to whom the data "belonged." Recall, from Chapter 3, that each person's data were identified only by a code number. Without knowing what one another's data "looked like," a base was lacking from which to work to improve individual P-E fit. At any rate, most efforts were directed at working on problems of "the group."

Some commonalities also can be seen in the participants' views of the most and least satisfying aspects of the program, and in the changes they would recommend. Many people cited, as the most satisfying aspects, the identification and sharing of problems, and the increased acquaintance of group members. The least satisfying aspects often were the perceived inability to solve certain problems the group attacked. Involving higher management in the program was probably the change most often recommended by the participants. Having a program of longer duration also was often cited.

Besides the similarities just discussed, some differences also are evident. On the one hand, three groups (A, B, and F) tackled a particular problem area early and stayed with it for five or six meetings. The other groups (C, D, and E) touched early problems more lightly and went on to other problem areas. Groups B and F also stand out as having distinct and severe failure experiences at the implementation stage--Group B through its fear of implementing a solution to a severely stressful problem and Group F through having its attempts at implementation soundly turned down. In both instances, the actions involved or would have involved persons external to the group. Most of the success experiences, however mild, in the other groups involved decisions to take action over which they had control.

In the results sections, we shall see whether aspects of the preceding pictures are consonant with the data analyses testing the effects of the program on stresses and strains.

CHAPTER 6

RESULTS

In this chapter we shall present results of analyses investigating the effects of the program on stresses and strains. This will be followed by exploratory analyses attempting to ascertain causal connections between the goodness of fit of what a person has and what he wants in his job (with respect to the several stress areas) and the strains measured in this study.

As was mentioned at the end of Chapter 2, the primary method used to examine "treatment" effects was analysis of covariance. This analysis adjusts treatment means to take into account scores on a covariate, i.e., to remove one source of experimental error. In the results to be described here, scores at Time 2 and at Time 3 for each stress and strain variable have been adjusted by each variable's Time 1 value (the covariate) so that, statistically, each group in the analysis "started at the same point." An example may help the reader understand this procedure.

In this study, one set of individuals (the Experimentals) received a treatment (the program), while another set (the Controls) did not. Among other results, we wish to see whether the treatment had any effect on job satisfaction; i.e., whether there is a significant difference between the two groups after the treatment. To the extent that the two groups, before the program began, differed from one another in their level of job satisfaction, we might be

misled into attributing a post-program difference to the effect of the program itself, rather than to the fact that the groups already were different in this respect before the program. And so the analysis of covariance removes this source of possible error.

All stress and strain variables have been analyzed in this manner; i.e., all Time 2 and Time 3 scores have been adjusted to take into account the score on that variable at Time 1, before the program began.¹ Results for one stress area, interfacing, have been additionally adjusted. The reader may recall that persons in the study were asked not only how much stress they experienced in communicating with others in different areas within and without the organization, but also how much time they spent communicating with these others. In the analyses of interfacing stresses, scores have been adjusted to "equalize", between groups, both the amount of stress reported at Time 1 and the time spent communicating with persons in various areas. The covariate used to adjust for "time spent" was the respondents' reports of how much time they were spending at the time of post-program measurements. So in looking at differences in interfacing stresses at Time 2 and Time 3, one may assume, statistically, that the groups being compared had the same degree of stress at Time 1 and that they were spending the same amount of time, at Time 2 and Time 3, communicating with persons in the various areas.

Because all work groups did not follow an identical program, we have chosen to first examine each work group's data against that

¹Since the Controls' data were compared to several different groups, their adjusted means vary slightly from table to table in the results that follow.

of the Controls. Following these examinations, we shall take a further look at the overall results of the entire "Experimental group" vs. Controls. Since each work group participating in the program was not matched with a corresponding Control work group, data at Time 2 and Time 3 for each Experimental group is compared to data from the entire group of Controls. Data from the Controls represent our "best guess" of the state of affairs in other areas of the organization that did not take part in the program, so those data serve as the basis of comparison for each program group.

The procedure for examining each group's results will now be described. A table of results,² comparing each Experimental group to the Controls on all stress and strain measures at Time 2 and Time 3, is presented in the text. Significant differences found between the two groups are then examined and discussed. Finding the source of the difference sometimes required analyses beyond the initial analysis of covariance. For example, a significant difference between the two groups could have resulted from a change across time in either one group or the other. Where it was judged to have an enlightening effect on the presentation of results, the significance of cross-time changes within a group also is mentioned. These changes were assessed by means of paired t-tests of the difference between, say,

²In these tables, the scale directions are as follows: P-E fit measures--high score means good fit; Interfacing stresses--high score means high stress; Self Esteem and Job Satisfaction (intrinsic and extrinsic)--high score means high esteem or satisfaction; Job Satisfaction (content free)--high score mean low satisfaction; physiological strains are the actual medical determinations.

a group's job satisfaction at Time 1 and at Time 2. The paired t-test is used in this case because the two measures are related; i.e., they are the same group's score on the same variable at two points in time. In the case of results for P-E fit with respect to the job stresses, further analyses are sometimes cited. Recall that P-E fit scores were constructed from two components--"P" or what the person wanted in his job, and "E" or what the job environment provided or demanded. And so some P-E fit results could have been due to a change primarily in either the "P" or "E" component of the P-E fit score. Again, where paired t-tests of changes in these components seemed to shed some light on the final outcomes, these results are cited in the discussion.

Finally, an attempt is made to interpret the results in light of our documentation of what had occurred in the program. In the preceding chapter, we reviewed what stress areas were and were not worked on by various groups in the program, and with what seeming success. We also cited some commonalities and differences among the groups. We shortly shall see to what extent the results presented here agree with the pictures that emerged of each group and its program.

Before presenting the results, a general statement should be made about one characteristic of the P-E fit data. Such a statement might clarify the interpretation of some results. A primary purpose of the program was to improve P-E fit, whichever the direction of misfit. This was based on some findings of Caplan (1971), not directly tested in this study, of a U-shaped curve for some stress-

strain relationships; i.e., that either too much or too little of a particular stress was associated with high strain. In point of fact, the data from this study show that there was general agreement among participants about having either too much or too little of the particular stress areas we measured. With only two exceptions,³ all Experimental work groups and the Controls, at all three times of measurement, wanted less quantitative work load and role ambiguity than they had, and wanted more than they had of all the other areas measured as P-E fit. So for example, when in the sections that follow we speak of a group having poor fit with respect to Participation, it means they had less opportunity to participate than they wanted. When we speak of poor fit with respect to Role Ambiguity, it means having more role ambiguity than is wanted.

The Effects of the Program

Group A

Let us first look at the differences between this work group and the Controls at Time 2, immediately after the program (see Table 2 for Group A results). Members of this group, as compared to the Controls, reported poorer P-E fit with respect to both Quantitative and Qualitative Work Load, Responsibility for Persons, and Participation. They also reported more stress in communicating with other Branches in their Division.

The work load results are surprising. Recall from Chapter 4 that this group seemingly solved some problems (elimination of

³ Group C had slightly less quantitative workload than they wanted at Time 1; Group D had slightly greater qualitative work load than they wanted at Time 2.

Table 2

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Group A vs. Controls)

<u>P-E fit Measures</u>		Exp.	Control	sig.
		Mean	Mean	
Quantitative Work Load	Time 2	4.26	4.60	.02
	Time 3	4.52	4.57	ns
Qualitative Work Load	Time 2	4.38	4.66	.05
	Time 3	4.79	4.66	ns
Responsibility for Persons	Time 2	3.73	4.32	.008
	Time 3	3.69	4.27	.02
Responsibility for Things	Time 2	4.34	4.57	ns
	Time 3	4.37	4.45	ns
Role Ambiguity	Time 2	4.24	4.44	ns
	Time 3	4.26	4.30	ns
Peer Relations	Time 2	4.24	4.28	ns
	Time 3	3.92	4.30	ns
Superior Relations	Time 2	4.16	4.33	ns
	Time 3	4.16	4.17	ns
Participation	Time 2	3.69	4.34	.0007
	Time 3	3.76	4.34	.01
<u>Interfacing Measures</u>				
Branch level	Time 2	1.87	1.85	ns
	Time 3	2.11	1.79	ns
Division level	Time 2	2.64	1.80	.005
	Time 3	2.63	1.65	.001
Directorate level	Time 2	2.06	1.73	ns
	Time 3	1.58	1.63	ns
Organization level	Time 2	2.04	1.79	ns
	Time 3	1.93	1.72	ns
External level	Time 2	2.17	1.75	ns
	Time 3	2.00	1.76	ns

Table 2 (continued)

<u>Strains</u>		<u>Exp. Mean</u>	<u>Control Mean</u>	<u>sig.</u>
Self Esteem	Time 2	6.70	6.91	ns
	Time 3	6.19	6.66	ns
Job Satisfaction (content-free)	Time 2	2.29	2.25	ns
	Time 3	2.51	2.26	ns
Job Satisfaction (extrinsic)	Time 2	3.15	3.33	ns
	Time 3	3.26	3.32	ns
Job Satisfaction (intrinsic)	Time 2	3.57	3.78	ns
	Time 3	3.31	3.68	.01
Systolic Blood Pressure	Time 2	120.4	120.9	ns
	Time 3	115.3	121.6	ns
Diastolic Blood Pressure	Time 2	81.2	76.3	ns
	Time 3	79.3	77.6	ns
Glucose	Time 2	109.6	94.7	ns
	Time 3	93.6	100.6	ns
Cholesterol	Time 2	199.7	214.7	ns
	Time 3	195.7	205.3	ns
Uric Acid	Time 2	5.93	5.57	ns
	Time 3	6.04	5.87	ns

unnecessary paperwork) that should have improved their fit with respect to work load, at least somewhat. Although a significant positive effect on work load might not have occurred, neither would one have expected a worsened fit for this group. These results are not explainable by a change in the Control group, since these measures changed only insignificantly for the Controls. It is possible that these results may be attributable simply to having the extra work load of the weekly program meetings, since the effects disappeared at Time 3. To investigate this, a single item--"The amount of time you spend in meetings"--was analyzed for Time 2 using the same covariance technique. Results showed that this group did spend somewhat more time in meetings ($p=.15$) than did the Controls. Further inspection of these data showed, in fact, that all of the increase in Quantitative Work Load for Group A was accounted for by the perception of increased time spent in meetings.

The results at Time 2 concerning Responsibility for Persons also are difficult to explain. This stress area was not worked upon by the group. We can rule out an effect due to changes in the Controls, since such changes were insignificant (from 4.30 at Time 1 to 4.38 at Time 2, $p=.38$). Perhaps the only key lies in a comment by one of the men, during the course of a program meeting, that they would like more responsibility for people but that seemed to be impossible to get. This is reflected in the "p" component of the P-E fit measure, which increased significantly ($p<.05$) from Time 1 to Time 2 for this group. In other words, these men increased their desire for responsibility for persons, and their P-E fit worsened accordingly. At Time 3, their P-E fit in this stress area

also was poorer than that of the Controls. This seems to be mainly accounted for by the difference at Time 2, since the continued decline of their fit from Time 2 to Time 3 was not significant ($p=.49$). The overall decline from Time 1 to Time 3 was quite significant ($p<.02$).

P-E fit with respect to Participation also was significantly worse for this group, compared to the Controls. These results held at both Time 2 and Time 3. Both results seem attributable to effects during the Time 1 → Time 2 interval, since no changes occurred for either this group or the Controls between Time 2 and Time 3. The large effect at Time 2 seems largely due to changes in this group, and to a lesser extent to changes in the opposite direction for Controls. During the program, fit with respect to Participation worsened significantly for this group ($p<.02$). During the same time, it improved somewhat for the Controls ($p=.08$). The decline for this group was due entirely to a decrease in the amount of participation they reported having ($p<.02$), and not at all to the amount they wanted ($p=.95$). What could have accounted for this decline in the participation these men were allowed in the decision-making affecting their jobs? Our documentation suggests only one possibility--a change in supervisor. This group's supervisor retired two weeks into the program. He was replaced by an acting supervisor who in turn was replaced near the end of the program. While we have no proof, it seems at least plausible that these supervisors had different leadership styles that included substantial differences in the amount of participation they allowed their subordinates.

It is again difficult to interpret the reason for the greater stress reported by these men in interfacing with other Branches in

their Division. We have no documented evidence to support a speculation. The increased difference between this group and the Controls at Time 3 is due in part to a decrease in stress reported by the Controls at Time 3 ($p \neq .06$).

The program seems to have had virtually no effect on the strains experienced by these men, as compared to the Controls. In only one instance--intrinsic job satisfaction at Time 3--is there a difference, (Group A was less satisfied, $p < .01$). Given the large number of insignificant results, this may have been due to chance.

In summary, these data results seem to be in general accord with the picture of this group presented in Chapter 5. As suggested there, few changes arose in this group. Their minimal problem-solving accomplishments apparently had little effect, and a change of supervisors, not connected with the program efforts, may have had a deleterious effect on at least one stress--Participation. And in the last section of this chapter, we shall present results suggesting the important influences of Participation on other measures of stress.

Group B

The program seems to have had some immediate effects on Group B, but few long-lasting ones. At Time 2, members of this group reported poorer fit than the Controls with respect to Quantitative Work Load, Responsibility for Persons, Role Ambiguity, and Participation (see Table 3). The difference in fit for Participation continued at Time 3. They also reported, at Time 2, greater stress than did the Controls in communicating with other Branches or offices in their Division, and with other Divisions in their Directorate.

The source of the difference at Time 2 between this group and the Controls with respect to Quantitative Work Load is difficult to pin down in the data. It seems to have resulted from a decrease (though not significant) from Time 1 to Time 2 in the amount of work load this group wanted (the "P" component). However, the group recovered from this worsening of fit by Time 3 to the extent that its P-E fit was as good as that of the Controls. In fact, the gain in fit for this group from Time 2 to Time 3 was significant ($p < .05$), and this was accounted for mainly by a decrease in the amount of work load they reported having ($p < .04$). Although there is no documentation during the Time 2 - Time 3 interval, it is possible that this improvement was due to the plan for work load relief developed during the program (see Chapter 4).

The poorer fit on Responsibility for Persons reported by these men at Time 2 relative to the Controls was accounted for by their own worsening of fit during the program ($p < .04$). This stress area was never treated by the group in the program, and the documentation suggests little in the way of explanation. It is possible however, that it was influenced by their relatively poor fit on Participation, as is suggested by results in the final section of this chapter.

The most dramatic difference between this group and the Controls is found in the area of Role Ambiguity. While the Controls showed some improvement in fit during the time of the program ($p < .08$), the worsening of fit for this group was more extreme ($p < .02$). This result seems directly attributable to the group's traumatic experiences in working on Role Ambiguity (see Chapter 4). As a result of these experiences, at Time 2 they both had more

Table 3

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Group B vs. Controls)

<u>P-E fit Measures</u>		<u>Exp. Mean</u>	<u>Control Mean</u>	<u>sig.</u>
Quantitative Work Load	Time 2	4.39	4.59	.05
	Time 3	4.57	4.56	ns
Qualitative Work Load	Time 2	4.63	4.65	ns
	Time 3	4.59	4.65	ns
Responsibility for Persons	Time 2	3.95	4.38	.02
	Time 3	3.96	4.34	ns
Responsibility for Things	Time 2	4.45	4.58	ns
	Time 3	4.33	4.46	ns
Role Ambiguity	Time 2	3.76	4.43	.0005
	Time 3	3.97	4.28	ns
Peer Relations	Time 2	4.04	4.31	ns
	Time 3	4.14	4.32	ns
Superior Relations	Time 2	4.32	4.37	ns
	Time 3	4.19	4.20	ns
Participation	Time 2	3.88	4.31	.02
	Time 3	3.85	4.32	.04
<u>Interfacing measures</u>				
Branch level	Time 2	2.02	1.81	ns
	Time 3	2.08	1.73	ns
Division level	Time 2	2.42	1.93	.04
	Time 3	1.81	1.80	ns
Directorate level	Time 2	2.54	1.78	.02
	Time 3	1.73	1.74	ns
Organization level	Time 2	1.85	1.78	ns
	Time 3	1.92	1.73	ns
External level	Time 2	1.90	1.70	ns
	Time 3	2.01	1.69	ns

Table 3 (continued)

<u>Strains</u>		<u>Exp.</u> <u>Mean</u>	<u>Control</u> <u>Mean</u>	<u>sig.</u>
Self Esteem	Time 2	6.58	6.93	ns
	Time 3	6.62	6.67	ns
Job Satisfaction (content-free)	Time 2	2.56	2.29	ns
	Time 3	2.56	2.24	.04
Job Satisfaction (extrinsic)	Time 2	3.20	3.29	ns
	Time 3	3.30	3.38	ns
Job Satisfaction (intrinsic)	Time 2	3.66	3.82	ns
	Time 3	3.57	3.72	ns
Systolic blood pressure	Time 2	124.1	122.6	ns
	Time 3	121.0	122.9	ns
Diastolic blood pressure	Time 2	78.4	77.8	ns
	Time 3	78.9	78.4	ns
Glucose	Time 2	101.0	94.7	ns
	Time 3	96.6	100.8	ns
Cholesterol	Time 2	217.4	223.2	ns
	Time 3	219.5	211.7	ns
Uric Acid	Time 2	6.11	5.56	.03
	Time 3	6.47	5.84	.04

ambiguity ($p = .08$) and wanted somewhat less of it ($p = .16$) than at Time 1. Although it is unlikely that they solved these stressful problems, fortunately they did recover somewhat by Time 3, improving their P-E fit from that of Time 2 ($p = .07$).

Improvements in P-E fit by the Controls account in part for the finding that Group B reported poorer fit with respect to Participation at both Time 2 and Time 3. In addition there was a steady decline in the amount of participation this group reported ($p = .19$, Time 1 → Time 3). One can find a hint of this lessening participation in an anecdote of the supervisor's actions reducing participation in decisions on contracted support, found in Chapter 5.

At Time 2, this group also reported greater stress than did the Controls in communicating within their Division and also with other Divisions in their Directorate. One must speculate that the first finding is, at least in part, tied to their difficulties regarding the Role Ambiguity problem. The person central to those problems, whom they would not confront, held an office in their Division. It is possible that, in trying to come to grips with the problem, their perceived stress regarding that person was raised. Again fortunately, this stress was lowered by Time 3 ($p < .02$). Regarding interfacing within the Directorate, no evidence is available to explain the difference between the stress reported by this group and that of the Controls (although one should note that the chain of command to the Directorate included the "problem person" at the Division level).

The program appears to have been associated with few differences in strains between this group and the Controls. This group was

somewhat more dissatisfied with their jobs, and this may be tied to the changes in the Participation measure. Caplan (1971) found that persons with poor P-E fit in this area, especially those with less participation than they desire, report lower job satisfaction. This group also showed higher uric acid levels, but this seems to be mainly attributable to decreasing uric acid in the Controls ($p < .02$). The change in uric acid level for members of this group was not significant ($p = .46$).

Overall, this group seems to have not done well in the program. The most striking failure was in the area of Role Ambiguity, although in this and other areas, there was a recovery by Time 3. Some efforts near the end of the program to decrease their work load may have paid off in the long run, as suggested by the group's improvement on this variable between Time 2 and Time 3 ($p < .04$). Participation seems to have been gradually decreasing, although this cannot be tied in as a program result. This decrease may also have contributed to decreased job satisfaction reported by the members of the group.

Group C

Table 4 indicates there were few effects at either Time 2 or Time 3 for this group, compared to the Controls. Still fewer seem attributable to program efforts. Results do show that this group reported significantly better P-E fit at Time 2 with respect to Qualitative Work Load than did the Controls. This difference seems to have arisen primarily from an increase in the "E" component for these men between Time 1 and Time 2 ($p = .17$). Since they were reporting a desire for more Qualitative Work Load than they had, this resulted in improved P-E fit. But the documentation suggests

nothing about the program itself that might have brought about this change. It seems likely that this resulted from work demands not connected with or affected by the program. This explanation is given credence by several other findings. Their Quantitative Work Load also went up somewhat ($p=.19$) at this time (fit improved very slightly, $p=.66$). They also were spending more time communicating with persons at Goddard outside their own Directorate ($p=.20$). At the same time they reported significantly more stress than did the Controls in interfacing with these people and also with people outside of Goddard. So the general picture seems to be one of an increased work load for these men (resulting in some improvement in fit), accompanied by increased time spent interfacing with persons elsewhere at Goddard, along with experiencing more stress than the Controls in interfacing with people there and also outside of Goddard.

A more interesting effect is shown in the area of stress created by interfacing with persons in other Branches or offices of their Division. At Time 2, these men reported significantly more stress than did the Controls in this interfacing area, while at Time 3 they reported significantly less. Since the means have been adjusted for the amount of time spent interfacing in this area, it is not likely that these results could be due simply to one group spending less time interfacing than did another, thus giving them less stress. Given our limited documentation, an interpretation can be advanced. Recall from accounts in Chapters 4 and 5 that this group wanted a better relationship with the next-level supervisor, and decided to begin holding regular meetings with him. It is possible that, if this increased contact and exposure took place (between Time 2 and

Table 4

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Group C vs. Controls)

<u>P-E fit Measures</u>		<u>Exp. Mean</u>	<u>Control Mean</u>	<u>sig.</u>
Quantitative Work Load	Time 2	4.62	4.61	ns
	Time 3	4.66	4.57	ns
Qualitative Work Load	Time 2	4.95	4.64	.05
	Time 3	4.80	4.65	ns
Responsibility for Persons	Time 2	4.56	4.33	ns
	Time 3	4.24	4.30	ns
Responsibility for Things	Time 2	4.57	4.54	ns
	Time 3	4.26	4.43	ns
Role Ambiguity	Time 2	4.41	4.43	ns
	Time 3	4.26	4.27	ns
Peer Relations	Time 2	4.32	4.28	ns
	Time 3	4.67	4.31	ns
Superior Relations	Time 2	3.91	4.28	ns
	Time 3	3.81	4.12	ns
Participation	Time 2	4.16	4.29	ns
	Time 3	4.13	4.31	ns
<u>Interfacing Measures</u>				
Branch level	Time 2	1.76	1.81	ns
	Time 3	2.47	1.69	ns
Division level	Time 2	2.38	1.81	.05
	Time 3	1.08	1.65	.05
Directorate level ¹	Time 2	2.63	1.82	.04
	Time 3	2.43	1.74	ns
External level	Time 2	2.77	1.72	.007
	Time 3	1.98	1.73	ns

¹These data are not reported, since only one person in this group spent time communicating with others at this level of the organization.

Table 4 (continued)

<u>Strains</u>		<u>Exp.</u> <u>Mean</u>	<u>Control</u> <u>Mean</u>	<u>sig.</u>
Self Esteem	Time 2	6.88	6.83	ns
	Time 3	6.34	6.54	ns
Job Satisfaction (content-free)	Time 2	2.43	2.35	ns
	Time 3	2.65	2.29	ns
Job Satisfaction (extrinsic)	Time 2	3.17	3.29	ns
	Time 3	3.14	3.26	ns
Job Satisfaction (intrinsic)	Time 2	4.06	3.80	ns
	Time 3	3.77	3.67	ns
Systolic blood pressure	Time 2	118.8	121.3	ns
	Time 3	120.0	121.8	ns
Diastolic blood pressure	Time 2	76.3	76.5	ns
	Time 3	76.7	77.9	ns
Glucose	Time 2	103.4	94.7	ns
	Time 3	96.2	101.1	ns
Cholesterol	Time 2	206.1	221.8	ns
	Time 3	186.6	210.2	ns
Uric Acid	Time 2	6.30	5.54	.02
	Time 3	5.41	5.82	ns

Time 3, for which we have no documentation), these men's perceptions of their stress could have dropped considerably by Time 3, which indeed seems to be the case.

The indication that this group was no better than the Controls in either participation or interpersonal relations areas is a disappointment, since they seem to have spent more time working on these areas than did any other group. The impressions about this group, found in Chapter 5, must have been accurate; i.e., any improvements in these areas were just beginning and without the program's support, they did not come fully to fruition.

Finally, there were no significant effects on strain, except for one difference between this group and the Controls (uric acid level at Time 2), which seems to be accounted for by a decrease in the Control group ($p < .02$) between Time 1 and Time 2.

Group D

The most marked effect in this group, compared to the Controls, was a better P-E fit with respect to Superior Relations (results in Table 5). It is difficult to attribute this, however, to benefits accruing from the program, since the members of this group received a new supervisor, through a reorganization (see Chapter 4), just after the program began. So at Time 1 they supplied data regarding their old supervisor (Group C's supervisor), while at Time 2 and Time 3 they were answering about their new supervisor. It seems that, by comparison, their new supervisor was better, although this perceived improvement-by-comparison wore off somewhat by Time 3. The following data substantiate this interpretation. The improvement

in P-E fit from Time 1 (under the old supervisor) to Time 2 (under the new one) was quite significant ($p < .0001$), but from Time 2 to Time 3 their fit worsened ($p < .05$). So overall they enjoyed significant improvement in fit with respect to Superior Relations from Time 1 to Time 3 ($p < .0003$), although this was probably attributable to characteristics of the new supervisor rather than to program efforts.

One must also wonder whether this perceived improvement will last. As was just mentioned, by Time 3 their fit had already declined ($p < .05$). In addition, one notices that at Time 3 their fit with respect to Participation was significantly worse than that of the Controls. From Time 2 to Time 3 (under the "new regime"), this fit decreased somewhat ($p = .16$), and this resulted from both a decrease in the participation they had ($p = .24$) and an increase in what they wanted ($p = .19$). So while we have no documentation to present, it seems questionable whether any apparent improvements were maintained.

Table 5 also shows some negative effects regarding several interfacing stresses. While we can offer no interpretations regarding specific interfacing stresses, a general picture emerged in Chapters 4 and 5 that seems consonant with these perceptions by the group. Group D did attempt to work on problems of interfacing. However, they came up with few solutions; those members with particular interfacing stress got little but sympathy. The TA reported "little success" in working on the problems. The men were pessimistic about being able to effect any changes. All in all, their exploration of this stress area perhaps did nothing but heighten their perceptions of the stress they experienced.

Table 5

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Group D vs. Controls)

<u>P-E fit Measures</u>		<u>Exp.</u> <u>Mean</u>	<u>Control</u> <u>Mean</u>	<u>sig.</u>
Quantitative Work Load	Time 2	4.64	4.62	ns
	Time 3	4.70	4.60	ns
Qualitative Work Load	Time 2	4.89	4.67	ns
	Time 3	4.91	4.66	ns
Responsibility for Persons	Time 2	4.80	4.39	ns
	Time 3	4.71	4.33	ns
Responsibility for Things	Time 2	4.56	4.57	ns
	Time 3	4.54	4.44	ns
Role Ambiguity	Time 2	4.18	4.44	ns
	Time 3	4.23	4.29	ns
Peer Relations	Time 2	4.68	4.26	ns
	Time 3	4.59	4.29	ns
Superior Relations	Time 2	5.10	4.32	.003
	Time 3	4.91	4.15	.006
Participation	Time 2	4.43	4.36	ns
	Time 3	3.74	4.36	.02
<u>Interfacing Measures</u>				
Branch level	Time 2	2.49	1.83	.05
	Time 3	1.90	1.74	ns
Division level	Time 2	2.13	1.77	ns
	Time 3	2.04	1.62	ns
Directorate level	Time 2	1.93	1.75	ns
	Time 3	1.85	1.63	ns
Organization level	Time 2	2.59	1.78	.04
	Time 3	2.37	1.72	ns
External level	Time 2	2.76	1.70	.006
	Time 3	2.67	1.68	.004

Table 5 (continued)

<u>Strains</u>		<u>Exp.</u> <u>Mean</u>	<u>Control</u> <u>Mean</u>	<u>sig.</u>
Self Esteem	Time 2	6.87	6.85	ns
	Time 3	6.27	6.56	ns
Job Satisfaction (content-free)	Time 2	2.10	2.29	ns
	Time 3	2.69	2.25	.04
Job Satisfaction (extrinsic)	Time 2	3.25	3.30	ns
	Time 3	3.06	3.28	ns
Job Satisfaction (intrinsic)	Time 2	3.88	3.82	ns
	Time 3	3.69	3.70	ns
Systolic blood pressure	Time 2	121.6	121.6	ns
	Time 3	125.8	122.2	ns
Diastolic blood pressure	Time 2	75.6	77.3	ns
	Time 3	73.3	78.2	ns
Glucose	Time 2	93.0	93.3	ns
	Time 3	100.0	100.0	ns
Cholesterol	Time 2	193.0	221.2	ns
	Time 3	221.8	210.6	ns
Uric Acid	Time 2	5.91	5.52	ns
	Time 3	5.79	5.78	ns

As has been the case for the other groups so far, virtually no effects on strains are evident. In only one instance (content-free job satisfaction at Time 3) is there a significant difference. Here this group is more dissatisfied than the Controls. This parallels the finding already reported for Group B, and may again be associated with their decreasing participation (Caplan, 1971). The later section describing overall results for all Experimentals supports this contention.

Group E

As Table 6 indicates, this group showed few differences from the Controls at either Time 2 or Time 3. It is at least a moderate success story for the program, however, since some of the differences are in the direction of better fit for this group, and some program efforts may account for these differences. Let us look at these now.

Members of Group E did not report significantly better fit than the Controls with respect to Quantitative Work Load at Time 2, but by Time 3 they did. This significant Time 3 difference is a result of a gradual improvement in fit for this group over the course of our measurements. Between Time 1 and Time 2 (during the course of the program), the group's fit improved moderately ($p = .19$) and moreso yet between Time 2 and Time 3 ($p = .08$). Their overall improvement between the first and last measurement was quite significant ($p < .02$). More importantly, the documentation suggests one reason at least for this improvement--the "cross-training" plan. Under this plan, just beginning as the program concluded, members of the group were to train one another to do others' jobs, so that no one would be "swamped" by work after an absence. Although we have no documentation to indicate,

Table 6

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Group E vs. Controls)

<u>P-E fit Measures</u>		Exp. Mean	Control Mean	sig.
Quantitative Work Load	Time 2	4.66	4.59	ns
	Time 3	4.87	4.57	.009
Qualitative Work Load	Time 2	4.76	4.63	ns
	Time 3	4.79	4.63	ns
Responsibility for Persons	Time 2	4.08	4.36	ns
	Time 3	4.09	4.31	ns
Responsibility for Things	Time 2	4.24	4.01	.01
	Time 3	4.30	4.48	ns
Role Ambiguity	Time 2	4.75	4.43	ns
	Time 3	4.74	4.27	.03
Peer Relations	Time 2	4.47	4.27	ns
	Time 3	4.54	4.30	ns
Superior Relations	Time 2	4.39	4.39	ns
	Time 3	4.42	4.22	ns
Participation	Time 2	4.34	4.36	ns
	Time 3	4.26	4.36	ns
<u>Interfacing Measures</u>				
Branch level	Time 2	1.42	1.89	ns
	Time 3	1.28	1.84	ns
Division level	Time 2	1.76	1.84	ns
	Time 3	1.63	1.69	ns
Directorate level	Time 2	1.89	1.81	ns
	Time 3	2.08	1.69	ns
Organization level	Time 2	1.59	1.74	ns
	Time 3	1.59	1.68	ns
External level	Time 2	2.31	1.80	ns
	Time 3	3.30	1.83	.006

Table 6 (continued)

<u>Strains</u>		<u>Exp. Mean</u>	<u>Control Mean</u>	<u>sig.</u>
Self Esteem	Time 2	6.58	6.90	ns
	Time 3	6.95	6.62	ns
Job Satisfaction (content-free)	Time 2	2.24	2.36	ns
	Time 3	2.32	2.31	ns
Job Satisfaction (extrinsic)	Time 2	3.09	3.26	ns
	Time 3	3.20	3.24	ns
Job Satisfaction (intrinsic)	Time 2	3.85	3.79	ns
	Time 3	3.97	3.67	.02
Systolic blood pressure	Time 2	121.1	122.6	ns
	Time 3	119.7	123.1	ns
Diastolic blood pressure	Time 2	77.9	77.1	ns
	Time 3	76.6	78.1	ns
Glucose	Time 2	95.6	94.9	ns
	Time 3	101.7	100.8	ns
Cholesterol	Time 2	218.7	216.8	ns
	Time 3	205.4	207.5	ns
Uric Acid	Time 2	5.93	5.49	ns
	Time 3	6.20	5.75	ns

one way or the other, if the training plan was carried out successfully, it is the only evidence we have to offer as explanation for this superiority of fit for Group E, relative to the Controls.

This group also displayed better fit than the Controls with respect to Role Ambiguity at Time 3, although this finding needs further scrutiny to identify its source. Two elements combined to generate this result. First, the level of Group E's score is actually the result of a significant improvement ($p < .05$) between Time 1 and Time 2, which was maintained at Time 3. Second, the significant difference between this group and the Controls at Time 3 emerged through a decline for the Controls from Time 2 to Time 3 ($p < .04$). So the final interpretation is that this group improved its fit significantly during the program, maintained that improved level at Time 3, and this level achieved significance ($p < .03$) over the Controls' score at Time 3 via a decline in the fit reported by Controls. Since the Time 2 adjusted mean difference was near significance ($p = .08$), it seems justified to attribute a fair amount of the ultimate finding to the improvement of this group. Two possibilities suggest themselves to account for this improvement. The first, and more tenuous, is the work on Role Ambiguity done by the group early in the program. The tenuousness arises from the fact that we have no record of what actually was accomplished in that work. Second, and more concrete, is the increased contact between "group leaders" and members that occurred as a result of program discussion and decision to increase that contact (see Chapter 5). It seems entirely plausible that this increased contact would leave the group members in positions either of less ambiguity or of being better able to deal with the

ambiguities that did exist.

Moving on to other results, we find that this group reported significantly worse fit than the Controls with respect to Responsibility for Things at Time 2. Since this group's data shows no significant changes in this area during our period of measurement, we must turn to the Controls' data, and here we find the source of the difference. The Controls reported improved fit between Time 1 and Time 2 ($p < .001$), which generated the difference seen in Table 6. Their fit then worsened at Time 3 ($p < .03$), and the difference disappeared. We have no documentation of activities in the Control work groups to suggest a reason for these changes.

At Time 3 this group also reported significantly more stress in interfacing with persons outside of Goddard (contractors, etc.). Part of this result may be accounted for by a lessening of stress reported by the Controls ($p < .01$, Time 1 → Time 3). But there are other data, both "hard" and "soft", that attribute some of this difference to occurrences in Group E. This group did report some increase in this stress from Time 2 to Time 3 ($p = .17$). In fact, this very stress area had been explored during the program. Accounts in Chapter 4 of this group's meetings show that parts of four meetings were taken up in discussion of this problem, with no discernible results. And in the ninth meeting, the group listed one of its needs as being able to solve not-yet-solved interface problems. It is apparent that external interface problems continued to plague this group.

Finally, we see that here, as in other groups, virtually no effects on strains resulted. Only one out of the 18 results cited is significant beyond the .05 level. One out of 20 could be expected

by chance alone.

Group F

Group F represents one of the greatest failures of the program to assist a group in dealing with its problems. Several effects of worse fit and higher stress, compared to the Controls, are evident in Table 7. These all seem to tie into the main problem confronted by this group during the program, so let us review that problem briefly, as stated in Chapter 5.

. . . these men had severe organizational problems. They had responsibility for coordinating the work among several areas around them in the organization, yet they were not high enough in the hierarchy to direct people in these several areas to do anything. If work did not get done by others, they had to do it themselves. Early in the program they proposed solutions aimed at securing the authority to deal with the problem and were turned down completely by higher management. This experience severely affected their motivation to attempt to solve their problems, which was low to begin with. Continued efforts in the area resulted in further frustration. Absenteeism became a problem in the program meetings. The group "hobbled home" at the end of the program with some largely unsuccessful efforts directed at Quantitative Work Load.

With the exception of the result regarding Responsibility for Things, which is due to a change in the Controls ($p < .001$), all the significant effects for stresses found in Table 7 seem interpretable within the framework of the above problem. First, the failure at solving this general problem of Role Ambiguity only exacerbated the problem in the eyes of these men (Group F worse than Controls, $p < .0003$ at Time 2). Their solutions to the problem were dismissed by management at the Directorate level (Group F reports more interfacing stress than Controls at this level, $p < .008$ at Time 2). They

Table 7

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Group F vs. Controls)

<u>P-E fit Measures</u>		<u>Exp. Mean</u>	<u>Control Mean</u>	<u>sig.</u>
Quantitative Work Load	Time 2	4.40	4.59	.05
	Time 3	4.13	4.56	.0002
Qualitative Work Load	Time 2	4.45	4.67	ns
	Time 3	4.59	4.66	ns
Responsibility for Persons	Time 2	4.06	4.37	ns
	Time 3	4.21	4.32	ns
Responsibility for Things	Time 2	4.21	4.65	.02
	Time 3	4.53	4.49	ns
Role Ambiguity	Time 2	3.69	4.41	.0003
	Time 3	3.94	4.25	ns
Peer Relations	Time 2	4.35	4.29	ns
	Time 3	4.29	4.33	ns
Superior Relations	Time 2	4.38	4.41	ns
	Time 3	4.34	4.24	ns
Participation	Time 2	4.09	4.29	ns
	Time 3	4.13	4.30	ns
<u>Interfacing Measures</u>				
Branch level	Time 2	2.14	1.73	ns
	Time 3	2.09	1.68	ns
Division level	Time 2	2.21	1.74	.02
	Time 3	2.08	1.60	.04
Directorate level	Time 2	2.90	1.93	.008
	Time 3	2.47	1.29	ns
Organization level	Time 2	2.23	1.80	ns
	Time 3	2.44	1.76	.03
External level	Time 2	1.59	1.70	ns
	Time 3	1.45	1.66	ns

Table 7 (continued)

<u>Strains</u>		Exp. Mean	Control Mean	sig.
Self Esteem	Time 2	6.04	6.87	.0008
	Time 3	6.24	6.60	ns
Job Satisfaction (content-free)	Time 2	2.74	2.28	.005
	Time 3	2.73	2.24	.001
Job Satisfaction (extrinsic)	Time 2	3.25	3.27	ns
	Time 3	3.14	3.25	ns
Job Satisfaction (intrinsic)	Time 2	3.55	3.85	.02
	Time 3	3.72	3.73	ns
Systolic blood pressure	Time 2	126.1	121.6	ns
	Time 3	120.8	122.3	ns
Diastolic blood pressure	Time 2	81.2	76.6	ns
	Time 3	80.7	77.6	ns
Glucose	Time 2	94.1	94.3	ns
	Time 3	100.4	99.9	ns
Cholesterol	Time 2	212.0	221.8	ns
	Time 3	211.6	213.3	ns
Uric Acid	Time 2	5.93	5.49	ns
	Time 3	5.20	5.75	ns

had to continue to follow the same "up, across, and down" chain of command to reach the men elsewhere in the organization for whose work they were responsible (Group F reports more stress than Controls in interfacing within their Division, their Directorate, and other parts of Goddard--see Table 7). And finally, these men were left responsible for doing the work of others if that work was not done by the others, and, furthermore, were unsuccessful in attempting to deal with other problems of Quantitative Work Load (Group F reports poorer fit than Controls with respect to Quantitative Work Load, $p < .05$ at Time 2, $p < .0002$ at Time 3). This interdependent and all-encompassing explanation of the findings for this group seems compelling and inescapable.

Apparently this pervasive problem, in which these men "had their noses rubbed" during the program, also affected their psychological strains, especially as measured at the conclusion of the program. On two of the three measures of job satisfaction, they were significantly less satisfied than the Controls ($p < .005$, $p < .02$). They also were experiencing lower self esteem ($p < .0008$). Their general (content-free) job satisfaction continued to be lower than that of the Controls at Time 3 ($p < .001$). Although many of the effects seem to have dissipated by Time 3, one must regret the inadequacy of the program or other resources to solve this group's most stressful problem.

Total Experimental Group

Having reviewed the results for each work group that took part in the program, compared to the Controls, let us now turn to overall results for all six work groups (Experimentals), compared to the

Controls. Obviously, most of the results contained here are due simply to the combining of the various results for each work group. But in looking at the overall results, we wish to go beyond the combination of specific work group results that yielded the overall result, to discuss aspects of the program in general that led to these outcomes. This will tie directly in to the next chapter, in which we shall discuss the implications of this study for designing and implementing future projects of this kind. Each stress and strain will be discussed in turn. All these results are included in Table 8.

Quantitative Work Load. At the close of the intervention program (Time 2), those who had taken part in the program reported significantly worse fit with respect to this variable than did the Controls. By Time 3, the two groups were virtually equal in their fit. The significant difference at Time 2 resulted primarily from an increase in the amount of work load ("E" component) reported by the Experimentals from Time 1 to Time 2 ($p=.09$). An obvious explanation for this increase is the fact that a weekly two-hour program meeting was added to the work load of the Experimentals, to be reflected in the Time 2 measure. Analysis of a single item, "the amount of time you spend in meetings," suggests this may indeed be the source of the difference. Controlling by covariance for the Time 1 measure of this item, at Time 2 Experimentals were spending more time in meetings ($p=.12$) than were Controls; the same analysis at Time 3 (three months after the program's completion) was far less significant ($p=.45$). So while, overall, the program did little to improve the fit of the participants with respect to this variable, neither did it worsen the fit, except insofar as it temporarily added

Table 8

Adjusted Means Showing Effects on Stresses and Strains
at Time 2 and Time 3 (Experimental vs. Controls)

<u>P-E fit Measures</u>		<u>Exp. Mean</u>	<u>Control Mean</u>	<u>sig.</u>
Quantitative Work Load	Time 2	4.41	4.57	.05
	Time 3	4.47	4.53	ns
Qualitative Work Load	Time 2	4.60	4.64	ns
	Time 3	4.69	4.64	ns
Responsibility for Persons	Time 2	4.08	4.30	ns
	Time 3	4.09	4.26	ns
Responsibility for Things	Time 2	4.38	4.59	.05
	Time 3	4.40	4.47	ns
Role Ambiguity	Time 2	4.12	4.42	.02
	Time 3	4.21	4.27	ns
Peer Relations	Time 2	4.41	4.36	ns
	Time 3	4.38	4.34	ns
Superior Relations	Time 2	4.35	4.36	ns
	Time 3	4.30	4.21	ns
Participation	Time 2	4.03	4.26	.03
	Time 3	3.98	4.29	.02
Subordinate Relations	Time 2	4.70	4.46	.05
	Time 3	4.61	4.34	ns
<u>Interfacing Measures</u>				
Branch level	Time 2	1.97	1.88	ns
	Time 3	2.07	1.78	ns
Division level	Time 2	2.31	1.89	.01
	Time 3	1.95	1.67	ns
Directorate level	Time 2	2.42	1.97	.03
	Time 3	2.04	1.91	ns
Organization level	Time 2	2.09	1.88	ns
	Time 3	2.09	1.83	ns
External level	Time 2	2.12	1.75	.05
	Time 3	2.10	1.78	ns

Table 8 (continued)

<u>Strains</u>		<u>Exp.</u> <u>Mean</u>	<u>Control</u> <u>Mean</u>	<u>sig.</u>
Self Esteem	Time 2	6.49	6.85	.03
	Time 3	6.43	6.58	ns
Job Satisfaction (content-free)	Time 2	2.53	2.37	ns
	Time 3	2.63	2.32	.002
Job Satisfaction (extrinsic)	Time 2	3.15	3.25	ns
	Time 3	3.17	3.24	ns
Job Satisfaction (intrinsic)	Time 2	3.69	3.79	ns
	Time 3	3.65	3.67	ns
Systolic blood pressure	Time 2	122.9	122.2	ns
	Time 3	120.5	122.8	ns
Diastolic blood pressure	Time 2	78.6	76.6	ns
	Time 3	78.0	77.9	ns
Glucose	Time 2	98.7	94.3	ns
	Time 3	98.3	100.3	ns
Cholesterol	Time 2	214.0	222.8	ns
	Time 3	211.5	212.8	ns
Uric Acid	Time 2	5.89	5.53	.04
	Time 3	6.05	5.79	ns

to their work load. Just by taking part in a program such as this, temporary elevation of work load is inevitable (unless one is excused from certain other duties). What is needed in the future is a problem-solving mechanism to more than offset this temporary increase. Discussion of these future possibilities is the subject matter of the next chapter.

Qualitative Work Load. As can be seen in Table 8, the Experimentals and the Controls did not differ from one another in their fit with respect to Qualitative Work Load. This is not surprising, since no work group directly addressed this stress area during the program. In addition, it seems that to effect changes in areas of work load, more than in any other areas, one would need to concentrate on the individual level. And rarely in this program did groups turn their attention to the problems of individual members.

Responsibility for Persons. In this area, too, no significant differences existed between Experimentals and Controls at either Time 2 or Time 3. Again, this is not surprising, since this area was never chosen for consideration by a work group.

Responsibility for Things. At Time 2, Experimentals reported significantly worse fit than did Controls with respect to the stress area. As has been cited in the previous work group results, however, this was due to changes occurring in the Control group. Among Controls, this variable increased significantly from Time 1 to Time 2 ($p < .001$). Then from Time 2 to Time 3, it decreased significantly ($p < .03$). Accordingly, the Time 3 difference between Experimentals and Controls is not significant. There was no documentation of events transpiring in the Control work groups, so we do not know the source of the changes.

Role Ambiguity. At the conclusion of the program, there was a significant difference ($p < .02$) between Experimentals and Controls on this variable. This was in the direction of Experimentals reporting poorer fit. The primary contributors to this poorness of fit were Groups B and F, who experienced clear failures during the program in attempting to solve problems of role ambiguity. By comparison, Group E experienced some success. If we think of role ambiguity as a state in which a person has inadequate information to perform his role in an organization (French & Caplan, 1972), and contrast the experiences of Groups B and D, it is easy to frame a contributory cause of these results. In examining this stress area, Group B chose deliberately to avoid involving that person who could best have provided the information and assistance crucial to alleviating their problems. On the other hand, Group E devised and implemented a plan that increased the contact and opportunities for flow of information to and from its members. They also called in a Personnel representative to provide them with information about a stressful situation (a possible RIF). In general, it seems that there was in the program not enough involvement of persons (usually higher management) who could have provided information and assistance to increase clarity of job expectations. This will be discussed further in the next chapter.

Interpersonal Relations. Included here are three stress areas measured in this study: Peer Relations, Superior Relations, and Subordinate Relations. The last is being reported for the first time here, since within each individual work group there was only one or at most a few persons with subordinates. Subordinate Relations data also were not fed back to the work groups, since some individuals'

(lone supervisors) data would then have been identified to others (see Chapter 3). Let us hold the Subordinate Relations data for a moment, then, and look at the other two interpersonal relations areas. In both cases, there were no differences between Experimentals and Controls at either Time 2 or Time 3. This is a clear disappointment, since interpersonal relations was a key area we hoped to improve in this study. But in retrospect it is not difficult to understand the results. First, few groups chose to treat directly these stress areas (see Chapters 4 and 5). This was their prerogative, given our decision to let each group direct the course of its own program. Second, and worth extra consideration because it applies to program efforts on other stresses as well, even when a group examined interpersonal relations, they never did so in a way that included specific, implementable plans to improve any identified problems or shortcomings. This is perhaps a key failure of the program in general. A discussion of some problem is at best a hit-or-miss means of changing it, without including a plan for change that is implementable and allows for later evaluation to judge its effects.

Let us look now briefly at Subordinate Relations. Here, in an area where participants received no feedback on which basis even to attempt improvements, Experimentals were significantly better than Controls at Time 2 ($p < .05$) and nearly so at Time 3 ($p = .09$). Perhaps just the added exposure of a supervisor to his men in the program forum generated these results. Further consideration of the Superior Relations data supports this contention. There was a steady decline in the quality of Superior Relations in the total sample during this study ($p < .001$, "E" component, Time 1 → Time 3). Although the

differences in Table 8 are not significant, this decline was much steeper for the Controls ($p < .0007$) than for the Experimentals ($p = .16$). While we cannot say with certainty what was causing this disenchantment of employees with their supervisors during this time (perhaps it was anxiety about another RIF), apparently the slide was arrested somewhat in the program groups. Considering both the Superior and Subordinate Relations data, it is possible that having the opportunity to discuss openly work problems helped to maintain some level of trust and cooperativeness in an otherwise unpleasant, uncertain environment.

Participation. Table 8 shows that, at both post-program measurements, Experimentals were reporting poorer fit than Controls with respect to Participation. A portion of these effects is attributable to an improvement reported by Controls from Time 1 to Time 2 ($p = .08$), which was maintained at Time 3 ($p = .11$, Time 1 \rightarrow Time 3). However, two aspects of the program itself should be considered as well, although we can only be speculative here. First, the participation offered by this program may have been seen by group members as only illusory, an attempt by management at psychological manipulation (French & Caplan, 1972). Recall, for example, that Group F, having been "invited" to participate in this program to reduce their stresses, promptly had all their proposals for stress-reduction "shot down" by upper-management. Second, we do not have any evidence (except through questionnaire data) of the actual participation these men were allowed in their everyday work. There may well have been no carryover from the highly-participative format of program meetings, so that, by comparison, Experimentals' perceptions of participation in the course of everyday work seemed even worse than it had before the program. The

Controls had no such glimpse at a different mode of operation.

Interfacing. Table 8 indicates that, at Time 2, Experimentals were reporting significantly more stress than were Controls in communicating with other Branches or offices in their Divisions, with other Divisions in their Directorates, and with persons external to Goddard (contractors, etc.). No other differences between Experimentals and Controls, with regard to Interfacing, were significant. The pattern of changes within Experimental and Control groups suggests two explanations, one for the differences seen at the Division and Directorate levels, and one for the differences at the External level. Let us look at each in turn.

In looking back on the program, we can say that groups encountered fairly quickly problems whose solutions necessitated cooperation from persons outside the group. We wish to suggest that the differences occurring at the Division and Directorate levels resulted from increased stress for program participants, caused by having to deal with, or at least face the necessity of dealing with, persons at these levels in the course of their program problem-solving activities. Recall, for example, Group F's experience in sending their proposals for change to higher-management, or Group B's anxiety and avoidance in having to confront a Division officer with regard to their role ambiguity problems. Among Experimentals, stress in interfacing with these two organization levels went up, though not significantly, from Time 1 to Time 2 ($p=.23$, $p=.19$). In the interval following the program, their stresses then went back down ($p < .008$, $p < .02$). No such pattern of changes exists for the Control group. And so it seems that an increase in stress for the Experimentals during the program

led to the Time 2 difference in Table 8, and a subsequent decline in the three months following the program led to an insignificant difference at Time 3.

Results regarding stress from contacts external to Goddard came from a different source. Overall, the Experimentals reported no changes in this stress during the period of our measurements. However, the Controls reported a lowering of stress during the time of the program ($p=.06$), and this trend continued at Time 3 so that their overall decline in stress, Time 1 to Time 3, was quite significant ($p < .01$). As has been stated before, we have no documentation to explain this decline in stress reported by the Controls. If this decline was characteristic in general of parts of the organization that were not engaged in the program, then all we can say is that perhaps something about program activities was acting to prevent this decline for the Experimental work groups. Little in the way of evidence can be advanced in explanation here. Group E, for example, did attempt without much success to work on external interface problems, and perhaps this called to the forefront of their attention continuing problems with these external groups, causing their perceptions of the stress level to be maintained. We offer no other guesses.

Strains. Since so few significant effects on strains are evidenced in Table 8, we shall discuss each of those in this single section. To summarize, Experimentals reported significantly lower self esteem at Time 2 and significantly lower job satisfaction (content-free) at Time 3 than did Controls. They also showed higher levels of uric acid at Time 2, compared to Controls.

It is at first a bit surprising to see the effect on self esteem

at Time 2. In his investigation of relationships between P-E fit and strains, Caplan (1971) reported no significant findings using self esteem as a measure of strain. But scrutiny of those same relationships in this study suggests why the Experimental group reported lower self esteem. Excepting Subordinate Relations, for which we have few respondents, the P-E fit variables that showed Experimental vs. Control differences at Time 2 were Quantitative Work Load, Responsibility for Things, Role Ambiguity, and Participation. The relationship at Time 2 between self esteem and the first of these four variables was negligible ($r = -.02$). But the relationships of self esteem with the other three were the strongest of all the P-E fit variables ($r = .29$, $p < .005$; $r = .31$, $p < .003$; $r = .33$, $p < .001$ respectively). Given these very strong relationships and the Experimentals' comparatively worse fit on these variables, the finding of lower self esteem is to be expected.

The finding that at Time 3 the Experimental group was significantly less satisfied than the Controls can be examined in a similar manner. Participation was the only P-E fit measure for which a significant difference was found at Time 3. Caplan (1971) found that persons reporting perfect fit with respect to Participation also reported the highest job satisfaction. And the comparable relationship in this study is striking: at Time 3 the correlation between P-E fit with respect to Participation and job satisfaction was $-.46$ ($p < .0001$, low score indicates high satisfaction). So in this study, having good fit on Participation accounted for nearly a quarter of the variance in level of job satisfaction. We shall try, in the next section, to go beyond cross-sectional relationships such as the one just

reported, and examine the predictive power of such measures to stresses and strains at later points in time.

The final stress effect seen in Table 8 is that Experimentals had significantly higher uric acid levels than did Controls at Time 2. One is tempted simply to assume that something about the program raised the uric acid levels of the participants. However, this effect seems to be mainly due to a lowering of uric acid among the Controls ($p < .02$) and not to a change among Experimentals ($p = .91$). Reference to some findings from past studies may help to explain this result. Kasl, Cobb & Brooks (1968), in a study of men who lost their jobs because of a permanent plant shutdown, found that anticipation of impending plant shutdown was associated with elevated uric acid. Uric acid levels dropped sharply if the man found quick reemployment. Since Goddard employees had undergone a RIF shortly before our first data collection, it is possible that their uric acid levels rose due to the threat of job loss. After that threat had passed ("reemployment"), their uric acid levels would have dropped. This indeed happened for the Controls. The reason for the continued elevation in the Experimentals may involve their participating in the program. Rahe et al. (1968) found significant elevations in uric acid levels when Navy Underwater Demolition Team trainees were "eagerly taking on arduous activities." The Experimentals' strivings to succeed in this program may have served to maintain their uric acid levels, while those of the Controls receded.

The Predictive Power of the P-E fit Measures¹

As mentioned at the end of Chapter 1, in this study we wanted

¹The writer gratefully acknowledges the help of Ray E. Faith in the analyses reported here.

some evidence that stresses were causes, not merely correlates, of strain. In this section the results of our efforts will be described. Although far from conclusive, we have found some evidence of causality, or perhaps more conservatively, of predictive power across time. We also have found some evidence of the important influence, on some other stresses, of having good fit with respect to Participation. The Interfacing stresses were not included in these analyses, since they were only single-item measures and were not measures of fit, as were the other stress measures. Also, there was some limitation to the number of variables that the analysis technique, as programmed, could incorporate.

The technique used here was developed by Ray E. Faith at the Institute for Social Research, The University of Michigan. It is an extension of multiple linear regression to the case in which data are collected from a fixed sample of individuals at two or more times. In this study we had three times of data collection, separated by three-month intervals. In applying this technique, the following assumptions are made: the degree of predictive power of one variable (at one time) to another (three months later) remains the same across our two three-month time intervals; the relationships among the variables are linear; and the variables are measured without error. Regarding the first assumption, although we cannot say conclusively, we have little reason to believe that the predictive powers of the stress measures should change very much from one time interval to the next. The second assumption is probably not violated, as far as we know. Caplan (1971) found that some relationships among stresses and strains are conditioned by measures such as participation or interpersonal relations. But here we are including (accounting

for) those measures in the relationships to be reported. The last assumption is an ideal surely not met here. The reader who wishes a quite technical explanation of the technique should refer to Faith (1973). We shall give a description sufficient to understand the results reported here.

This technique separates the relation between variables into two parts: a regression coefficient⁴ indicating the predictive power of one variable to another measured later in time, and a residual correlation of the two variables. Important aspects of each of the two parts should be mentioned. First, the squared value of the standardized regression coefficient indicates the proportion of variance in the predicted variable that is directly attributable to the predictor variable, after the effects of other predictor variables, including the earlier value of the predicted variable, have been taken into account. This gives the regression coefficient greater significance than usually would be given in a multiple regression model, since here the dependent (predicted) variable's earlier value is included as a predictor. Regarding the residual correlation, the degree of correlation indicates the extent to which there is some (linear) link between the two variables that is not accounted for by the model. This link may be due to "causal" influences operating over some other time lag than the one measured (here, three months), or it may be due to relationships with other variables not measured.

Let us now turn to the results of the analyses. We shall first

⁴These coefficients are standardized to eliminate the effects of differing scales of measurement.

look at the relationships among the stresses. As would be expected, for each variable the autoregressive coefficient (the prediction of a variable to itself, later in time) was the highest (ranging from .21 to .74, with only one falling below .34). Inspection of the remaining coefficients indicated that Participation stood out as having strong predictive power to the other variables. Figure 10 below shows these relationships. Only coefficients of .19 or higher are displayed in the figure. This was done for two reasons. First, coefficients below .20 account for less than 4% of the variance in the predicted variable, an amount quite small even considering that the predicted variable's earlier value was included as one of the predictors. Second, inclusion of lower values did not add to the clarity of the results, since no other variable showed the consistent strength of prediction that Participation did.

The implication is, then, that improving fit with respect to Participation should lead to improved fit with respect to several other stresses (and not the other way around). This supports one of the basic principles upon which the study was based--participation as a means of improving P-E fit--and is in general accord with findings from several earlier studies (e.g., Coch and French, 1948; French, Israel & Aas, 1960; French, Kay, & Meyer, 1966; Caplan, 1971). The additional prediction (of Responsibility for People to Responsibility for Things) is rather easy to understand, especially at Goddard. With all the projects and equipment handled by these men, it seems likely that taking on extra responsibility for persons would imply some responsibility also for the "things" managed by those persons. The reverse would not be true. If one assumed extra responsibility for

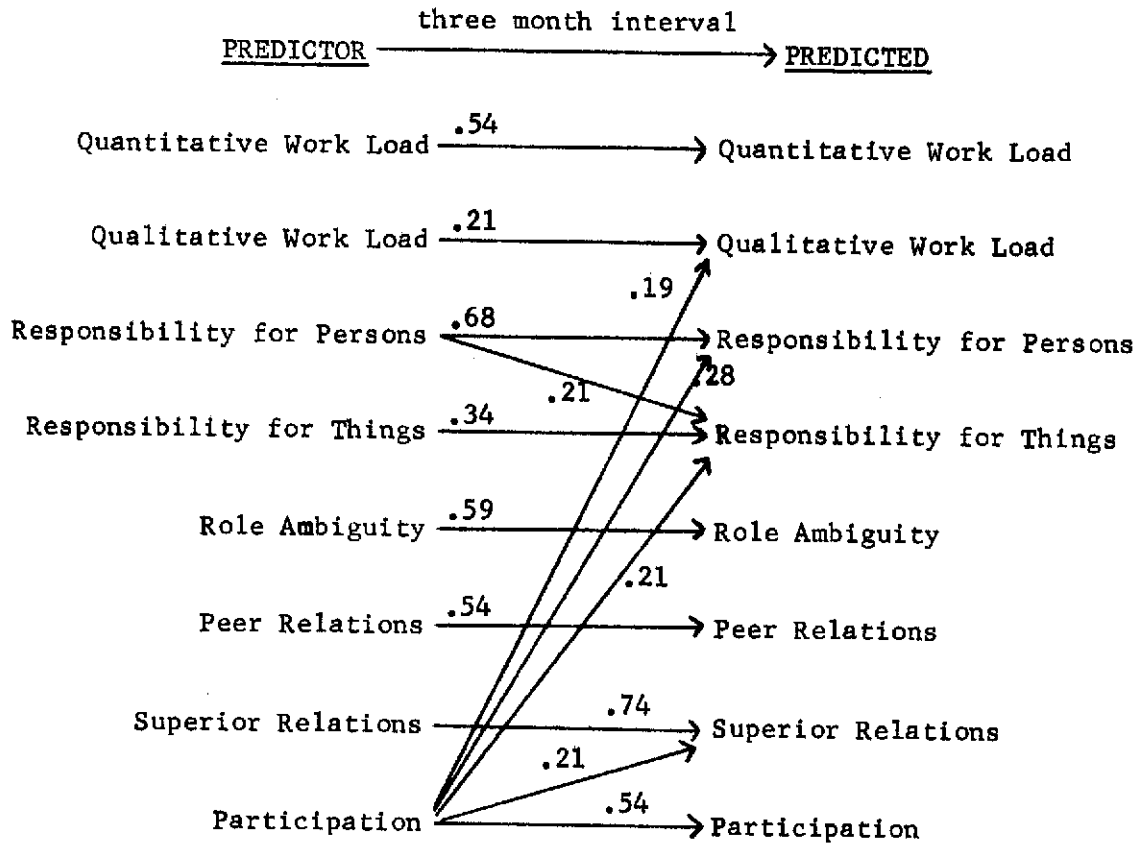


Figure 10. Prediction of P-E fit measures over a three-month time interval

projects, equipment, or whatever, that would not necessarily carry with it a greater responsibility for people. It should also be mentioned that the residuals among the stresses were fairly highly correlated, suggesting short-term relationships among them that can only be studied by measurements of shorter time lag.

Regarding stress-strain relationships, the specific stress measures show virtually no predictive power over one time unit in predicting any of the strain variables. Out of 112 regression coefficients indicating a prediction of stress to strain (and strain to stress), only one reached as high as .20. Furthermore, no clear patterns emerged, such as was the case for Participation predicting to other stress measures. So we can say nothing about specific causal connections. But the matter bears further consideration and explanation. The residual correlations between stresses and strains were somewhat higher than the regression coefficients, particularly for the psychological strains. This again suggests the possibility of short-term relationships not possible to investigate here, given our three-month data collection intervals. Two explanations can be advanced for the higher residual correlations of stresses with psychological strains. The first is methodological artifact--the psychological strain measures were collected on the same questionnaire instrument as were the stress measures, while the physiological data were collected by physical examination and blood test. The second involves specificity vs. generality and was advanced by Caplan (1971) in discussing his findings of relationships between P-E fit and strains, both psychological and physiological. These measures of psychological strain are very general, compared to the specific and differentiated

measures of physiological strain. If, as Caplan suggested, one represents stress by "a dart aimed at a target," one is more likely to hit a broad, undifferentiated target like job satisfaction or self esteem than to hit a small, specific target like, say, glucose or cholesterol levels.

So far we have been considering these data in rather absolute terms--did regression coefficients reach .20, or did a variable show a consistent or interpretable pattern of relationships. But before we abandon this examination, we should look at the values of the regression coefficients for stresses predicting strains, relative to the values for strains predicting stresses. Here we find results that, although surely not conclusive, are interesting and important. If we lower our sights a bit and, for example, look at coefficients of .10 or greater, we find there are fully twice as many such coefficients of stress predicting strain than of strain predicting stress. Studies preceding this one have been mostly cross-sectional data collections, so it could only be assumed that the direction of causation was from stress to strain⁵. We now find this evidence, which needs to be corroborated in later studies, of a general "stress causes strain" relationship in the data.

⁵A few, e.g., Sales (1969), were laboratory experiments offering some evidence that stress causes strain.

CHAPTER 7

DISCUSSION AND IMPLICATIONS

As the reader must surely be aware of now, this experiment neither was carried out quite the way we had planned, nor had the effect we had hoped. The experimental manipulations--use of individual P-E fit data in participative, effective group problem-solving to improve individual P-E fit--were applied, at best, inconsistently across and within the experimental groups. And so the feasibility of a program such as this was not truly tested. But much can be learned by reflecting on this attempt. In this chapter we shall consider the implications of this exploratory study for future studies of its kind.

From reading an account of this program, one can quickly assemble a long list of conditions and occurrences that contributed to the outcome. From each item in such a list, one could derive a "recommendation for the future." We shall try to organize and discuss these recommendations according to the following four categories: 1) pre-program planning and design, 2) documentation and measurement, 3) staffing and training; and 4) program activities. There will be some overlap among the four categories, but they are sufficiently discrete to provide a coherent set of considerations for a future effort.

Pre-Program Planning and Design

Many problems that arose in this program could be alleviated in a future program by selecting a "vertical slice" of the organization to receive the "treatment". Control groups could come from the same

functional area of the organization or could be composed of an entire other "vertical slice" of the organization. Ideally, the effort would then proceed in a "top-down" manner through the Experimental segment of the organization. Let us think for a moment of the benefits of such a strategy.

First of all, this would represent a truer application of the survey feedback model, in that the data could be considered and acted upon at each successive level of the hierarchy. Thus new information or procedures arising from program efforts at higher levels could be passed along as inputs to program efforts at succeeding lower levels. This should promote a climate for constructive change at the lower levels, since constraints due to organizational climate are considerable and increase both in number and intensity as one moves down the hierarchy (Bowers et al., 1973).

Various problems of interfacing also would be alleviated by such a strategy. There were many such problems in the program we have described, and most of these involved contacts with persons in the same "vertical slice". It seems likely that the possibilities for success in solving such problems would be raised considerably by both parties being involved in the program efforts. Also, attempted changes requiring higher-management approval may meet with more favorable consideration. In fact, if higher management were not either involved or at least highly supportive of the program, it might be better to limit the groups' problem-solving efforts to those areas where they had virtually complete authority to institute changes. It would be better to have moderate successes than extreme failures (recall, for example, Group F's efforts to resolve role ambiguities).

In order for any changes to be maintained, such changes need to be reinforced. Again, this strategy seems to promote such reinforcement, since all levels of the hierarchy, above and below the target group, would be involved in working to promote the changes.

Features of the above strategy are consistent with principles of change found in the literature (Benne & Birnbaum, 1969); e.g., that if thoroughgoing changes are to occur within a hierarchical structure, changes should start with the policy-making body, and that to change behavior on any one level of a hierarchical organization, it is necessary to achieve complementary and reinforcing changes in organization levels above and below that level. The strategy also fits in well with the change model of Lewin (1951). Lewin's basic sequencing was 1) an unfreezing of old behaviors or attitudes, 2) a change in those behaviors or attitudes, and 3) a refreezing of the new behaviors or attitudes. According to Lewin, at any one time driving and restraining forces act to produce a "quasi-stationary equilibrium". Change occurs when there is an imbalance between the sum of the restraining forces and the sum of the driving forces.

The results we have reported can be understood in this framework. There was little unfreezing of old behaviors. In most cases, the restraining forces were too great and the driving forces too small. One driving force (the program) was removed, a potential one (reinforcement from other groups or individuals in the organization) was not realized, and the early (pre-program) equilibrium was reacheived. In contrast, a strategy like the one advanced above would , through its intensive concentration in one functional area of the organization, promote unfreezing, increase driving forces for change (involvement

of all--including top management), and help ensure the refreezing (reinforcement) of new behaviors once the formal program had concluded.

Before leaving this section, two other pre-program aspects should be mentioned. First, to promote the successful implementation of the program, the participants should be given a more thorough grasp of the theory and findings that led up to the program. Although this was done to some extent in the recruiting meetings in this study, it probably should have been done even more thoroughly. Most particularly, the potential participants need to understand and accept the fact and importance of individually-identified data for use in improving individual P-E fit. This is in accord with Bennis (1966), who writes that one necessary element in implementing a change is to give the client system as much understanding of the change and its consequences as possible.

Second, to more adequately evaluate the outcome of the experiment, one should be aware of, and avoid if possible, areas of the organization where confounding events are about to occur. For example, in this program one group was split in a reorganization shortly after the program began; another lost its supervisor through retirement early in the program. These two events made interpretation of some program results very difficult. With better knowledge of any impending changes in the system, deliberate decisions could be made regarding possible confounding effects.

Documentation and Measurement

Let us first state that we simply need better documentation than was present in this study, but that will be discussed in the next section. We also need some additional documentation that was not

present at all in this study. This additional documentation is of two kinds, documentation after the formal program (Time 2 to Time 3) and documentation of Controls. We shall discuss the reasons for each after which we shall discuss the need for some "objective" measurement of stress.

In this program we gathered a second round of data immediately after the program's completion and a third round three months after completion. Any effects on stress, due to program efforts, may not have occurred yet by Time 2. This is especially true of efforts near the end of the program. Although such effects would probably show in Time 3 data, we have no record of occurrences between Time 2 and Time 3 to help us interpret the Time 3 data. An example illustrates the problem. Suppose a group made some efforts, near the end of the program, to improve fit with respect to work load. Further suppose that an improvement did not display itself in Time 2 data, but did in Time 3 data. With no documentation between Time 2 and Time 3, at least two explanations are possible. On the one hand, the efforts may have been successful in improving fit by the time of the last measurement. On the other hand, they may have been unsuccessful, but improvement occurred due to some non-program-related incident after our documentation ceased. Taking the same example, if no improvement showed even at Time 3, that could be due either to an unsuccessful effort or to a successful effort offset by some undocumented later occurrence. The reader no doubt can think of other examples. And so we need some sort of documentation up to the final measurement time.

It also would be useful to have some record (hopefully unobtrusive) of events transpiring for the Controls. Results in this study

sometimes showed differences between Experimentals and Controls that seemed attributable to changes occurring for the Controls. With no documentation, it is nearly impossible to speculate about the source of the changes; more importantly, without knowing the source one cannot say whether some aspect of the program acted to retard such change for Experimentals. This is, in some respects, a problem of matching groups prior to the experiment. But some documentation record still would alleviate the problem.

In this study, we had only the participants' (i.e., subjective) ratings of stress. This, too, leads to a problem in interpreting results. For example, if worsened P-E fit was due primarily to a change in the participants' perceptions of what the job was providing or demanding (as opposed to what the participants wanted), one cannot say for certain whether the job supplies or demands actually changed, or whether only the participants' perceptions changed. As one member of Group F stated during a program meeting, "If you define the problem and can't do anything about it, you're worse off than not knowing what to worry about." We have already cited a study (Zand, Steele, & Zalkind, 1969) suggesting that, at least in the case of laboratory training, participants' perceptions of the work environment may change as a result of the experience.

There is a distinction to be noted here. In regard to risk factors, we should be primarily concerned with a change in perceptions about the job, since the subjective measure of the environment is more highly related to strain than is the "objective" measure, at least for work load (Caplan, 1971). However, in regard to evaluating the effect of the program on stress, it would be valuable to know, say, whether

participants actually were allowed less participation in their jobs, or whether they perceived that they were participating less. The point to be made is, in future studies we need additional measures, by some other means than participants' ratings, of work load, participation, or whatever.

Staffing and Training

As a first consideration in this area, we must state that the staff of a future program must have more time committed to the program. This pertains to staff on both the research and action sides of the study. In the current study, time commitments of all parties were not sufficient. The writer was not on-site often enough to coordinate the activities of the staff members. The consultant did not have sufficient time to work with the TAs in preparing for upcoming program activities. And most crucially, the TAs did not have enough of their time available to devote to the program. A few hours a week is not sufficient time to discuss the past meeting, plan for the next meeting, and attend to all the other possible activities that, in the writer's opinion, "slipped through the cracks" because no one had time to devote to the effort.

Part of this burden (especially time for weekly planning) could be lightened by staffing the program with experienced, professional group facilitators. Indeed, to accurately ascertain whether this kind of program can produce the desired results, it should be staffed by such people, since we do not know how the short-comings of this program were affected by inadequate personnel.

If the role of TA is not taken by experienced persons in a subsequent program, much additional training should be given those who do

take the role. Besides this training, there are further training needs for participating supervisors and groups and for observers. We shall discuss each of these in turn.

The TAs should learn much more thoroughly the theory and previous findings that led up to the program effort. If they are not well versed in the theory and findings, one can hardly expect them to guide the meetings in such a way that the study's aims are well-served. They should receive more training in interpreting the data that are fed back to the groups. They also should be trained in facilitating, rather than leading, the groups, so that the groups will come to assume ownership of their own program efforts. Lippitt, Watson, and Westley (1958) point out the importance of a client feeling that it, and not the change agent, has taken the responsibility for completing the task of change. In this program, that responsibility was not often assumed by the groups. This is perhaps best exemplified by Group E's continuing insistence that the program staff take the major responsibility for reporting the results of the group's program to higher management.

Some of the non-transfer of responsibility was no doubt due to the lack of program leadership displaced by many of the supervisors. This problem can be solved in part by training the TAs as facilitators, rather than leaders. But the supervisors also must be prepared to take on the active role. In this study, it was originally planned that the supervisors would phase into prominent leadership as the program progressed. But this rarely happened, in large part because the supervisors were not trained to take leadership in the program. A notable exception to this relative lack of leadership was Group F's

supervisor, and it was probably more than coincidence that he received more staff consultation than did any other supervisor.

The supervisors, then, should also receive a thorough orientation to the principles and findings on which the program is based, and they further should receive training in interpreting the data that is fed back. Most importantly, they should be well-trained in leading their group in problem-solving efforts, since that is the main vehicle for using the data as a base from which to improve P-E fit.

Problem-solving training should be extended to the groups as well. In the program we reported here, although in a few instances TAs mentioned the problem-solving process to the groups, the groups never received any training or practice in using the process which was to be their main vehicle for reducing stresses. It is painfully obvious, in reviewing the meetings (see Chapter 4), that groups stopped at the stage of identifying a solution or two. They all-too-often completely neglected planning implementation steps and evaluating the success of the proposed solution.

From the research side of the program, the observers must receive more training in documenting the meetings. They might, for example, practice the task beforehand in non-program meetings, receiving feedback on their work from research staff who know the study's documentation needs. If a future program proves successful in reducing stress and strain, it will indeed be unfortunate if we have an inadequate record of how it was done.

To a great extent, the paucity of training in all the above areas was due to a shortage of time and personnel to accomplish the training, rather than to a lack of awareness that such training should be

carried out. Nevertheless it should not be allowed to happen that way again.

Program Activities

The training activities we have just described should go far toward ensuring that a true test of the program's feasibility is carried out. But there are additional aspects of the program itself that merit further discussion here. The first concerns its length. The program surely should be extended longer than ten weeks. For example, meetings might occur bi-weekly for six months or a year. If the results are promising, such meetings (along with periodic data collection) could become a continual means of assessing possibilities for reducing stress and strain.

The sentiment among TAs and participants was quite strong for having a longer program, and such a feeling makes sense, given the results of this program. It was naively assumed, before the program began, that groups might solve problems in one stress area per meeting; ten weekly meetings then would have given sufficient coverage. As it turned out, few groups addressed more than two stress areas directly during the program. It is likely that, even with more effective problem-solving capabilities, groups may need several meetings per stress area to define problems, generate solutions, select a solution, and plan implementation steps. To operationalize and later evaluate their planned implementations may take several weeks at least. So in retrospect, ten weekly meetings is clearly an inadequate time to spend in attempting to reduce the stresses of concern in this study.

Regarding the content of the meetings, efforts should be made toward reducing the stress of particular individuals (improving P-E

fit). This aspect of the original plan virtually was never tested in this program. This may have been due in large part to the abortive attempt at individually-identified feedback. As mentioned earlier, in subsequent programs this feature should be made clear and acceptable prior to the program's beginning, perhaps part of a written set of procedures for the program. If groups are to work to improve the P-E fit of individual members, they must have some data base from which to begin.

Considering the findings cited in the review of the literature and also the findings in the last part of the chapter on results, it seems that participation should remain a major focus of program efforts. It is of sufficient importance that, at least in early tests of the program's feasibility, program groups perhaps should be confined to those whose supervisors are sympathetic to the idea of participative means to reduce job stresses.

On the basis of the literature and occurrences in this program, groups should be encouraged initially to look for those problems that are relatively easy to solve, generating early successes.

We assume that insofar as meetings result in successful experiences with work on problems, the data and the meetings themselves will be increasingly attractive to the participants. Conversely, if the meetings lead to failure experiences and frustration, we can expect the data and the meetings to be less attractive to the participants (Miles et al., 1971, p. 312).

Group F's experiences, and to some extent Group B's, certainly affirm the above converse statement.

Finally, the primary purpose of a particular meeting should always be identified. Beckhard (1972) lists four reasons why work groups meet, other than sharing information: 1) to set goals and/or

priorities, 2) to analyze or allocate the way work is performed, 3) to examine the way the group is working, and 4) to examine the relationships among members. All four of these are appropriate to the kind of program considered here. But in order for the group to effectively accomplish its tasks in program meetings, careful attention must be paid to the primary purpose of the meeting, so that efforts do not become fragmented and aimless.

In. Conclusion

However potentially effective an intervention program may be, many obstacles may impede its successful implementation. Gross, Giacquinta, and Bernstein (1971) cite several such obstacles from a study in an educational setting, including 1) teachers' lack of clarity about the innovation, 2) lack of the kinds of skill and knowledge needed to conform to the new role model, 3) incompatibility of organizational arrangements with the innovation, and 4) lack of staff motivation (near the end, as the program was not succeeding). Direct parallels can be drawn to this study.

But, unfortunate as it is, we must realize that the program, as conceived, did not get a true test of its feasibility. It neither succeeded nor failed. In an experiment on a human population, the total program offered is what is evaluated. A specific preventive measure, even if it is the sole component of the program, is tested only indirectly (MacMahon & Pugh, 1970).

So we can only conclude that the offering of a program, in the way this one was done, is not protective against risk of coronary heart disease; we cannot conclude that the program as it could be done is not protective. With this chapter's recommendations as a base, we must

try again. The ultimate goal, the reduction of risk factors in coronary heart disease, is too important to abandon the effort.

REFERENCES

- Argyris, C. Integrating the individual and the organization. New York: Wiley, 1964.
- Argyris, C. T-groups for organizational effectiveness. Harvard Business Review, 1964a, 42 (2), 60-74.
- Barnlund, D. C. A comparative study of individual, majority, and group judgment. Journal of Abnormal and Social Psychology, 1959, 58 (1), 43-50.
- Bass, B. M. The anarchist movement and the T group: Some possible lessons for organizational development. Journal of Applied Behavioral Science, 1967, 3, 211-227.
- Beckhard, R. Optimizing team-building efforts. Journal of Contemporary Business, 1972, 1 (3), 23-32.
- Beckhard, R. & Lake, D. G. Short- and long-range effects of a team development effort. In H. A. Hornstein et al. (Eds.), Social intervention. New York: The Free Press, 1971.
- Benne, K. D. & Birnbaum, M. Principles of changing. In W. G. Bennis, K. D. Benne, & R. Chin (Eds.), The planning of change. New York: Holt, Rinehart & Winston, 1969 (2nd ed.).
- Bennis, W. G. Changing organizations. New York: McGraw-Hill, 1966.
- Blake, R. & Mouton, J. S. Building a dynamic corporation through grid organization development. Reading, Mass.: Addison-Wesley, 1969.
- Blake, R., Mouton, J. S. & Sloma, R. The union-management intergroup laboratory. Journal of Applied Behavioral Science, 1965, 1, 25-57.
- Blake, R., Shepard, H. A. & Mouton, J. S. Managing intergroup conflict in industry. Houston: Gulf Publishing Co., 1964.
- Bowers, D. G. Perspectives in organizational development. Technical Report to the Office of Naval Research, 1970.
- Bowers, D. G., Franklin, J. L. & Pecorella, P. A. A taxonomy of intervention: The science of organizational development. Technical Report to the Office of Naval Research, 1973.

- Bradford, L., Gibb, J. & Benne, K. T-group theory and laboratory method. New York: Wiley, 1964.
- Brooks, G. W. & Mueller, E. F. Serum urate concentrations among university professors. Journal of the American Medical Association, 1966, 196, 415-418.
- Brummet, R. L., Pyle, W. C. & Flamholtz, E. G. Accounting for human resources. Michigan Business Review, 1968, 20, 20-25.
- Campbell, D. T. & Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1963.
- Caplan, R. D. Organizational stress and individual strain: A social-psychological study of risk factors in coronary heart disease among administrators, engineers, and scientists. Unpublished Doctoral Thesis, The University of Michigan, 1971.
- Caplan, R. D. & French, J. R. P., Jr. Physiological responses to work load: An exploratory study. Unpublished manuscript, Institute for Social Research, 1968.
- Cartwright, D. & Zander, A. (Eds.). Group dynamics: Research and theory. (2nd ed.). Evanston, Ill.: Row, Peterson, 1960.
- Chapman, J. M. & Massey, F. J. The interrelationship of serum cholesterol, hypertension, body weight, and risk of coronary disease. Journal of Chronic Disease, 1964, 17, 933-949.
- Coch, L. & French, J. R. P., Jr. Overcoming resistance to change. Human Relations, 1948, 4, 512-533.
- Davis, S. A. Building more effective teams. Innovation, 1970, 15, 32-41.
- Dean, M. Prayers at synagogue stave off heart attacks. Israel Ischemic Heart Disease Project. Jerusalem Post Magazine, 19 February 1971, p. 23.
- Doyle, J. T. Etiology of coronary disease: Risk factors influencing coronary disease. Modern Concepts of Cardiovascular Disease, 1966, 35, 81-86.
- Dunnette, M. D. & Campbell, J. P. Laboratory education: Impact on people and organizations. In G. W. Dalton and L. E. Greiner (Eds.), Organizational change and development. Homewood, Ill.: Irwin-Dorsey, 1970.
- Epstein, F. H. Hyperglycemia. A risk factor in coronary heart disease. Circulation, 1967a, 36, 609-619.
- Epstein, F. H. Predicting coronary heart disease. Journal of the American Medical Association, 1967b, 201, 795-800.

- Epstein, F. H., Francis, T., Jr., Hayner, N. S., Johnson, B. C., Kjelsberg, M. O., Napier, J. A., Ostrander, L. D. Jr., Payne, M. W., & Dodge, H. J. Prevalence of chronic diseases and distribution of selected physiologic variables in a total community, Tecumseh, Michigan. American Journal of Epidemiology, 1965, 81, 307-322.
- Epstein, F. H. & Moore, F. E. Progress report to the National Heart Institute on the National Cooperative Pooling Project. Unpublished manuscript, 1968.
- Faith, R. E. Regression in panel data. Unpublished paper, Survey Research Center, The University of Michigan, 1973.
- Fordyce, J. K. & Weil, R. Managing with people. Reading, Mass.: Addison-Wesley, 1971.
- French, J. R. P., Jr. Field experiments. In L. Festinger & D. Katz, Research methods in the behavioral sciences. New York: Dryden Press, 1953.
- French, J. R. P., Jr. & Caplan, R. D. Organizational stress and individual strain. In A. J. Marrow (Ed.), The failure of success. New York: Amacom, 1972.
- French, J. R. P., Jr., Israel, J. & Aas, D. An experiment in participation in a Norwegian factory. Human Relations, 1960, 13, 3-19.
- French, J. R. P., Jr., Kay, E. & Meyer, H. H. Participation and the appraisal system. Human Relations, 1966, 19, 3-20.
- French, J. R. P., Jr., Rodgers, W. & Cobb, S. Adjustment as person-environment fit. In G. Coehlo (Ed.), Coping, in press.
- French, J. R. P., Jr., Tupper, C. J. & Mueller, E. F. Work load of university professors. Cooperative Research Project No. 2171, U.S. Office of Education. Ann Arbor: University of Michigan, 1965.
- Friedman, M., Rosenman, R. H. & Carroll, V. Changes in the serum cholesterol and blood clotting time in men subjected to cyclic variation of occupational stress. Circulation, 1958, 18, 852-861.
- Gore, S. The influence of social support and related variables in ameliorating the consequences of job loss. Final report to Manpower Administration, U.S. Department of Labor. Springfield, Va.: National Technical Information Service, 1973.
- Gross, N., Giacquinta, J. B. & Bernstein, M. Implementing organizational innovations. New York: Basic Books, 1971.

- Grundy, S. M. & Griffin, A. C. Effects of periodic mental stress on serum cholesterol levels. Circulation, 1959, 19, 496-498.
- Harvey, J. B. & Albertson, D. R. Neurotic organizations: Symptoms, causes, and treatment. In W. W. Burke (Ed.), Contemporary organization development: Conceptual orientations and interventions. Washington: NTL Institute, 1972.
- Herzberg, F. One more time: How do you motivate employees? Harvard Business Review, 1969, 47 (1), 4-12.
- Hornstein, H. A., Bunker, B. B., Burke, W. W., Gindes, M. & Lewicki, R. J. Social intervention. New York: The Free Press, 1971.
- House, J. S. The relationship of intrinsic and extrinsic work motivations to occupational stress and coronary heart disease risk. Unpublished Doctoral Thesis, The University of Michigan, 1972.
- Jenkins, C. D. Psychologic and social precursors of coronary disease. New England Journal of Medicine, 1971, 284, 244-255, 307-317.
- Kahn, R. L. The work module--a tonic for lunchpail lassitude. Psychology Today, 1973, 6 (9), 94-95.
- Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. E. & Rosenthal, R. A. Organizational stress: Studies in role conflict and ambiguity. New York: Wiley, 1964.
- Kasl, S. V. & Cobb, S. Blood pressure changes in men undergoing job loss: A preliminary report. Psychosomatic Medicine, 1970, 32, 19-38.
- Kasl, S. V., Cobb, S. & Brooks, G. W. Changes in serum uric acid and cholesterol levels in men undergoing job loss. Journal of the American Medical Association, 1968, 206, 1500-1507.
- Kasl, S. V. & French, J. R. P., Jr. The effects of occupational status on physical and mental health. Journal of Social Issues, 1962, 18, 67-89.
- Katz, D. & Kahn, R. L. The social psychology of organizations. New York: Wiley, 1966.
- Kitts van Heijningen, H. & Treurniet, N. Psychodynamic factors in acute myocardial infarction. International Journal of Psychoanalysis, 1966, 47, 370-374.
- Kuriloff, A. H. & Atkins, S. T-group for a work team. Journal of Applied Behavioral Science, 1966, 2, 63-93.

- Lawler, E. E., Hackman, J. R. & Kaufman, S. Effects of job redesign: A field experiment. Journal of Applied Social Psychology, 1973, in press.
- Leavitt, H. J. Applied organizational change in industry: Structural, technological, and humanistic approaches. In J. G. March (Ed.), Handbook of organizations. Chicago: Rand McNally, 1965.
- Levitan, U. Status in human organization as a determinant of mental health and performance. Unpublished doctoral dissertation, The University of Michigan, Ann Arbor, Michigan, 1970.
- Lewin, K. Field theory in social science. New York: McGraw-Hill, 1961.
- Likert, R. New patterns of management. New York: McGraw-Hill, 1961.
- Likert, R. The human organization: Its management and value. New York: McGraw-Hill, 1967.
- Liljefors, I. Coronary heart disease in male twins. Hereditary and environmental factors in concordant and discordant pairs. Acta Medica Scandinavica, 1970, Supplement 511.
- Liljefors, I. & Rahe, R. H. An identical twin study of psychosocial factors in coronary heart disease in Sweden. Presented at the American Psychosomatic Society Annual Meeting, Washington, D.C., March 21, 1970.
- Lippitt, R., Watson, J. & Westley, B. The dynamics of planned change. New York: Harcourt, Brace & World, 1958.
- Maier, N. R. F. Psychology in industry. (3rd ed.) Boston: Houghton Mifflin, 1965.
- Maier, N. R. F. Problem solving and creativity in individuals and groups. Belmont, Calif.: Brooks/Cole, 1970.
- Mann, F. C. Studying and creating change: A means to understanding social organization. Research in Industrial Human Relations, 1957, 17, 146-167.
- Mann, F. C. The researcher and his working environment: Research findings and their application. In Vistas in Science. Albuquerque: University of New Mexico Press, 1968.
- Mann, F. C. & Baumgartel, H. J. Absences and employee attitudes in an electric power company. Ann Arbor: Institute for Social Research, 1953.
- Mayo, E. The human problems of an industrial civilization. New York: Viking Press, 1960.

- Miles, M. B., Hornstein, H. A., Calder, P. H., Callahan, D. M. & Schiavo, R. S. Data feedback: A rationale. In H. A. Hornstein et al. (Eds.), Social intervention. New York: The Free Press, 1971.
- Morse, N. & Reimer, E. The experimental change of a major organizational variable. Journal of Abnormal and Social Psychology, 1956, 52, 120-129.
- MacMahon, B. & Pugh, T. F. Epidemiology: Principles and methods. Boston: Little, Brown & Co., 1970.
- McGregor, D. The human side of enterprise. New York: McGraw-Hill, 1960.
- Obradovic, J., French, J. R. P. Jr., & Rodgers, W. Workers' councils in Yugoslavia. Human Relations, 1970, 23, 459-471.
- Ostfeld, A. M. The interaction of biological and social variables in cardiovascular disease. Milbank Memorial Fund Quarterly, 1967, 45, 13-20.
- Parkes, C. M., Benjamin, R., & Fitzgerald, R. G. Broken heart: A statistical study of increased mortality among widowers. British Medical Journal, 1969, 1, 740-743.
- Paul, W. J., Robertson, K. B. & Herzberg, F. Job enrichment pays off. Harvard Business Review, 1969, 47 (2), 61-78.
- Pearson, H. E. & Joseph, J. Stress and occlusive coronary-artery disease. The Lancet, 1963, 1, 415-418.
- Pfeiffer, J. W. & Jones, J. E. Structured experiences for human relations training. Iowa City: University Associates Press, 1969. Volume I.
- The President's Commission on Heart Disease, Cancer and Stroke. Report to the President: A national program to conquer heart disease, cancer and stroke. Vol. 1. Washington, D. C.: U.S. Government Printing Office, 1964.
- Quinn, R. P. & Mangione, T. W. Evaluating weighted models of measuring job satisfaction: A Cinderella story. Organizational Behavior and Human Performance, in press.
- Rahe, R. H., Rubin, R. T., Arthur, R. J. & Clark, B. R. Serum uric acid and cholesterol variability. Journal of the American Medical Association, 1968, 206, 2875-2880.
- Rees, W. D. & Lutkins, S. G. Mortality of bereavement. British Medical Journal, 1967, 4, 13-16.

- Rosenman, R. H., Friedman, M., Straus, R., Wurm, M., Kositchek, R., Hahn, W. & Werthessen, N. T. A predictive study of coronary heart disease. The Western Collaborative Group Study. Journal of the American Medical Association, 1964, 189, 15-22.
- Russek, H. I. & Zohman, B. L. Relative significance of heredity, diet, and occupational stress in coronary heart disease of young adults. American Journal of Medical Science, 1958, 235, 266-275.
- Sales, S. M. Differences among individuals in affective, behavioral, biochemical and physiological responses to variations in work load. Doctoral Dissertation, The University of Michigan, 1969a. No. 69-18098.
- Sales, S. M. Organizational role as a risk factor in coronary disease. Administrative Science Quarterly, 1969b, 14, 325-336.
- Sales, S. & House, J. Job dissatisfaction as a possible risk factor in coronary heart disease. Journal of Chronic Diseases, 1971, 23, 861-873.
- Schein, E. H. Process consultation: Its role in organization development. Reading, Mass.: Addison-Wesley, 1969.
- Schein, E. H. & Bennis, W. G. Personal and organizational change through group methods: The laboratory approach. New York: Wiley, 1965.
- Sloane, R. B., Habib, A., Eveson, M. B., & Payne, R. W. Some behavioral and other correlates of cholesterol metabolism. Journal of Psychosomatic Research, 1961, 5, 183-190.
- Snedecor, G. W. & Cochran, W. G. Statistical methods. Ames, Iowa: Iowa State University Press, 1967.
- Stamler, J. Atherosclerotic coronary heart disease--the major challenge to contemporary public health and preventive medicine. Connecticut Medicine, 1964, 28, 675-692.
- Tannenbaum, A. S., Davcic, B., Rosner, M., Vianello, M. & Weser, G. Hierarchy and ideology. New York: Wiley, forthcoming.
- Tannenbaum, R. Organizational change has to come through individual change. Innovation, 1971, 23, 36-43.
- Taylor, J. C. & Bowers, D. G. Survey of organizations. Ann Arbor, Mich.: Institute for Social Research, 1972.
- U.S. Public Health Service; National Center for Health Statistics. Monthly Vital Statistics Report. Final Monthly Statistics, 1968, 16 (Suppl.), 1-12.

- VanDerValk, J. M. & Groen, J. J. Personality structure and conflict situation in patients with myocardial infarction. Journal of Psychosomatic Research, 1967, 11, 41-46.
- Vickers, R. R. Mediating effects of psychological coping and defense mechanisms on the relation of job stress to psychological strain and coronary heart disease risk factors. Unpublished Doctoral Thesis, The University of Michigan, 1973.
- Wardell, W. I., Hyman, M. M., & Bahnson, G. G. Stress and coronary heart disease in three field studies. Journal of Chronic Diseases, 1964, 17, 73-84.
- Ward, J. H. & Hook, M. E. Use of regression analysis and electronic computers in the prediction of coronary artery disease. Behavioral Science, 1962, 7, 120-126.
- Zand, D., Steele, F. & Zalkind, S. The impact of an organization development program on perceptions of interpersonal, group, and organization functioning. Journal of Applied Behavioral Science, 1969, 5, 393-410.

APPENDIX A

FEEDBACK FORMS

GROUP LEVEL FEEDBACK
 MAJOR INDEXES AND COMPONENT QUESTIONS

	Distribution of Fit						Range Fit	Group Mean Fit
	Mean Group Have	Group Like	above +5	-.6 -.5	-1.6 -1.5	-2.6 -2.5		
<u>Quantitative Workload</u>								
11. The <u>number</u> of projects and/or assignments and tasks you have								
18. The amount of time you spend in meetings								
***19. The amount of time you have								
20. The number of phone calls and office visits you have during the day								
21. The number of conflicting demands you have								
22. The work load, the amount of things that need to be done								
***23. The time to think and contemplate								
24. The <u>quantity</u> of work you are expected to do								
25. The extent to which you feel you never have any time								
<u>Qualitative Workload</u>								
26. The <u>quality</u> of work you are expected to do								
45. The difficulty of assignments you get								
<u>Responsibility for Persons</u>								
12. The <u>responsibility</u> for the work of others that you have								
27. The responsibility you have for the futures (careers) of others								
32. The responsibility you have for the job security of others								
33. The responsibility you have for the welfare of others								
34. The responsibility you have for the professional growth and development of others								
35. The responsibility you have for the morale of others								
36. The responsibility you feel for the careers of others								

*** Indicates scale scores were reversed in scoring total index

- Scale scores for each question (except those which have an asterisk)
- 1= very little
 - 2= little
 - 3= some
 - 4= great
 - 5= very great

	Mean Group Have	Group Like	Distribution of Fit					Range Fit	Group Mean Fit
			above +1.5	+0.5	-0.6	-1.6	-2.6		
<u>Superior Relations</u>									
51.									
The extent to which your superior delegates responsibility to you									
52.									
The extent to which you know what your immediate superior thinks of you, how he evaluates your performance									
53.									
The extent to which your superior is willing to listen to your problems									
54.									
The extent to which your superior has confidence in you and trusts you									
55.									
The extent to which you can trust your superior and have confidence in him									
56.									
The extent to which your superior encourages the persons who work for him to work as a team									
57.									
Your immediate superior's frankness about your work performance									
<u>Peer Relations</u>									
	Mean Group Have	Group Like	above +1.5	+0.5	-0.6	-1.6	-2.6	Range Fit	Group Mean Fit
58.									
The extent to which persons in your work group pay attention to what you're saying									
59.									
The extent to which persons in your work group are friendly and easy to approach									
60.									
The extent to which persons in your work group seem to work together well, offer each other support on job-related problems									
61.									
The extent to which the people in your work group are stimulating, interesting, a source of growth and learning									
62.									
The extent to which persons in your work group are willing to listen to your problems									
63.									
The extent to which others in your work group encourage each other to give their best effort, to work as a team, emphasize a team goal									
***64.									
The extent to which work time is lost because the work group fails to plan and coordinate their efforts									
65.									
The degree of cooperation in the group									

*** Indicates scale score was reversed in scoring total index

Subordinate Relations (This data will not be fed back at this time since individuals may be identified)

66. The quantity of work your subordinates expect of you
67. The quality of the work your subordinates expect of you
68. The quantity of work your subordinates do
69. The quality of work your subordinates do
70. The extent to which your subordinates have trust and confidence in you
71. The extent to which you have trust and confidence in your subordinates
72. The extent to which your subordinates do what you ask them to do
73. How friendly and easy to approach your subordinates are

APPENDIX B

SAMPLE AGENDAS FOR PROGRAM MEETINGS

FIRST MEETING AGENDA

- Project overview
- Presentation of data
- Small group discussions
 - a. Reactions to data
 - b. Any additional stresses?
 - c. Select top three stresses for subsequent meetings
- Reports from small groups
- Decision about which stress area to address first

ROLE AMBIGUITY AGENDA

- Review the questionnaire data on Role Ambiguity
- Break group into pairs.
- Pairs interview one another for 15-20 minutes each. Interviewer records answers on newsprint in the following areas:
 - 1) What do you feel you should be doing to accomplish your job?
 - 2) What expectations do others have of what you should be doing?
 - 3) List any areas of confusion or ambiguity you have about what you should be doing.
 - 4) List any confusions or ambiguities you have about what any other members of the group should be doing (be specific as to individuals).
- Post newsprint around the room and review for everyone.
- Identify those areas of confusion/ambiguity most common to members of the group and problem-solve regarding what should be or can be done about them.
- Identify actions necessary to alleviate the ambiguities.

INTERFACING AGENDA

--Review questionnaire data on Interfacing.

--Rank-order interfaces by degree of stress to the group as a whole.

--Break into sub-groups.

a) Each group take a separate interface stress source and identify:

1) How do we see them?

2) How do we see us?

3) How do we think they see us?

4) How do we think they see themselves?

b) Identify the critical stresses caused by interfacing with the specific outside group and propose solutions to the stresses.

--Reports from sub-groups, discussion, and problem-solving.

PARTICIPATION AGENDA

--Review the questionnaire data on Participation.

--Break into sub-groups.

a) Characterize in general

1) The way decisions are made in this group

2) The way you would like them to be made.

b) List the major kinds of decisions made in this group.

1) Assess how much involvement staff should have (none to high).

2) Which staff should be involved?

c) Which decisions are/should be shared widely?

d) Who is/should be involved in these decisions?

e) What changes would you recommend to the total group?

--Reports to the total group on the above discussions.

APPENDIX C

MEASURES OF STRESS

STRESS INDICES AND COMPONENT QUESTIONS¹Quantitative Workload

- The number of projects and/or assignments and tasks you have
- The amount of time you spend in meetings
- *The amount of time you have
- The number of phone calls and office visits you have during the day
- The number of conflicting demands you have
- The work load, the amount of things that need to be done
- *The time to think and contemplate
- The quantity of work you are expected to do
- The extent to which you feel you never have any time

Qualitative Workload

- The quality of work you are expected to do
- The difficulty of assignments you get

Responsibility for Persons

- The responsibility for the work of others that you have
- The responsibility you have for the futures (careers) of others
- The responsibility you have for the job security of others
- The responsibility you have for the welfare of others
- The responsibility you have for the professional growth and development of others
- The responsibility you have for the morale of others
- The responsibility you feel for the careers of others

¹Each item (with the exception of Interfacing items) was accompanied by a second item asking how much (of the particular item content) the respondent would prefer. The wording of these second items varied to conform to the wording of each listed above. The actual format and response alternatives may be found in Chapter 2. Items preceded by an asterisk are reverse-scored.

Responsibility for Things

The responsibility you have for carrying out projects and assignments

The responsibility you have for initiating assignments and projects

The responsibility you have for budgets and expenditures

The responsibility you have for equipment and facilities

Role Ambiguity

The extent to which your work objectives are defined

The extent to which you can predict what others will expect of you tomorrow

The extent to which you are clear on what others expect of you now

How clear the scope and responsibilities of your job are

Interfacing

Persons in your own branch or office

Persons in other branches or offices in your division

Persons in other divisions in your directorate

Persons in other directorates at your base or center

NASA employees at other bases or centers

Persons not directly employed by NASA such as contractors and persons from other government agencies and industry

Other (rate only if you specified other persons in the questions above)

Participation

The amount of say or influence you feel you have over how your work group is run

The overall amount of control you exercise over what happens on your job

The amount of authority you have to carry out your responsibilities

The amount of say you have in decisions

The extent to which you can discharge your responsibilities

Superior Relations

- The extent to which your superior delegates responsibility to you
- The extent to which you know what your immediate superior thinks of you, how he evaluates your performance
- The extent to which your superior is willing to listen to your problems
- The extent to which your superior has confidence in you and trusts you
- The extent to which you can trust your superior and have confidence in him
- The extent to which your superior encourages the persons who work for him to work as a team
- Your immediate superior's frankness about your work performance

Peer Relations

- The extent to which persons in your work group pay attention to what you're saying
- The extent to which persons in your work group are friendly and easy to approach
- The extent to which persons in your work group seem to work together well, offer each other support on job-related problems
- The extent to which the people in your work group are stimulating, interesting, a source of growth and learning
- The extent to which persons in your work group are willing to listen to your problems
- The extent to which others in your work group encourage each other to give their best effort, to work as a team, emphasize a team goal
- *The extent to which work time is lost because the work group fails to plan and coordinate their efforts
- The degree of cooperation in the group

Subordinate Relations

The quantity of work your subordinates expect of you

The quality of the work your subordinates expect of you

The quantity of work your subordinates do

The quality of work your subordinates do

The extent to which your subordinates have trust and confidence in you

The extent to which you have trust and confidence in your subordinates

The extent to which your subordinates do what you ask them to do

How friendly and easy to approach your subordinates are

APPENDIX D

MEASURES OF PSYCHOLOGICAL STRAIN

SELF ESTEEM INDEX

Below are the items for occupational self esteem as they appeared in the questionnaire. The respondent was asked to place an "X" in the space to indicate how he saw himself in his work.

HOW I SEE MYSELF IN MY WORKMiddle

- a. Doing my best ___: ___: ___: ___: ___: ___: ___: ___: ___: ___: Not doing my best
- b. Sad ___: ___: ___: ___: ___: ___: ___: ___: ___: ___: Happy
- c. Successful ___: ___: ___: ___: ___: ___: ___: ___: ___: ___: Not successful
- d. Do not know my job well ___: ___: ___: ___: ___: ___: ___: ___: ___: ___: Know my job well
- e. Important ___: ___: ___: ___: ___: ___: ___: ___: ___: ___: Not important

On this last line indicate with an "X" your overall evaluation of yourself in your work; that is, how high or low you presently evaluate your total picture of yourself in your work.

- f. Low ___: ___: ___: ___: ___: ___: ___: ___: ___: ___: High

CONTENT-FREE JOB SATISFACTION INDEX¹

We'd like to find out more generally how you feel about your present job. Check the one response for each question which comes closest to honestly describing how you feel.

If you had the chance to start your working life all over again, would you choose the same kind of work you are doing now?

- (1) Yes, definitely
- (2) Yes, probably
- (3) Unsure
- (4) No, probably not
- (5) No, definitely not

All things considered, how satisfied are you with your present job?

- (1) Completely satisfied
- (2) Well satisfied
- (3) Neither satisfied nor dissatisfied
- (4) A little dissatisfied
- (5) Very dissatisfied

Overall, how do you think your job compares with the jobs that most other people have?

- (1) Much better
- (2) Somewhat better
- (3) As good as most, neither better nor worse
- (4) Somewhat worse
- (5) Much worse

¹ Items are depicted exactly as they appeared in the questionnaire.

INDICES OF INTRINSIC AND EXTRINSIC JOB SATISFACTION

In both measures, for items above the line, respondents were asked to indicate how much they agreed or disagreed with each statement regarding their job. Response alternatives ranged from 1) Strongly disagree to 5) Strongly agree, except for items preceded by an asterisk, for which respondents were asked, "In your present job, how much can you do each of the following things?" Response alternatives ranged from 1) Not at all, to 5) Very much.

Extrinsic Measure

** The amount of money I make is one of the less good features of my present job.

My present job gives me the chance to gain a position of power and influence in my organization or occupation.

No one can look down on my present job or line of work.

My present job or line of work has status or prestige, that is, other people look up to it and feel it is important.

In my present job or line of work, I can make more than enough to live on.

My present occupation enables me to raise my social position.

** In my present job or line of work, I might not always make enough money to give myself and my family most of what my friends and neighbors have.

Making more money is a major reward for working hard in my present job or line of work.

My present job or line of work gives me the security of a steady income with little danger of a drop in earnings.

* Earn a good deal of money.

** Reverse-scored item.

Intrinsic Measure

** The work I do on my present job is rather boring.

The work I do on my present job serves a larger purpose beyond my own benefit or enjoyment.

** My present job does not demand that I keep learning new things and improving my skills.

** My present job does not require me to use by best abilities except in a pinch.

My present job gives me the chance to improve and develop my own special skills and abilities.

On my present job, I have the chance to do the things I'm best at.

** The work I do on my present job is dull and monotonous.

** The work I do on my present job does not contribute to something that I believe in deeply.

* Learn new things.

* Have responsibility for making sure your own work is done properly.

* Really believe in the value of what you are doing.

* Use your own ideas.

* Do interesting work.

* Use your skills, knowledge, and abilities

* Decide how to organize and perform your work.

** Reverse-scored item.

APPENDIX E

DOCUMENTATION FORMS

Note Sheet for Running Account¹

Observer's Name _____

Date _____

GSFC Code No. _____

Page No. _____

¹This and subsequent pages of the appendix are exact copies of the forms distributed to the observers and of the PMR form completed by the participants at the end of each meeting.

Observer _____
 Date _____
 GSFC Code Number _____

GUIDELINES FOR RUNNING ACCOUNT

1. Identify the Major Goals for the meeting (including the agenda)
 Describe the degree to which each of these goals was accomplished
 Describe other items that were accomplished that were not planned for.
2. Identify the major segments of the meeting--including the topic, the discussion content, the amount of time, and any decisions made.
3. Identify important incidents related to group variables, stresses, and buffers.. Cite group members by name (abbreviation) where possible.
4. Describe behavior of leaders (training associate and supervisor) in terms of role played, impact on group, and alternative ways of handling situations.

On the Note Sheets for Running Account, take copious notes on the content and process of the meeting. Keep in mind the above guidelines and also the variables listed on the sheet opposite your Note Sheet in the notebook. Refer to the Guides for Observation of a Group and List of Leader Functions for further definition of the variables you should be observing and noting.

As soon as possible following the meeting, edit your notes. Editing should include the following points: (a) make sure all writing is legible, (b) highlight the important points of the meeting, (c) clarify issues where necessary, (d) amplify issues where necessary, (e) add a short summary and conclusion. You should strive to produce edited notes that are certain to give the reader the impressions you wish to give of what happened in the meeting.

GUIDES FOR OBSERVATION OF A GROUP

1. What indications do you detect of tenseness, lack of ease; or relaxation, ease?
2. What indications are there that the group has a goal? That there is general agreement on the goal?
3. What degree of involvement do you detect? Which members appear uninterested? Keenly interested? Withdrawn? Deeply concerned?
4. What do you observe that indicates that members are free to express their ideas? Feelings? Are guarded or careful in expressing themselves?
5. Identify the leadership of the group. Note changes. Is there a pattern? Is the leadership function distributed among the members? Is it concentrated in one or a few members?
6. Are decisions reached by the group? Which members assume that a decision has been reached when it has not? Which individuals assume that silence means consent? Are decisions being made by a minority? How are decisions made--by vote, consensus, or other means?
7. Is the group using the resources of its members? Who is not contributing? Are some encouraging others to contribute? Are some interrupting others? Are there members who indicate a desire to contribute but who can't get a chance to talk?
8. Are there any indications of factions within the group? That a few members support each other because of friendliness? Which individuals or small group of members do not feel that they belong to the main group?
9. Are members objectively seeking new ideas, trying to learn, looking for values in new ideas?

LIST OF LEADER FUNCTIONS

- A. Initiating: Includes attempts to get movement started in the group.
1. Suggests action step: suggests new procedure, topic of conversation, any action to be taken.
 2. Suggests defining: suggests definition or clarification of any problem, issue, topic of conversation, or goal.
 3. Clarifies problem: defines a problem, goal, or issue; clarifies these in any way.
 4. Offers idea: gives an idea, phrases one of the alternatives; offers an item in any list made by the group.
- B. Regulating: includes attempts to regulate the direction and pace of the group.
5. Controls direction: brings group back to the issue or topic, attempts to steer wanderers.
 6. Set pace: calls attention to time, energizes, attempts to control tempo.
 7. Attends to agenda: provides continuity, keeps track of business to be covered, tells where we were at last meeting, acts as "Keeper of agenda."
 8. Makes summary: thus helps to organize and direct discussion, terminates discussion and leads to new phase.
- C. Informing: includes attempts to bring information or opinion to the group.
9. Provides information: acts as resource to the group, gives information or data to the group.
 10. Draw out opinion: attempts to draw out feeling, opinion, or information from the group, tries to get data upon group opinion or feeling.
 11. Gives opinion: expresses opinion on some issue or topic.
 12. Suggests data getting: suggests manner of getting data or collecting data outside of group, tells where data may be obtained.
- D. Supporting: includes attempts to support other proposals and initiations, as well as attempts to support and maintain the group in its efforts to handle its task.
13. Supports proposal: attempts by voice, manner, or expression to give support to a proposal or idea given by another.

14. Attempts to harmonize: attempts to make harmony between two ideas or two people in the group.
 15. Relieves tension: makes any remark which allows the group to take a second breath, to get new energy for the task.
 16. Voices group feeling: indicates concern for the group as a group, induces feeling of well being, expresses a strong group-centered remark.
 17. Accepts blame: becomes the scapegoat, accepts blame for any defection of group from its level of aspiration, allows group to proceed, reduces group feeling of guilt.
 18. Performs chores: opens windows, passes sugar for coffee, suggests chairs be arranged for better visibility, goes to blackboard as recorder, does housekeeping chores.
- E. Evaluating: includes attempts to induce an evaluation of any kind of of the processes, decisions, or goals of the group.
19. Notes group process: calls attention to process, asks for a process report or evaluation when relevant to the task, asks "where are we now" questions.
 20. Interprets policy: makes an interpretation of policy, precedent or rules of group, and compares with present issue or decision.
 21. Tests feasibility: evaluates issue or pending decision by pre-examining practicality, makes "if so, then.." remarks.
 22. Tests consensus: attempts to determine what group thinks on an issue, phrases questions for a vote, makes a trial run for consensus.

Name _____

GSFC Code No. _____

Date _____

PMR Form

	Very Little	Little	Some	Great	Very Great
	[1]	[2]	[3]	[4]	[5]
CHECK <u>ONE</u> BOX IN EACH LINE					
1. In general, to what extent are you satisfied with today's meeting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. To what extent did you feel support (friendliness, attention to your ideas and comments) from others in the group today?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. A. To what extent <u>did</u> you take an active part in today's meeting?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. To what extent did you <u>want</u> to take an active part in today's meeting?...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. What is your pulse rate today? _____

9. What is your blood pressure? _____ systolic _____ diastolic

10. In the last week, would you say that the job stresses on you have decreased, stayed the same, or increased? (Check one space below.)

Decreased a lot Decreased somewhat Stayed same Increased somewhat Increased a lot

Other comments on today's meeting (Put on back of this sheet)

APPENDIX F

PARTICIPANTS' COMMENTS AT CLOSE OF PROGRAM

Following are the verbatim comments written by the participants on the PMR from the final program meeting. Each person was asked to indicate the most and least satisfying aspects of the program, and to list any changes he would recommend for future programs.

Group A

Most Satisfying Aspects

A good forum for discussion of branch problems and feelings. The group was very frank and open. Provided a good basis for communications, particularly w/(one member)

Development of cohesive group which produced identification of stresses/problems and some suggested solutions

Various things were brought out during the meetings which dealt with work which should have been discussed a long time ago; also on supervisors, and management.

Full discussion

Changes within operating procedures of branch

The frankness involved and learning that co-workers perceive problems in common with mine--also good place to let off "steam"

Least Satisfying Aspects

Time consuming (my work load was very high at this time). This leads to the point that the people most requiring such sessions may be the ones that can least afford it time-wise.

Virtually none

Cannot say there were, all aspects accomplished something

Can't identify

Number of "drop-outs"

In order to cover the areas required, we sometimes had to grapple with intangibles which were not amenable to objective solutions.

Recommended Changes

I don't know

Use feedback from program for future continuation of these meetings.

Really don't know.

None

Have larger groups--include Division level personnel

Participation of Division level

Group BMost Satisfying Aspects

Few if any

The difference in the ascending order of problems between the different disciplines within the branch

Help is there (however their hands are tied)

- a. Ability to talk freely about work problems to supervisors and to express opinions
- b. Clarification of branch problems forgotten, some kind of action out of management.

To learn that problems affected individuals of the group to a great extent.

The open and free discussions

The clarification of the different causes of stress

One aspect was the identification of some of the problems which have been troubling the branch. The main trouble was that people knew something was wrong but no previous attempt had been made to analyze what these problems were. Being able to discuss these problems in a group was a definite plus.

Tabulating problems and realization of the complexity of the problems.

The interplay of ideas and clarification of thinking.

I got to know the real personalities of the people in the group and believe it will help me in working with them.

Least Satisfying Aspects

Lack of understanding on the part of some of the participants as to the real objectives of the program rendered the program ineffective.

Nothing can be done at this time to give relief by way of manpower (civil servants) increase and weeding out of dead wood.

Management will never be told of what is our main stress and why.

Time lost from work.

To learn that very little can or will be done to rectify problems discussed in our meetings.

Too much absenteeism (both on part of leaders and participants)

The short duration of the program and the fact that many questions (solutions) are still unanswered.

The least satisfying aspect of the program was the paranoid secrecy that was evident among some of the members of the group. The group did a fine exercise in force field analysis, and then completely disintegrated when it came time to apply the results. Some participants missed completely the primary purpose of the sessions and treated it all as a nefarious plot by upper management to spy.

Not being able to discuss results of exercises with upper management for corrective action or help.

The fact that I do not believe top management supports this program.

Nothing will be done about problems brought out by the meetings.

Recommended Changes

A better briefing as to the purpose and intent of the program.

Some form of program to get management (Division Chiefs and above) to participate, then compare results of their problems and ours to see if there exists a common base to build a better relationship.

Forget the program.

Include Division Chief in group.

To have management made aware of situation and have proper remedies applied from top level management.

I recommend a longer-time program for the course.

The main changes should consist in better presentation of what the main aims of the program are; i.e., not to solve all of the problems of the group, but to present the techniques of problem solving and how to apply them to reduce individual tensions of the group.

Participation by upper management.

Force top management to be more involved in the program.

More information about the purpose of the program.

Group C

Most Satisfying Aspects

A chance to learn what individuals in this group think about their work situation.

Find out what problems caused stress within the group among other members.

The fact that some problem areas were identified, particularly in supervisor relations, participation, and responsibility.

Problem areas were identified and the group did seem to begin to work together to solve these.

It apparently solved a major problem I had, at least temporarily.

Least Satisfying Aspects

Inability to make an immediate impact on the interface problems

Very little impact on problems that originate outside the section

That little can be done to eliminate the identified problems

I don't believe that my own stress level had reduced as yet

During this solution period and because of certain unpleasantness that arose during that time, I felt I was under extremely high stress. For these reasons I had second thoughts about the project.

Recommended Changes

Maintain a regular program of individual, section, and branch information exchange.

Higher-level management participation so that the problems brought up in the section meetings (working level) will be recognized.

Get a stronger commitment from higher management for support and participation in the program. This would perhaps provide a means of eliminating some of the problems which can only be solved from outside the section.

The working group involved should include supervisors at higher levels than section head.

How do you say uncomplimentary things about someone without causing ill feelings? Possibly include branch head.

Group D

Most Satisfying Aspects

Hearing people express themselves freely.

The discussion was frank and open. I think that much good can come from it, if we follow through on the ideas presented.

Two areas: 1) The group discussions which allowed each of us to understand the problems of the others within the group, as well as our own problems. 2) The increased number of physical examinations which help to develop a better case history of my medical condition.

I could bitch about my job problems.

Identification of problem areas--recognition that others in group have same problems.

Highlighting of potentially significant problem areas.

Least Satisfying Aspects

Was better than expected. No clear-cut solutions indicated.

In all probability, for any significant results, especially medically, the program should have been longer.

Realizing that some of the problems cannot be solved.

I don't think it could significantly change the problems

Delays in scheduling meetings. Interpretation of questionnaire answers

Realization that many potential problems have no solution which can be practically implemented.

Recommended Changes

None.

I am really not sure.

Learn to live with problems which cannot be solved.

Retire.

Less frequent meetings over longer time span, e.g., one per month for one year

Cannot say, since I did not participate in entire program.

Group EMost Satisfying Aspects

The program allowed me to know my people better and provided a foundation for solving problems.

To better understand my fellow worker.

Problems brought out into open--getting acquainted with group's problems--getting individual reactions, responses, and contributions; identifying stress areas

Cannot say, since I only attended three meetings.

Opportunity for people to get stresses off their chest.

There was little satisfying aspects of this program.

Ability to voice your opinions and ideas with a reasonable amount of freedom.

Airing stress areas via group therapy.

Became better acquainted with the group.

It relieved some stress for me, although I feel this would have been accomplished without the meetings but probably not as soon.

Least Satisfying Aspects

Knowing that stress areas required upper management action.

The end result.

Some people not active.

Cannot say, since I only attended three meetings

Some stress areas impossible to resolve

Stress areas were not defined to my satisfaction.

Creation of animosity to some fellow workers, be it a small amount or large.

Program too short to really get at the more complex problems that should be solved at upper management levels.

Perhaps some real sources of stress were not identified and the help-
less(sic) to solve other real sources.

Most of the section I feel really doesn't have stress as much as they do with problem areas which can be readily resolved within the section. Seems like the stress areas are in upper management areas of which we can't do much about.

Recommended Changes

If the program is continued the groups involved (should) be at the Division level

None.

More professional guidance, say, once every third or fourth session only as an aid to the session leader. Maybe having Dr. Seashore or Dr. French come to session

(This lengthy answer suggested the stress areas were more "universal or profound" than what really appeared--RIF, love, hate, personality conflicts, marital conflicts--and further suggested that a qualified psychoanalyst should have chaired or observed the meetings.)

Calculate % of stresses that affect a group.

Better definition of difference between a stress area and problem area; group meetings with Dr. French or Dr. Seashore; more group participation.

Have individual interviews after stress meetings on a "one to one" basis.

Longer program--we covered too much ground too fast. Think we should spend more time on relieving stresses we have identified rather than to push on with next meeting's agenda.

Some private interviews to bring out areas that individuals are reluctant to discuss in group.

Uncertain, but feel that outside stresses (non job-related) have an effect on creating a stress while on the job.

Do You think a report should be made to higher management--in what form?¹

Yes, in order for mgt. to be aware of the existence of stress areas-- a general report of known stress areas with recommendations for action and program continuation.

Yes--the three people in charge of this program meeting with mgt. and present the problem. Then an informal discussion with mgt. and Dr. French plus the group.

Yes, this should be from Drs. French/Seashore--this should be an oral report, not written, from Dr. Seashore and his associates as a group. A written report, however, should be given to management for their record.

I cannot answer this question from neither a positive or negative standpoint, as I don't know what the final outcome of the meetings resulted in (final conclusions). However, I thought these reports were supposed to be confidential, or shall I say, restricted to certain people on a need to know basis.

Yes--to the highest level on center.

No

Yes--with the utmost of respect and with interest in any problem their subordinates may have or had.

Yes, so they can be made aware of stresses that are prevalent in the section and possibly relieve some of them--thru channels (NASA) with Dr. Seashore and staff acting arbitrators.

Yes--a meeting between mgt and the stress study group and (the supervisor)

Yes--believe the way (one member) recommended is the best way.

Group F

Most Satisfying Aspects

Contributing data.

¹These are answers to a special question posed to this group at the end of the program.

Discussion of work problems and their identification are therapeutic.

The open approach and the ideas generated by individuals.

The sincere section intent and effort to identify major causes of stress and do something about it/them.

Communication ease confirmed; problem areas defined; some solutions may be evident, others not.

Identifying problem areas.

The free physical; helped to illustrate some problem areas.

Problem discussions.

Being made aware that most everything bothering me (stress, frustration) was really a group/organization phenomenon and not just an individual one.

Identified major source of frustration and confusion; i.e., role ambiguity and generated proposed solutions.

Least Satisfying Aspects

Effectivity(sic) of solving basic problem.

Management reluctance to make changes which might make job accomplishment easier and more satisfying--and remove sources of stress by meaningful mgmt changes.

The realization that all ideas although good cannot be implemented.

Report from upper management levels that no changes in NSM's Directorate role would be made and change of objective from problem solution to problem tolerance

Time consuming--detracts from productive (mission) work time; no participation (effective) by (higher managers).

Inability to resolve any problem areas.

None.

Re-organize GSFC.

An apparent inability to deal with problems identified

Inability to press any of the above solutions (re Role Ambiguity) toward implementation.

CHAPTER 5

RETROSPECTIVE PICTURES OF EXPERIMENTAL GROUPS

In this chapter a retrospective picture of each Experimental work group will be presented. It is hoped that these pictures, along with the meeting summaries just presented, will give a background setting within which to view the results that will follow.

The material for these pictures was taken primarily from three sources. First, the contents of the meeting summaries just presented were used. Second, on the final PMR the participants were asked, among other things, to list the most and least satisfying aspects of the program and any changes they would recommend for possible future programs. These comments have been drawn upon. Third, a few weeks after the program concluded, the writer conducted a debriefing interview with each TA, in which the TA recounted at some length the history of the program for the group with which he had been associated. The contents of those interviews have been used. The reader again should recognize that, insofar as much of what follows is taken from the summaries (and hence the observers' notes) and the debriefing interviews, the pictures rest heavily upon the judgments and interpretations of the TAs, and in many cases, the writer as well.

The general format of the pictures is as follows: a very brief overview of the group's program is repeated; the roles of the supervisor and the TA are described; the particular stress areas worked

Recommended Changes

Involvement of management from the top.

Analysis of program by management prior to any continuation to determine whether they really want to "bless" the program.

The study should be done with higher management with an input of these results for their consideration.

Continue section meeting discussions of problems, any potential problems. Somehow, talking about problems common to group was beneficial.

I would like to see greater participation by "authorities" such as Dr. Seashore and Dr. French. Also I would like down to earth participation by (higher managers). The communication could be much improved.

Educate higher management; define/redefine NSM/NSC responsibility.

None.

None.

Maintain the increased communications inside the group (which was due to the stress study program).

Either 1) concentrate on problems which group has means to control or 2) provide means of solving problems that lie outside of group; i.e., open channels to communicate problems to management and proposed solutions, and motivate management to respond.