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INTERPERSONAL FACTORS IN RESEARCH

Studies in Selected Aspects of
Performance, Communication
and Attitudes

PART I

Conducted at THE NATIONAL INSTITUTES OF HEALTH by the
INSTITUTE FOR SOCIAL RESEARCH • UNIVERSITY OF MICHIGAN

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This report is a continuation of the Human Relations Study of the National Institutes of Health, begun in the spring of 1952. The study is one of a series of investigations on the functioning of large organizations, conducted by the Human Relations Program of the Survey Research Center, Institute for Social Research. The latter is an interdisciplinary research branch of the University of Michigan.

The study is being financed by a contract with the National Institutes of Health, Public Health Service, U. S. Department of Health, Education and Welfare.

The report was prepared by Robert C. Davis, Glen Mellinger, Donald C. Pelz, and Howard Baumgartel, under the general direction of the third author. Assisting in the project were Homer C. Cooper, Lois L. Davis, and Elinor Wood.

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PREFACE

The Human Relations Study of NIH was undertaken to serve two related objectives: an "applied" and a "basic" research goal.

The "applied" goal is to assist NIH in diagnosing and solving some of its human relations problems, so as to maintain high work motivation, reduce frustrations which may hinder performance, and improve relations between individuals and groups. The "basic" research goal is to augment scientific knowledge of how large organizations function, and how they can function more effectively.

To meet both of these objectives, several types of data were obtained. In the fall of 1952 all employees were asked to fill out a written questionnaire, concerning attitudes toward the job itself, supervision, directors and administrative officers of the NIH and the institutes, promotional and salary systems, working conditions, auxiliary services, and other aspects of the working environment. A copy of the questionnaire for intramural professionals (those conducting laboratory research) is appended. Other categories of employees received slightly different forms.

In January of 1953 a second set of data was obtained. Within each of the major laboratories, and within each broad field of work or discipline, several qualified investigators were asked to evaluate the scientific performance of individuals within that laboratory or field. An overall judgment of relative standing in the group was requested, rather than a series of ratings on specific qualities. Details are given in Appendix A.

Supplementary interviews were also held with a limited number of individuals and small groups.

All of these data were obtained with the understanding that no individuals would be identified. Opinions were to be reported only for groups. The evaluations of scientific performance would not be reported for individuals, and would be used for analysis only.

The first year of the study constituted a diagnostic phase. An extensive analysis was carried out to answer such questions as:

What are strong or weak points in the working environment at NIH? What are major sources of frustration?

What groups within the organization are affected most strongly? For example, in what institutes, among what employee categories, is the greatest dissatisfaction or tension expressed?

This analysis resulted in a General Report of the first years findings. */ It was aimed mainly at the applied objective.

The second year of the project has stressed both practical and theoretical goals. On the practical side detailed reports of opinions in each laboratory or branch were prepared and discussed with directors and laboratory chiefs in each institute, over a period of several months. Excerpts from the personal interviews and from written comments were also circulated.

On the more theoretical side, several analyses have been carried out in order to understand how the organization operates and how its effectiveness might be improved. These results are the subject of the present report. Analysis along similar lines is being continued, and a supplementary report (to be issued as Part II) is planned for the spring of 1955.

The paper by Davis considers several conditions in the individual or in the social environment which may lead to a higher or lower level of research performance. The paper relates the assessors' evaluation of each individual to several questionnaire items obtained from the same person. What motivations in the scientist, and what relations between the scientist and his supervisor, are more effective in terms of the subordinate's research accomplishment? Davis finds important connections between performance and the scientist's personal emphasis on scientific contribution, the degree of influence he has on his chief's activities, and the degree of liking or confidence which the scientist feels toward his chief. Significant is the fact that these connections are not simple; rather, a complex set of conditions is required for high performance.

Mellinger's paper considers another aspect of organization functioning: that of communication. In an effective organization there must be some general agreement on its goals and the policies for reaching them. To what extent does discussion among members result in closer agreement, or in greater understanding of the other person's viewpoint? Mellinger finds that communication as such may not have these results; interpersonal factors such as liking

*/ Human Relations in a Research Organization, by Donald C. Pelz, Glen D. Mellinger, and Robert C. Davis. Two vols., pp. 1-334, Institute for Social Research, University of Michigan, Ann Arbor, 1953.

and confidence or trust have an important bearing on the outcome.

The chapter by Pelz takes up the specific topic of auxiliary services. Where should services be located, and what channels used to obtain them, for maximum effectiveness in the eyes of scientists? What part do the institute administrative offices play in obtaining services, and how does their role affect the adequacy of results? Pelz finds that interpersonal factors such as strains and frictions between scientists and administrative officers are more significant than the particular channels used.

Baumgartel's chapter presents some results in which the laboratory is used as the unit of analysis, rather than the individual scientist. Laboratory scores on some two dozen questionnaire measures of motivation and satisfaction were obtained, to answer questions such as: Does a laboratory's emphasis on health problems reinforce or inhibit its emphasis on basic science? What factors in the work itself lead to satisfaction with scientific leadership or with promotional opportunities? Two distinct clusters of data are found, one an orientation toward basic science, the other an orientation toward both health and prestige. Some of these same items were found useful in Chapter I for understanding individual scientific performance. Baumgartel's results are part of a larger analysis to determine how the laboratory leadership can influence the motivations and satisfactions of the group.

While the aim of these analyses was to establish general principles, they also have practical implications. The latter are particularly stressed in Chapter III on auxiliary services. The first two chapters have implications for scientific supervision and for methods of communication. The fourth chapter will be useful in understanding the meaning of the specific laboratory data which were discussed with each group this past year.

ABBREVIATIONS

NIH	National Institutes of Health
NIAMD	National Institute of Arthritis and Metabolic Diseases
NCI	National Cancer Institute
NHI	National Heart Institute
NIDR	National Institute of Dental Research
NIMH	National Institute of Mental Health
NMI	National Microbiological Institute
ISR	Institute for Social Research (University of Michigan)

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APPENDIX B

CHAPTER I

FACTORS RELATED TO SCIENTIFIC RESEARCH PERFORMANCE

Robert C. Davis

A. Problems and Methods

A major concern of the NIH study is to determine what kinds of interpersonal relations are associated with effective research.

More specifically, we want to answer such questions as these: does it make a difference, in terms of performance, toward what general goals the scientist is motivated? How do patterns of mutual influence and personal feeling between the scientist and his chief relate to performance? Are the same decision-making procedures related to performance in the same way for all levels of research personnel?

These and related questions formed the basis for the selection of the social and psychological variables in this analysis of research performance.

Methods of assessing research performance

The term "research performance" as used in this study denotes an overall concept which includes both the ideas of "productivity" and "creativity." That the assessment of current research performance is a reasonable aim is based on the fact that, in the conduct of everyday work, scientists informally assess the relative value of the research of their colleagues. In fact, on the basis of these judgments research is planned, funds allocated and prestige accorded.

In developing methods for measuring performance, consultation with advisory groups of scientists led to two conclusions: first that the judgments of fellow scientists would be the best way to measure the performance of individual researchers, and second, that a single overall assessment should be made. It was felt that an attempt to rate specific dimensions separately -- such as "creativity", "soundness", etc. -- would create a sense of artificiality for the assessors.

To make the rating process concrete the assessor was asked to think of each scientist on his list as a potential candidate for a research grant, and to select those who were equipped to turn out the best possible research within the next few years. In making this evaluation, assessors were asked to keep in mind a variety of elements that go into effective research work. Some persons may be valued more for creativity, others more for persistence and efficiency. The specific guidelines for assessors are reproduced in Appendix A. Because age, grade, etc., could be corrected for later, raters were asked not to make allowances for such factors.

Each researcher was rated by at least two assessors from each of two groups: one group familiar with his laboratory, the other with his field of work or discipline. The advisory committees of scientists suggested the initial group and the latter in turn suggested additional assessors. Qualifications sought in assessors were: competence in a given area of research, familiarity with the individuals to be rated, and the ability to make relatively objective judgments of others. Care was taken to draw assessors from both supervisory and non-supervisory ranks.

Lists of scientists by laboratories and fields were given to the respective assessors, who crossed off unfamiliar names as well as their own. The assessors were asked to divide the list into two or more categories on the basis of the criteria already mentioned. Some chose to divide their group into "higher" and "lower" performers; some preferred to distinguish several categories of performance.

Two methodological steps remained: combining the multiple ratings into a single laboratory and discipline score respectively for each individual, and consolidating these two ratings into a final combined score. ^{*/} The details of these procedures will be found in Appendix A; a brief summary will suffice here.

A preliminary inspection of ratings eliminated a few assessors whose ratings were markedly divergent from the others. Within each assessment group the ratings of the various assessors were converted into comparable scores. At this stage an examination was made for widely discrepant patterns. The pattern of ratings for each person assessed was examined, and those few individuals having widely discrepant pat-

^{*/} An exploratory scaling, using only a high-low division, is reported in Human Relations in a Research Organization (2 vols., Institute for Social Research: Ann Arbor, 1953), Chapter 8 and Appendix C. This preliminary system has been superseded by the present nine-point scale, which provides greater sensitivity and flexibility in analysis.

terms were eliminated. The scores of the several assessors for each individual were then averaged, thus giving a laboratory and a discipline score.

These two scores were correlated to see if both the laboratory and discipline assessors were in reasonable agreement. When it was determined that they were, the scores were merged into a final nine-point scale. */

Criteria for choosing
scientists for the sample

It was felt that in order to reduce the range of differences in performance which might be ascribed to education or experience, we should limit the present inquiry to those scientists holding doctoral degrees, and to those with at least a grade of GS-9, or its Corps equivalent. Further, we included only those intramural scientists who are primarily engaged in active research or who directly supervise it. Laboratory chiefs, scientific directors, and institute directors were omitted because in general they are not supervised by scientists engaged in research.

Out of 334 persons who were given Form 1 (intramural professional), 234 scientists met these criteria. We obtained a final performance score on 204, or 87% of the selected group. On 26 of the cases there was either no assessment made (due to unfamiliarity, too short a time at NIH, etc.), or assessment by only one assessor. Four cases were eliminated because of widely discrepant ratings.

The analysis presented here is based primarily on the 204 cases, reduced in some instances by non-response on given items which are being related to performance.

*/ As to the validity of the scale, there is one independent piece of evidence which should be mentioned. On fifty individuals we have information on the number of publications in the last three years. We find that those who are rated high on the performance scale may have either a large or small number of publications, but those who are rated low have, almost without exception, a low number of publications. Because of this type of relationship it seems safe to infer that the ratings were based, in accordance with the instructions, on criteria which include "productivity" but go beyond it.

Adjustment of the
performance measure

In order to study the relations of interpersonal factors to research performance, it is necessary to control, as far as possible, performance differences associated with age, experience and achievement. These variables are reflected in grade to a large extent, and grade, as we would expect, is correlated with performance. It was therefore decided to "control" grade by means of a statistical adjustment of the performance scores.

The procedure of adjustment was as follows: the entire distribution of scores in a grade category was simply moved up or down until the average performance fell at the middle of the nine-point scale. Thus, the average performance in each grade category has the adjusted score of five.

The performance data presented in this report are in terms of the adjusted measure. The adjustment made it possible to study those variations due to environmental factors, and to make generalizations which include the entire population of scientists.

It should be kept in mind that the variables in this analysis are derived from two independent sources: the performance measure from the groups of assessors, and the attitude variables from the questionnaires filled out by the individual scientists. The independence of these two kinds of measures adds weight to the findings in which they are significantly related.

B. Analysis and Findings

In examining the factors which facilitate or inhibit the translation of research impetus into research performance, we decided to begin with the motivations of the scientist in his role as researcher and work "outward" into the immediate environment in which he must work. In doing so we are quite conscious of the fact that we are examining a process which is in reality circular. Motivation is not a constant quantity, but it is affected by social factors external to the individual. However, we are examining the individuals and situations at a single point in time. For this reason it is convenient to start with motivation as it exists at that point.

Measuring motivation in terms of value orientation

Motivation, as the term is most generally understood, signifies the purposive, goal-striving aspect of human behavior. It involves a selective orientation to a goal, and the degree of intensity of the desire to reach the goal.

In the present analysis we are interested in what the scientist wants to get out of his role as researcher, and how important it is to him to get what he wants. Accordingly, we set up measures of orientation to two sets of goals or "rewards" which are potentially available in the role of researcher in a large organization.

The first may be called a science orientation. It involves the degree to which doing research has an intrinsic value for the scientist. The second is an institutional orientation. It concerns the degree to which rewards derived from the organization, such as advancement and prestige, are of importance. */

We asked these questions about factors contributing to satisfaction with the job to get at the science orientation (item 50 in the questionnaire):

"How important is each one to you?"

- Contributing to basic scientific knowledge
- Freedom to carry out my own ideas; chance for originality and initiative
- Chance to use my present abilities or knowledge"

*/ These concepts are modifications of those used by D. Marvick: Career Perspectives in a Bureaucratic Setting (University of Michigan Press: Ann Arbor, 1954).

and these to get at the institutional orientation:

"How important is each one to you?

- Having an important job in the organization
- Association with high-level persons having important responsibilities
- Sense of belonging to an organization which has prestige in the lay community."

There is a sizeable intercorrelation between the three items in each set of questions. Therefore we were able to make indices of high to low science and institutional motivation respectively, from the two sets of questions.

Most of the scientists show a high degree of science motivation, but a moderate or low degree of institutional motivation. It was decided to cut each index at a point which divided the group roughly in half. Each scientist therefore received a score of high or low on each value, depending on which half of the total group he fell in. The important thing to keep in mind is that the terms "high" and "low" are relative. One should be especially careful in interpreting labels. The only differentiations which can legitimately be made are those which denote the relative emphasis in orientation toward the two values.

Validity of the value measures

The value measures have internal consistency and seem to represent logical clusters of items. However, if the measures are to be considered valid, they should show predictable and meaningful relations to other variables.

We would expect the indices to differentiate between scientists who prefer a relatively pure research setting with comparatively little emphasis on institutional rewards, and those who prefer the opposite kind of setting. To test this hypothesis, the scientists were asked where, if they were to leave NIH, they would prefer to work (Question 48). The alternatives were universities, industry, private practice, other PHS, other government, etc. We would predict that the university setting would be the most congenial to the person highly motivated to science, whereas the person highly motivated toward institutional values would choose other settings. It is evident from research at NIH and elsewhere that the university is perceived by sci-

entists largely in terms of the values we have called the science orientation. */

The results are shown in Table 1-1. As we expected, significantly more of the high science people prefer universities than do low science people, and significantly more high institutional people choose "other" rather than universities, compared to those holding low institutional values. The differences are even greater when both value orientations are studied jointly. **/ Among those holding high science, but low institutional values, 85% prefer the university setting. However, for those having the low science and high institutional motivations, only 42% choose universities. (See Table 1-1.)

These data lend support for the validity of the value measures, by confirming the hypothesis concerning preference of organizational settings. We may predict further that those having high rather than low institutional motivations will be more willing to accept promotions contingent on assuming supervisory or administrative functions.

The following question (item 62) was asked:

"Would you be interested in a higher-level job at NIH if it meant doing less of your present work and more of something else? For example, would you be interested in a higher-level job which required spending a large part of your time on the activities below? . . .

- Professional leadership: stimulating or advising subordinate professionals about their work
- Administrative planning or coordination: allocation of funds, recruitment of personnel, expediting of services, etc."

*/ In the Steelman Report, for instance, 64% of the scientists who said "freedom in research" was important to them preferred the university setting. Other such data are found in the President's Scientific Research Board, Science and Public Policy (5 vols., GPO: Washington, 1947), Vol. 3, Appendix III, pp. 205-252.

**/ The joint use of two or more variables in relation to another, as in the present case, illustrates how relationships may be "sharpened" by stating the conditions under which the relationship occurs. The procedure is used throughout the analysis. It serves two functions: it is a means of statistically "controlling" variables, and it serves as a constant reminder of the complexity of social data.

TABLE 1-1

Motivations Related to
Type of Setting Preferred
if Leaving NIH

<u>Preference for:</u>	<u>Science Motivation</u>			<u>Institutional Motivation</u>		
	<u>High</u>	<u>Low</u>	<u>Diff.</u>	<u>High</u>	<u>Low</u>	<u>Diff.</u>
University setting	78%	50%	28%	60%	77%	-17%
Other settings	22	50		40	23	
	<u>100%</u>	<u>100%</u>		<u>100%</u>	<u>100%</u>	
N =	125	82		121	86	
	Chi-square: 16.98			Chi-square: 6.72		
	Sig. at: .001 */			Sig. at: .01 */		

Combinations of the Two Motivations

<u>Preference for:</u>	<u>High Sci., Low Inst.</u>	<u>High Sci., High Inst.</u>	<u>Low Sci., Low Inst.</u>	<u>Low Sci., High Inst.</u>
University setting	85%	72%	62%	42%
Other settings	15	28	38	58
	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>
N =	54	71	50	32
	Chi-square: 20.91			
	Sig. at: .001 */			

*/ The significance level indicates the probability of the differences occurring due to chance alone. Thus, .01 ("significant at the .01 level of confidence") means that there is only one chance in 100 of a difference this large being attributable to chance. A confidence level of .05 (1 chance in 20) is generally the lower limit for "significant" differences.

Table 1-2 shows that significantly more scientists in the high, compared to the low institutional group, are willing to take on science supervision activities. However, there is no appreciable difference between those of high and low science motivation.

TABLE 1-2

Motivations and Interest in a Higher-Level Job
Involving a Large Amount of Time in Supervising Scientists

<u>Interest</u>	<u>Science Motivation</u>			<u>Institutional Motivation</u>		
	<u>High</u>	<u>Low</u>	<u>Diff.</u>	<u>High</u>	<u>Low</u>	<u>Diff.</u>
Yes, or possibly	81%	80%	1%	88%	70%	18%
No	19	20		12	30	
	<u>100%</u>	<u>100%</u>		<u>100%</u>	<u>100%</u>	
N =	120	81		118	83	
	Chi-square: .009			Chi-square: 10.39		
	Not significant			Sig. at: .01		

One step beyond direct supervision of research is taking on additional administrative duties not of a direct research character. Again we would predict that high institutionalists would be the most willing to accept these duties, while the researchers with high science motivation would be the least receptive. As Table 1-3 shows, the hypothesis concerning the institutional measure is confirmed. No significant difference is revealed by the science measure.

In view of these relationships, it seems safe to conclude that our two measures are in fact measuring two qualitatively different sets of values held by scientists.

TABLE 1-3

Motivations and Interest in a Higher-Level Job
Involving a Large Amount of Time in Administrative Work

<u>Interest</u>	<u>Science Motivation</u>			<u>Institutional Motivation</u>		
	<u>High</u>	<u>Low</u>	<u>Diff.</u>	<u>High</u>	<u>Low</u>	<u>Diff.</u>
Yes, or possibly	23%	27%	-4%	30%	17%	13%
No	77	73		70	83	
	<u>100%</u>	<u>100%</u>		<u>100%</u>	<u>100%</u>	
N =	113	77		110	80	
	Chi-square: 0.45 Not significant			Chi-square: 3.89 Sig. at: .05		

Motivation and
research performance

Other things being equal, we would expect performance to increase as motivation increases. In the present case, this means that the greater the science motivation, the higher the research performance is likely to be. This is in fact the case, as Figure 1-1 shows. The figure shows a significant increase in performance with increase in science motivation. However, examining the same group on institutional motivation, no significant difference is found.

At first glance it would seem to follow from this finding that institutional motivation, in itself having no relation to performance, need not be considered further. However this is not the case. We know that there are some researchers with high science motivation who have institutional motivation as well. If we control on institutional motivation, we may find that science motivation is related to performance in a different manner.

Figure 1-2 shows the results. For researchers with low institutional motivation, the more science motivation the higher the performance. But for researchers with high institutional motivation, performance does not vary significantly with the degree of science motivation.

FIGURE 1-1

Motivation,
as Related to Research Performance

Research
performance

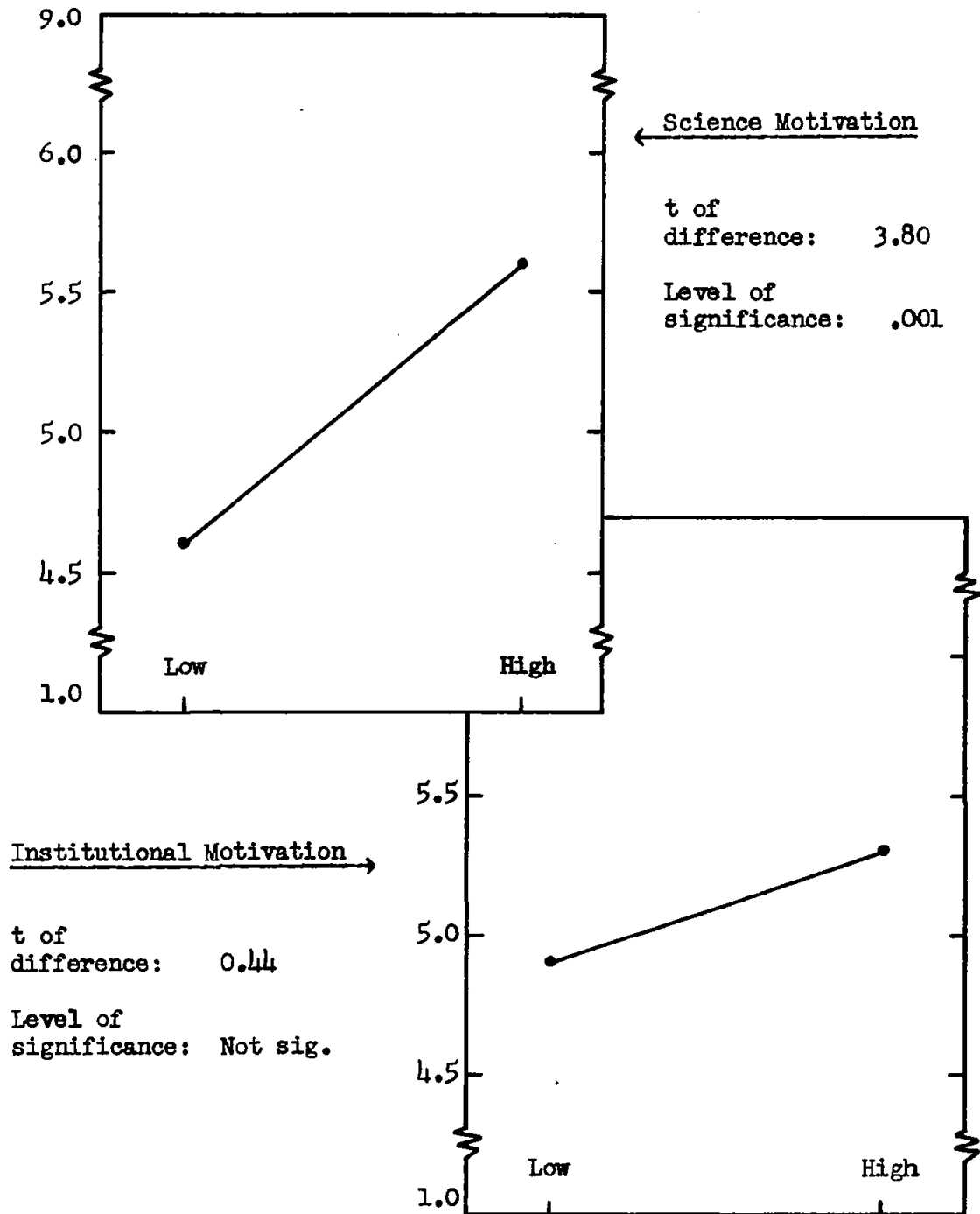
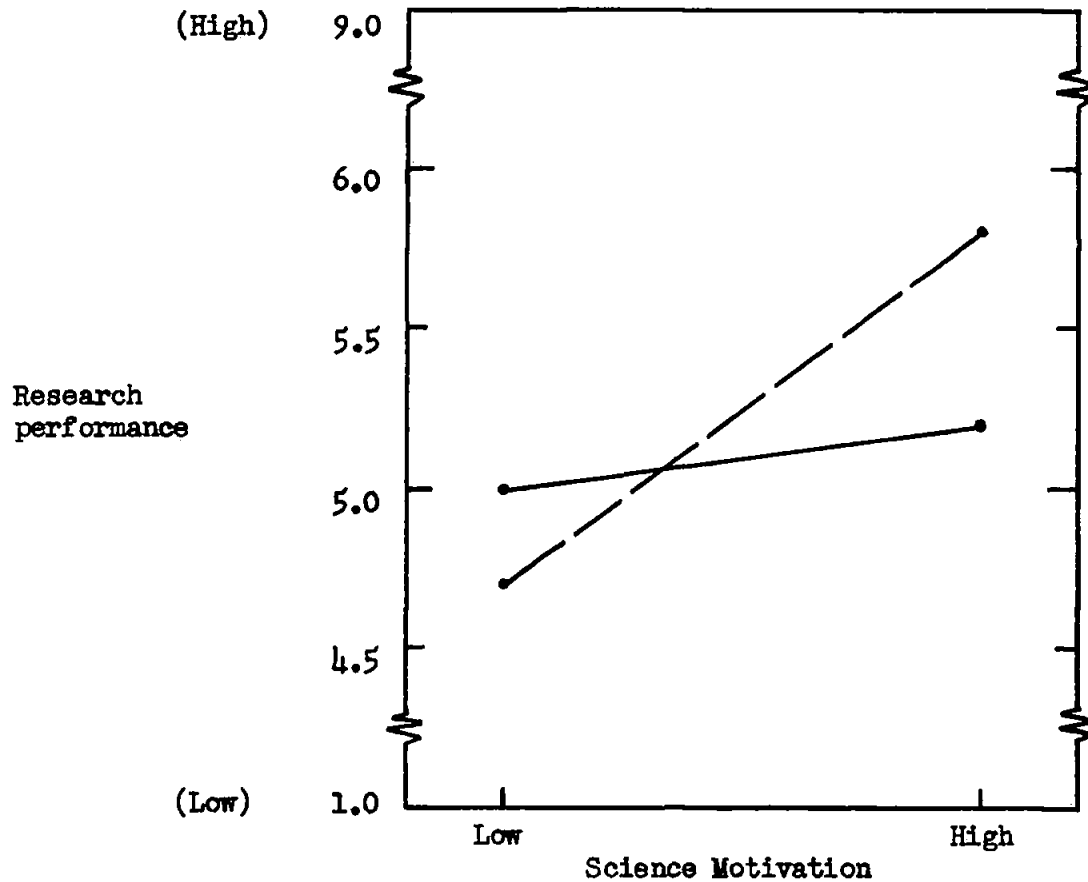


FIGURE 1-2

Science and Institutional Motivation,
as Related to Research Performance



<u>Institutional Motivation</u>	<u>t of difference</u>	<u>Level of significance</u>
High —————	0.61	Not sig.
Low — — — — —	2.82	.01

The most important fact presented in Figure 1-2 is that high science motivation combined with high institutional motivation is associated with lower research performance than is a single-minded science motivation. */

The interpretation which seems most meaningful is that this situation represents a conflict between two strong goals in which part of the science motivation is channeled into the pursuit of institutional ends. In concrete terms, the researcher may be using some of his time and energy in activities related to his institutional interests.

This is a relatively simple explanation of what is, doubtless, a complex process. And furthermore, no attempt has been made to trace the functions that institutional motivations may have in the organization. **/ Nevertheless, pending further evidence, the conflict interpretation stands as the most meaningful in conjunction with the other findings.

Influence as a factor in performance

We have related certain motivational measures of the individual to his performance without regard for the context in which he operates. One of the major conditions of the social environment is the mutual influence of chief and subordinate with respect to research matters. Scientists were asked two related questions (items 10 and 11):

"To what extent do [the chief's] activities or decisions affect your work, directly or indirectly?"

" . . . to what extent do you feel you could influence him in regard to these activities (if you wanted to)?"

*/ It might be expected that the Commissioned Corps and the Civil Service personnel would vary on the two value orientations, but there is no significant difference between them. Furthermore, satisfaction with the promotion systems of the Corps and Civil Service is not significantly related to the values held by their respective members.

**/ We do know, however, that those scientists who express an interest in higher-level supervisory jobs do not necessarily have the same motivation as scientists who actually hold these supervisory positions. Neither science nor institutional motivation varies significantly among non-chiefs, unit, section, and laboratory chiefs.

The distributions of responses were such that they could be dichotomized between "a great deal" and "moderately", thus forming relatively "high" and "low" influence groups. It is important to note that the measures represent the subordinate scientist's perception of the chief's influence and of his own influence. */ Each scientist is considered as a subordinate, even though he may supervise other scientists.

Neither chief's nor subordinate's influence alone is significantly related to performance. The trend is clear, however: the higher the subordinate's influence and the lower the chief's influence, the higher the subordinate's performance; but the differences are not significant.

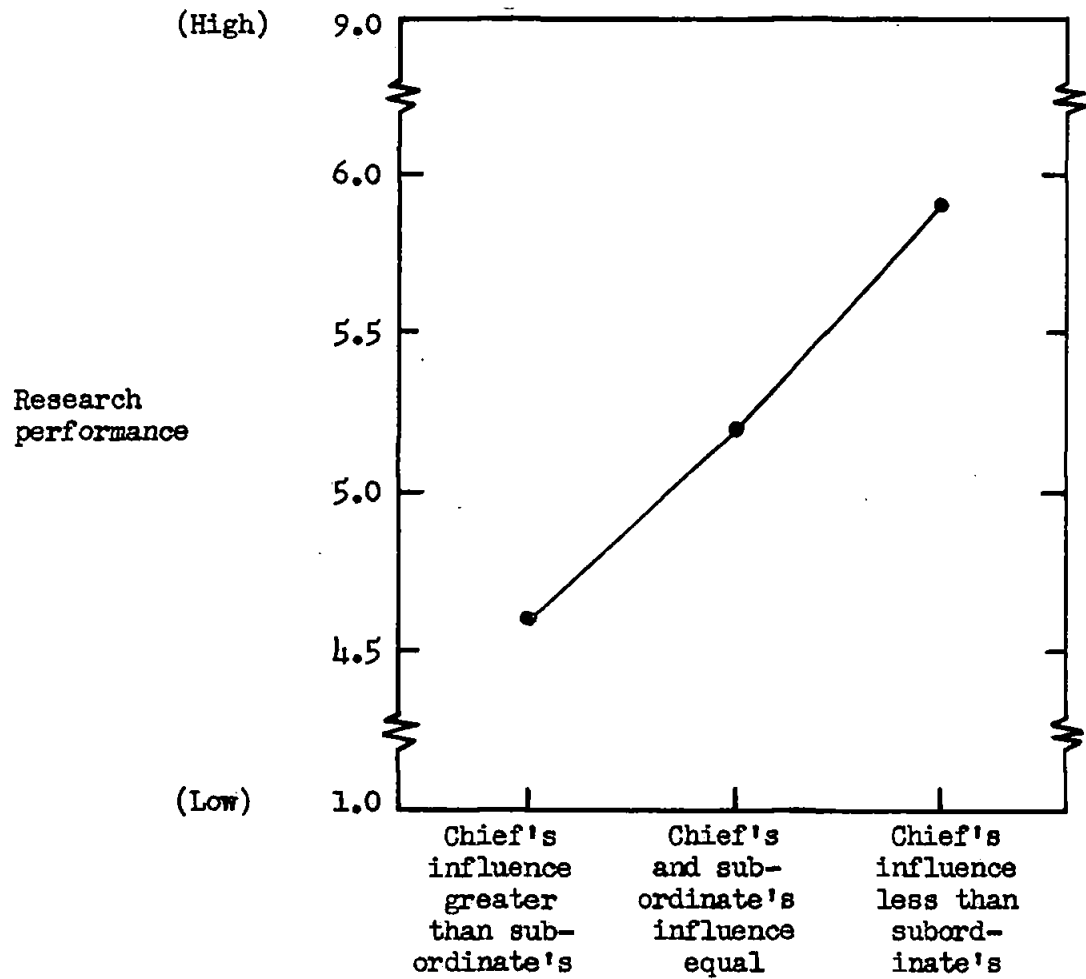
The implications of this finding are developed further in Figure 1-3, where the relative balance of chief and subordinate influence, not merely the level of each one separately, is related to performance. Equal influence, whether equally high or low, forms the midpoint of a three-point scale of the balance of influence. When the balance is favorable to the chief, the performance is significantly lower than when it is in favor of the subordinate.

There are two alternative interpretations, each based on different assumptions, to explain the relationship of influence to performance. One is that subordinate influence is a sort of autonomy which constitutes a reward for past research performance. The better a scientist's research, the more influence he is given. The other interpretation is that influence may be a facilitator of performance; that is, the more elbow room the scientist has -- the more control over his own work and over decisions affecting him -- the better job he will do. In all probability a combination of both series of events would better reflect the reality of the situation. But because we have data at one point in time we can only infer the process -- which means, in effect, weighing the evidence for the two major interpretations.

*/ The two measures of influence are not significantly related to each other; that is, high chief influence is about equally likely to go with high or low subordinate influence. Nor do the two influence measures vary significantly with grade, or between non-chiefs, unit chiefs, and section heads.

FIGURE 1-3

Balance of Influence Between Chief
and Subordinate, as Related to
Research Performance



F ratio

5.11

Level of significance

.01

Motivation, influence and performance

We know that science motivation is related to research performance. Our problem now is to specify the conditions under which the relation holds, and those under which it does not. Subordinate's influence — the variable we have just examined briefly — is important in this connection. In essence it is a general measure of the scientist's control over those things important to the research process.

Figure 1-4 relates science motivation to performance under conditions of high and low influence. For scientists with high influence, the degree of science motivation is significantly related to performance. However, for low influence scientists there is no significant difference between those with high or low motivation. In other words, high motivation toward science, when coupled with low influence, is not associated with performance appreciably above that of a low science, low influence researcher.

The gist of the figure is this: either high science motivation or high influence separately is not sufficient; only when they are joined are they associated with outstanding performance. This effect suggests the facilitative function of influence. Influence, in this instance, appears to operate as one of the necessary conditions favorable to effective research performance. It is difficult to interpret these results in terms of the alternative hypothesis that influence is mainly a reward following high performance. If this hypothesis were correct, one would not expect low as well as high performers to be accorded high influence.

Confidence and liking in chief-subordinate relations

The emotional tone in interpersonal relations is a difficult thing to measure. It is nonetheless important, especially when the interplay of influence is involved in making decisions.

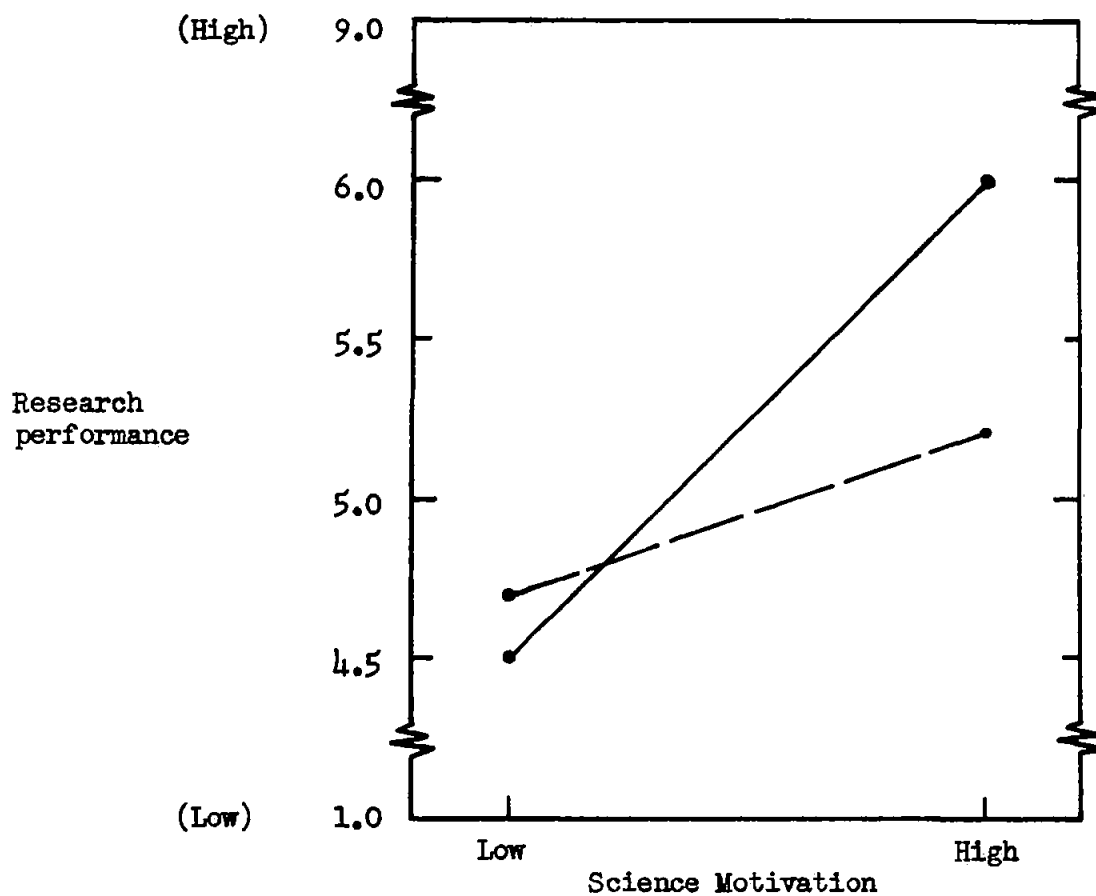
We asked two questions which were designed to get at a general "feel" of the chief-subordinate relations (items 13 and 12, respectively):

"To what extent do you have confidence in the chief's intentions and motives? Do you feel he is always sincere in his dealings with others? Does he really mean what he says?"

"How strongly do you enjoy your contacts with [the chief] — whether you like him personally, gain professional stimulation from him, or enjoy contacts with him for any other reason?"

FIGURE 1-4

Subordinate's Influence and Science Motivation
as Related to Research Performance



<u>Subordinate's Influence</u>	<u>t of difference</u>	<u>Level of significance</u>
High —————	3.26	.01
Low ——— ———	1.50	Not sig.

The answers tend to pile up at the "positive" end. In order to get a high-low division, it was necessary to consider an answer which expressed less than complete confidence or very strong enjoyment as "low". At first glance this may seem to be an unrealistic breaking point, but it became evident that any deviation from the statement of absolute confidence or enjoyment represents more negative interpersonal feeling than the verbal categories imply. */

We find, from data not shown here, that neither confidence nor enjoyment as such is significantly related to performance. In conjunction with other measures, however, these variables show clear relationships. Figure 1-5 shows subordinate's influence as related to performance under high and low confidence. The performance of the low confidence group varies strikingly with the degree of influence. But no such variation characterizes the higher confidence group. It is clear that ability to influence the chief is more important, in terms of performance, to those subordinates who have low confidence in the chief. The same conclusion follows from Figure 1-6 for the low enjoyment group. Only under low enjoyment is influence significantly related to performance.

The meaning of these findings seems to be that high influence can serve as a defense against potential interference by a chief who is not trusted. The chief may be only mildly annoying, or he may seem actually threatening, but the subordinate in the low confidence group is likely to consider the chief's decisions and actions as unwelcome intrusions. And, if our interpretation is correct, a sense of control over the situation mitigates this apprehension.

We may call this the defensive function of influence. Like the facilitative aspect, it is clear that the defensive function can be operating only if influence is viewed as a condition of performance, rather than a reward which follows performance. Again the latter interpretation is difficult to draw from these data. Why should high performing scientists be given less influence by a chief whom they trust or enjoy a great deal? If anything we might expect the reverse on the basis of the reward hypothesis.

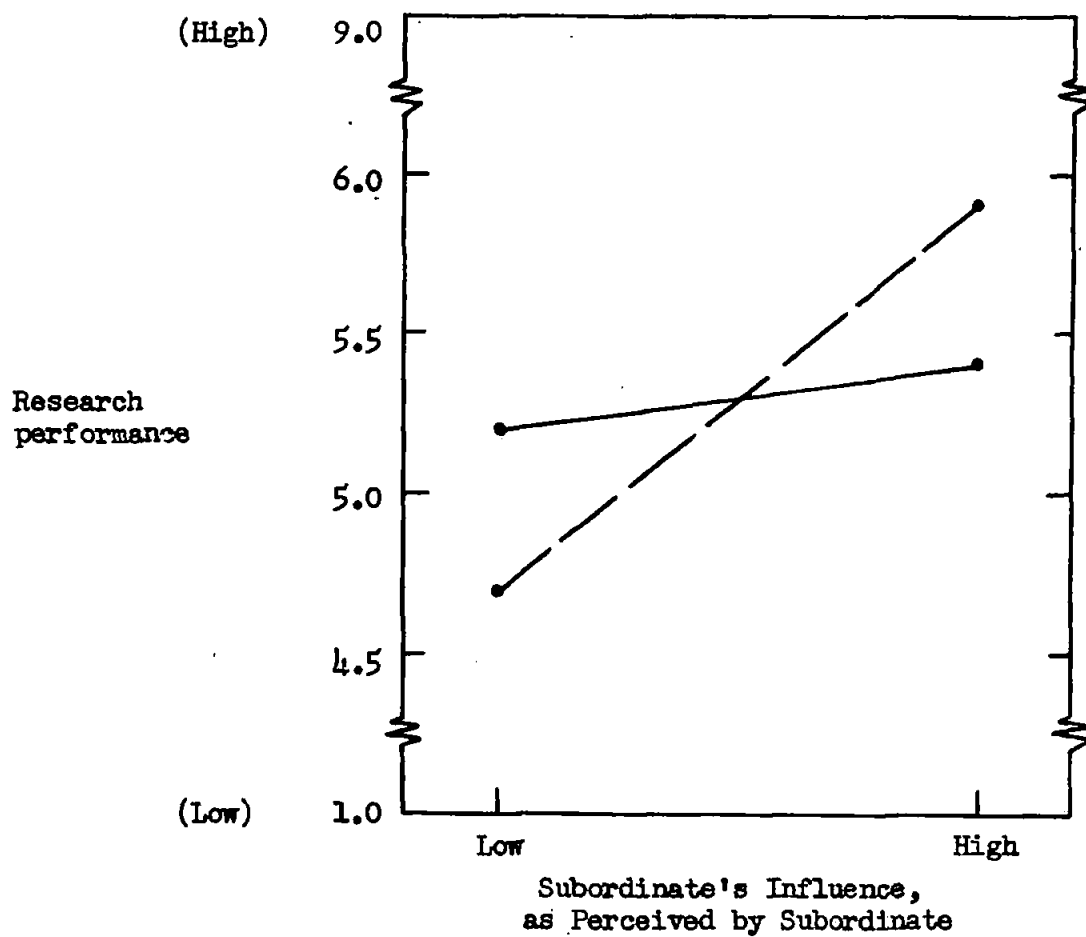
Decision-making about new research projects

Having considered the relation of subordinate influence to research performance in a general manner, let us turn to a specific decision-making situation. A question was asked (item 22):

*/ This conclusion is substantiated in Chapter II, when the same variables are related to communication.

FIGURE 1-5

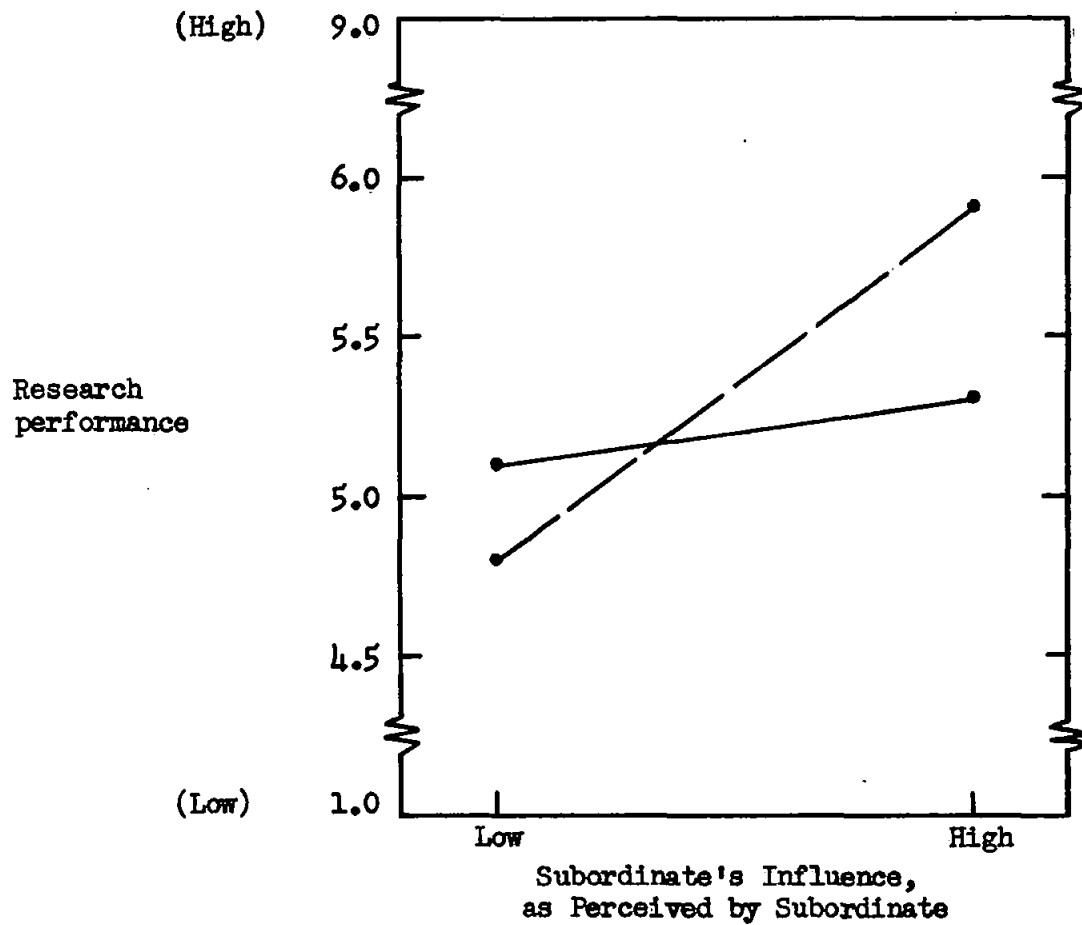
Influence of Subordinate and Confidence in
Chief's Motives, as Related to
Research Performance



<u>Degree of Confidence</u>	<u>t of difference</u>	<u>Level of significance</u>
High —————	0.06	Not sig.
Low — — — — —	2.67	.01

FIGURE 1-6

Influence of Subordinate and Enjoyment
of Contact with Chief, as Related to
Research Performance



<u>Degree of Enjoyment</u>	<u>t of difference</u>	<u>Level of significance</u>
High —————	0.5	Not sig.
Low ——— ———	2.68	.01

"What are the actual . . . relations between your chief and you, in determining what concrete work problems or assignments or follow-up steps you (or your staff) will work on next? . . . "

The four alternatives, in brief, were: */

- A. Subordinate makes such decisions himself, with the routine approval (if any) of the chief.
- B. Subordinate and chief jointly decide.
- C. Chief consults thoroughly with subordinate and then decides.
- D. Chief decides himself as he feels best.

Respondents rank-ordered the alternatives in terms of frequency of occurrence. By an analysis of the combinations of rank-orders, it was determined that the alternatives can be considered as lying along a single dimension; that is, the results permit the items to be arranged in the order shown above, from "non-directive" behavior of chief to "directive." If an individual's first choice is A, his next choice will nearly always be B, rather than C or D. Similarly, if an individual chooses D, his next choice will generally be C, rather than B or A.

By a method developed for this study, the rank-order data were converted into a seven-point scale. **/ For convenience, the dimension revealed by analysis of the rank-orders is called "directiveness" of chief.

Taking all researchers, irrespective of grade, the directiveness of the chief, as perceived by the subordinate, is related to performance. The more directive the chief the lower the research performance of the subordinate. This finding raises the question of cause and effect, but the analysis by grade which follows will tend to clarify this problem.

It should be noted that 77% of the scientists report their chiefs to be in the 1-4 range of the directiveness scale. This fact points up a major characteristic of the supervisory structure of the organization: the bulk of the decisions in this work area are made by the

*/ On the questionnaire these alternatives appeared in the order C, D, B, A.

**/ The numerical scale has this general equivalence to the four alternatives:

1	2	3	4	5	6	7	.
A		B			C	D	

The midpoint, 4, contains some tied scores.

subordinate alone, or jointly with the chief. */

Directiveness
by grade

Figure 1-7 shows the directiveness data, by grade, as related to performance. The directiveness scale had to be collapsed because of insufficient numbers toward the directive end. It was collapsed in such a way as to preserve the qualitative distinctions: subordinate decides, joint decision, and chief consults or decides. In effect, a three-point scale was made from the seven-point scale. The groups shown on the graph include two groups of non-chiefs: those at GS-9 and 11, and those at GS-12 and above (all of whom, it will be recalled, have doctoral degrees). Unit chiefs were made a separate category, but section chiefs were omitted. The decision not to show section chiefs was based on the observation that decisions about their work do not center primarily on their own personal research assignments.

Figure 1-7 indicates an interesting difference in performance by grade. The non-chiefs at GS-9 and 11 have their peak performance under conditions of joint decision-making, do somewhat less well under complete autonomy and below average under the more directive conditions. These variations are statistically significant. In contrast, non-chiefs at GS-12 and above show no significant difference in performance under the three conditions. This does not necessarily imply that all three conditions are equally enjoyable; it is rather that they are not markedly related to performance. The unit chief, finally, shows a performance curve inversely related to directiveness to a significant degree. **/

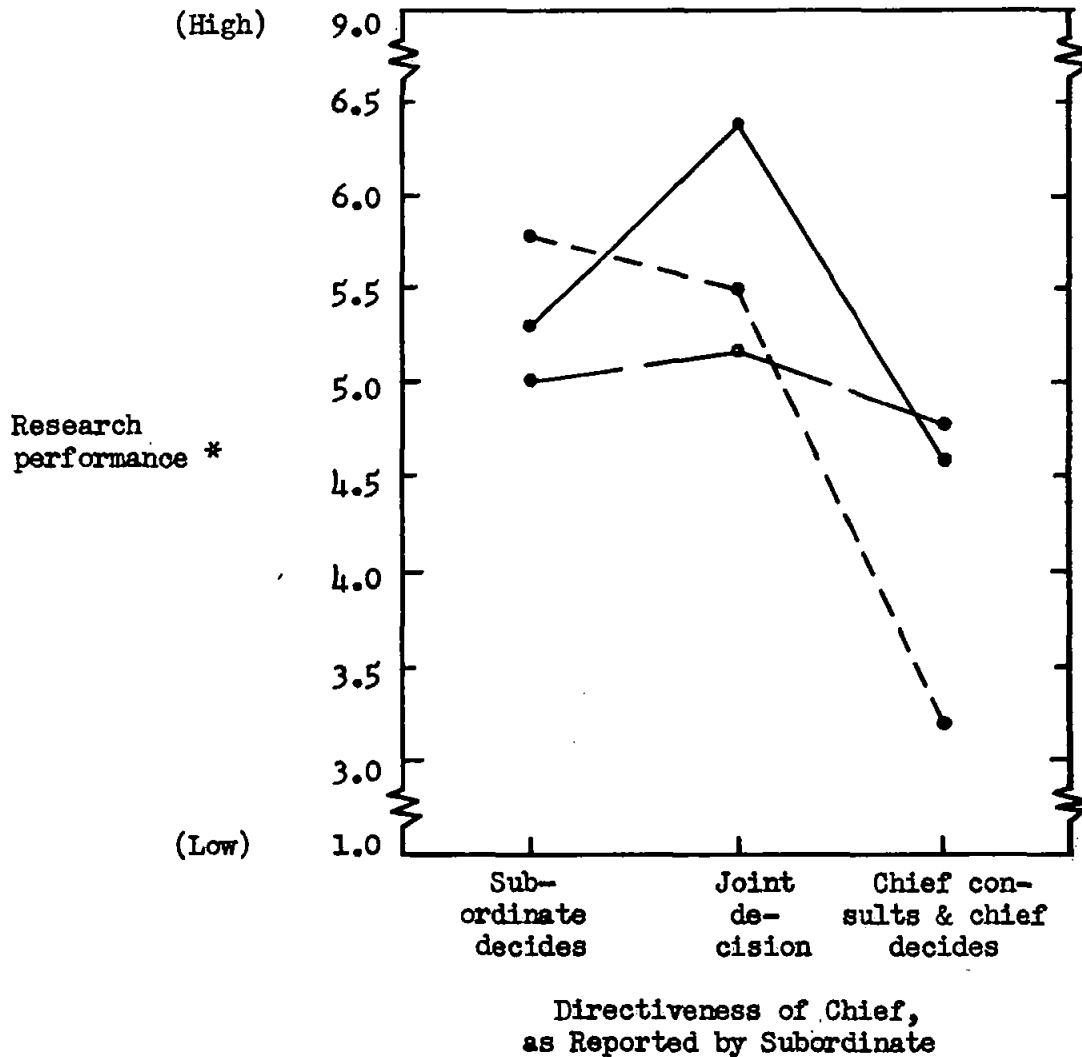
Again the complexity of the supervisory process is emphasized by these data. Here the necessity for flexibility of behavior seems to be the central theme. There appears to be a need to progress from joint decision-making at the beginning levels to autonomy at the higher grades, especially in the latter case when supervisory responsibilities are involved. It becomes abundantly clear that problems of supervision are not necessarily all solved by adopting a laissez-faire approach. The prime consideration appears to be that the degree of "directiveness" must be suited to the needs of the particular scientists involved.

*/ See Human Relations in a Research Organization, pp. 148-152 and 275-279 for additional data.

**/ Ibid., page 279, Figure 8-2 shows roughly parallel results from the earlier high-low performance scaling.

FIGURE 1-7

Directiveness of Chief in Work Decisions,
as Related to Research Performance, by Grade



<u>Grade</u>	<u>F ratio</u>	<u>Level of significance</u>
———— GS 9-11, non-chief	5.12	.05
—— ——— GS 12+, non-chief	0.10	Not sig.
- - - - - Unit chief	6.35	.01

* Because the performance measure is controlled for grade the lines show performance high or low relative to a specific grade; no comparisons of the levels of the three lines to each other is legitimate.

Subordinate influence
by grade

An illustration of the point that the "same" supervisory behavior has different consequences on different groups of scientists is afforded by Figure 1-8. Here we go back to the subordinate's perception of his influence with his chief. We see that only for the scientists at GS-9 to 11 is degree of influence significantly related to performance; the more influence, the higher the performance. That is, the performance of these scientists is closely connected to the degree of influence accorded them by the chief. At the same time, to judge from previous data, influence does not mean complete autonomy, but rather a share in joint decisions. It appears that the effects we have been analyzing are particularly relevant in the supervision of the scientists at the bottom of the grade hierarchy.

Sense of belonging
and research performance

There are other interpersonal variables which bear on research performance. Thus far, however, none of them appears to be as important as the supervisory factors we have just outlined.

One factor, sense of belonging to the organization, has played a part in previous studies in other settings. Part of the analysis of research performance was therefore planned along this line.

Identification with the organization, or part of it, is generally considered one aspect of "morale." Sense of belonging to the organization or group is the general meaning in which identification is used here.

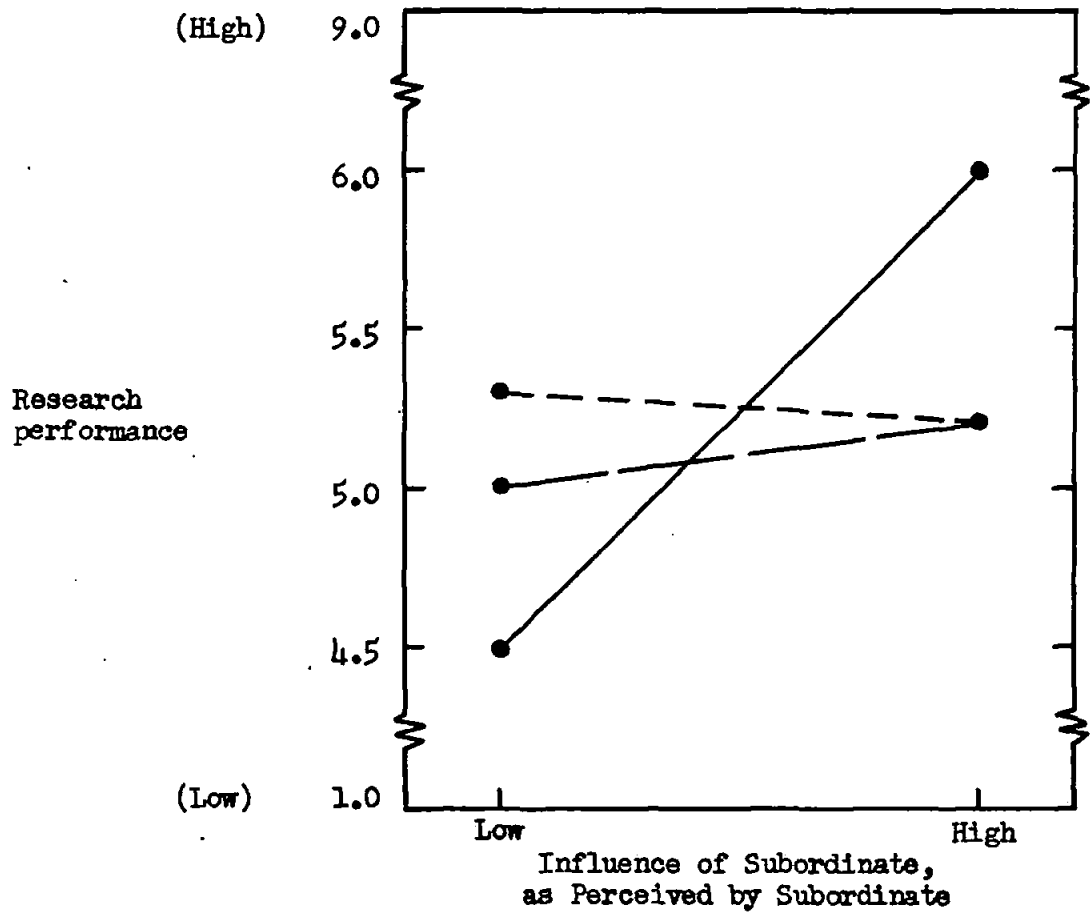
The analysis of the sense of belonging to section, laboratory, and institute shows interesting trends, but none of the relationships goes beyond marginal statistical significance. However weak statistically, they do shed some light, as a few trends will show.

There is a consistent but slight tendency for performance and sense of belonging to be positively related at the section level, unrelated at the laboratory level, and inversely related at the institute level. In general then, high section belonging goes with slightly higher performance, and high institute belonging with slightly lower performance.

This would seem to imply that identification with immediate work group is a factor related to performance, and, perhaps that identification at more than one level is not desirable. The first hypothesis is supported in that performance is positively (but not significantly) related to degree of identification with the smallest, the most immediate work group (whether unit, section, or small

FIGURE 1-8

Subordinate Influence by Grade,
as Related to Research Performance



<u>Grade</u>	<u>t of difference</u>	<u>Level of significance</u>
———— GS 9-11	3.49	.001
—— — GS 12	0.40	Not sig.
- - - GS 13 +	0.02	Not sig.

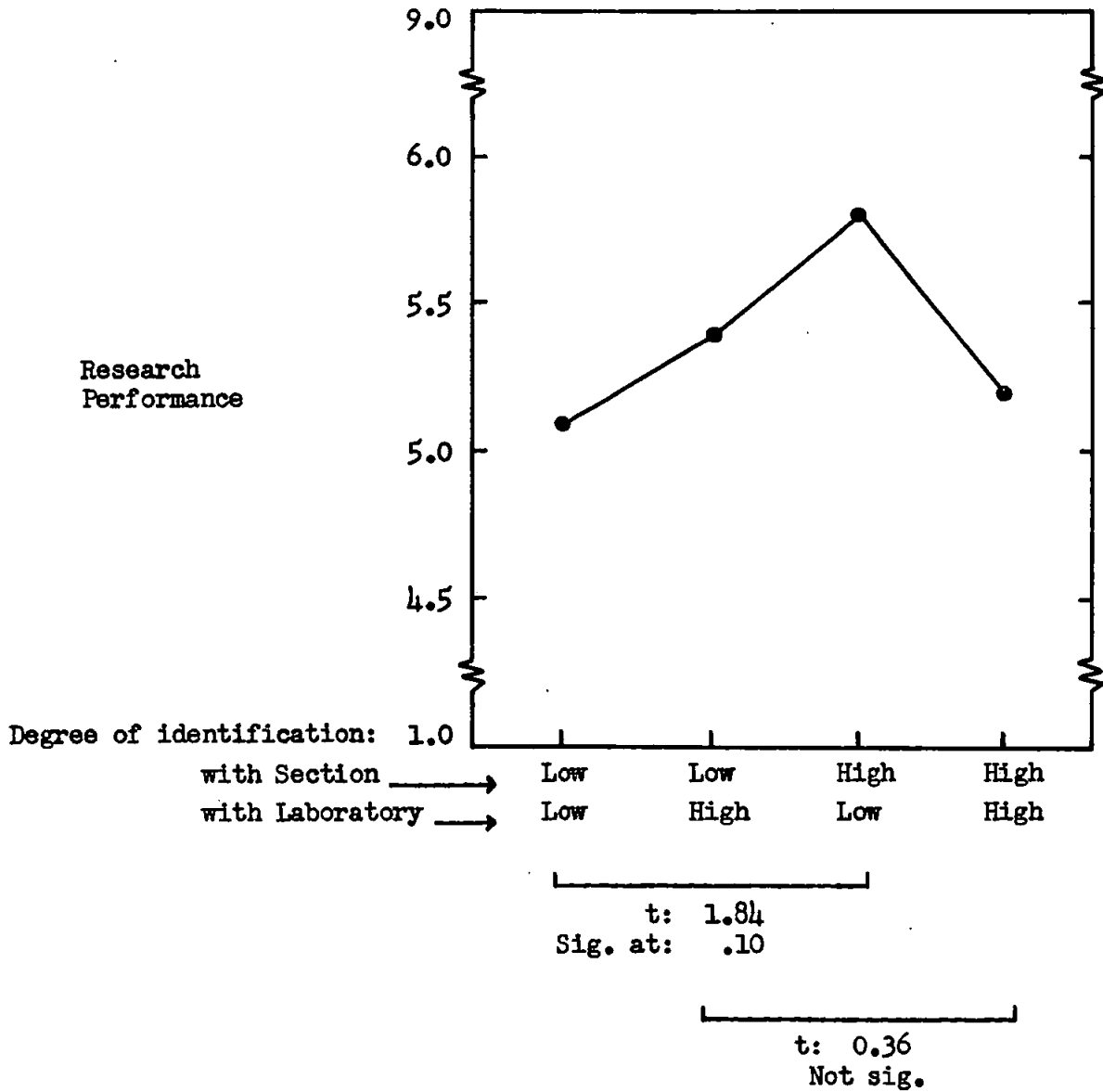
laboratory). As Figure 1-9 indicates, high belonging to section tends to be positively related to performance only under conditions of low belonging to laboratory.

The implication of this finding appears to be that it is more important to feel part of the immediate group which forms the interpersonal setting for research, than of the larger or broader levels of the organization. Identification with the work group may reflect the involvement with a specific scientific problem to be solved in this group. In general, group attitudes and characteristics are found to be only moderately related to research performance. Data which are not presented here contain leads which will be followed up in later analyses. */

*/ In addition, data bearing on the characteristics of group attitudes at the laboratory level are presented in Chapter IV.

FIGURE 1-9

Identification with Section and Laboratory,
as Related to Research Performance



C. Summary

The analysis presented in this chapter was designed to examine research performance in relation to the social setting in which the scientist operates. More specifically, we were interested in determining what interpersonal factors facilitate or inhibit the scientist in translating his motivation toward research into actual research performance.

To begin with, motivation as such was examined. Two motivational dimensions were set up, on the basis of measures of orientation toward two sets of goals potentially available to the scientist in his role of researcher in a large organization. These were the science and the institutional orientations. High performance is associated with high science motivation, but this is not the whole story. High science motivation may be checked to some degree by conflicting motivation toward institutional goals.

Next the analysis proceeded to examine the situations in which these motivations are translated into performance. In studying the interpersonal setting, one area stood out as meriting major emphasis -- that of chief-subordinate relations. Within this area, the factor of subordinate's influence -- his degree of control over the chief's decisions affecting his work -- was found to be highly important, and to have either facilitative or defensive functions. High science motivation apparently is facilitated by a high degree of influence. On the other hand, in chief-subordinate relations marked by some negative feeling (such as lack of confidence in the chief), a high degree of influence apparently has a defensive function as well. In view of these relationships it seems safe to interpret the role of influence as that of a necessary condition to effective performance, rather than a reward for high performance.

In a more specific influence situation -- decision-making about new research projects -- it was clear that there are distinct patterns of performance linked to the degree of directiveness exerted by the chief at different grade levels. In the lower grades somewhat less than complete autonomy is associated with the peak of performance, but at higher grades freedom to make work decisions is related to high performance.

The findings as a whole indicate the complexity of the supervisory process, and point to a need for flexibility of behavior within it, particularly in terms of the motivations and research experience of the scientist. The laissez-faire approach to supervision does not solve all the problems involved.

Preliminary examination of evidence concerning sense of belonging as it affects performance indicates that identification with the small work group has more relationship to performance than has identification with broader levels of the organization. Further analysis is necessary to explore fully the meaning of 'belongingness' and to integrate it with the other variables.

CHAPTER II

INTERPERSONAL FACTORS ASSOCIATED WITH EFFECTIVE COMMUNICATION AT NIH

Glen D. Mellinger

A. Hypotheses and Methods

Introduction

In the questionnaire form which was given to all intramural research professionals at NIH, one of the questions asked was:

"In your opinion, is the basic (non-clinical) research program of NIH likely to benefit or to suffer as a result of the clinical research program?"

Each person answering the questionnaire was asked to express his own opinion on this issue, to estimate how each of several other persons within his own laboratory or institute felt about the same issue, to indicate whether he ever had discussed the issue with each of these persons.

Taking only those persons who reported having discussed the issue, we found that when the opinion of the person making the estimate agrees with that of the person whose opinion is being estimated, 88% of the estimates are accurate (to within one point on a 5-point scale). But when the two persons disagree, the proportion of accurate estimates drops to 30%!

We all know from personal experience that people occasionally come away from a discussion with a completely mistaken impression of the others' opinions. We know, too, that discussions or meetings do not always lead to agreement; sometimes they only seem to extend the area of disagreement. What accounts for these breakdowns in communication?

Questions of this kind have led social psychologists to turn their attention to the processes by which people attempt to arrive at agreement and mutual understanding on matters of common concern. The research project to be reported in this chapter was undertaken primarily as a problem in theoretical social psychology. At the same time, we hope that it will be of practical interest

to persons who have a responsibility for effective communication.

At the outset, we should specify what we mean by the term "communication." Throughout this chapter, "communication" will refer simply to informal or face-to-face discussion between two people about an issue of common concern. As used in this sense, it is to be distinguished from such formal communications as announcements and memoranda. We are interested in communications which involve the mutual exchange of opinions, instead of those characterized by one-way transmission of information.

In focussing attention on this kind of communication, we do not intend to deny the importance of formal or one-way communication. At the same time, many studies have demonstrated the significance of day-to-day discussions in influencing the opinions which people hold about their jobs, about the people they work with, and about goals of the organization. The success of cooperative effort requires some degree of common perceptions about the organization and its goals. It therefore becomes important to learn more about the processes of informal communication, and about the impact which these processes have on opinions and perceptions.

What determines the effectiveness of communication?

We may think of informal communication as being more or less effective, depending on the extent to which it promotes either or both of the following: (1) actual agreement between two people, and (2) the accuracy with which each is able to perceive the opinions of the other. The nature of the study made it impossible actually to observe discussions and the resulting changes in agreement and accuracy. However, it was possible to ask people if they had communicated, and then to note the end results. For example, are people who have communicated more accurate in perceiving each other's opinion than those who have not? Is there more agreement among people who have communicated than among people who have not? And finally, what factors influence the effectiveness of communication in bringing about these results?

It is clear that many factors underlie the effectiveness of communication. Persuasiveness, knowledge of the subject, intelligence -- all these play a part. However, when we observe that intelligent and well-informed people of good will are often unable to agree, or even to understand each other's position, then we must conclude that additional factors are operating.

Earlier studies have shown that the effectiveness of communication also may depend on the way people feel about each other. The findings presented in the first two paragraphs suggest two possibilities.

In the first place, people may be reluctant to recognize that others disagree with them. Further, when we like somebody a great deal we may be especially inclined to assume that their opinions agree with our own. Hence when people we like disagree with us, we are likely to find it difficult to perceive their opinions accurately. Accordingly, one of the hypotheses we will investigate in this chapter is that:

- I. If one person feels strong liking for another, he will be reluctant to recognize disagreement between himself and that person; accuracy of perception will be impaired. */

In the second place, under some conditions a person may be reluctant to express his opinion when he knows it conflicts with that of the other person. This, obviously, is another potential source of inaccuracy. If you do not communicate your real opinion to me, I am not likely to perceive it accurately.

Under what conditions are we apt to find this reluctance to express one's real views? One possibility is that if two people lack confidence in each other, each may be hesitant about expressing his opinion on a controversial issue, and each is likely to come away with an inaccurate impression of the other's views. This effect should be more pronounced when people disagree than when they agree. In short, our hypothesis is that:

- II. The less confidence one person has in another, the more reluctant he will be to express an opinion which conflicts with that of the other; the accuracy of the latter's perception will be impaired accordingly.

Hypotheses I and II deal with mutual understanding, or accuracy of perception. In addition, we were interested in investigating the possibility that the effectiveness of communication in bringing about agreement between two people also may depend on their feelings toward each other. Previous studies have shown that people are less willing to accept the opinions of those they dislike than of those they like.

*/ A similar hypothesis can be made if there is strong disliking, which may also impair accuracy. With our data, however, it was not possible to test this.

A third hypothesis is that:

- III. Discussion between two people who like each other a great deal will be more apt to result in agreement than discussion between people whose liking for each other is less strong.

One note of caution is in order. These hypotheses have been stated as if liking, for example, "causes" agreement or understanding. In fact, liking may be associated with agreement (that is, similarity of opinions) for either or both of two reasons: because we are more inclined to accept the opinions of people we like, or because we tend to develop feelings of attraction toward people who agree with us. In either case, the concrete prediction remains the same.

How the data were obtained

After deciding on the research problem, the next step was to select some issue about which there were important differences of opinion at the time the survey was made in October, 1952. The Clinical Center issue was chosen because it had been the subject of a great deal of discussion, and because the problems associated with the new clinical research program were seen as vital to the future of NIH. Accordingly, all intramural professionals were asked (Question 28):

"The Clinical Center will, of course, provide for a laboratory program of clinical research -- as contrasted with the basic or non-clinical research activities now going on in most of the Institutes' Laboratories."

"In your opinion, is the basic (non-clinical) research program of NIH likely to benefit or to suffer as a result of the clinical research program? (Please make an estimate, even if you are not sure.)"

The distribution of the responses of 330 intramural professionals is shown in Table 2-1. Approximately one-third of the scientists express concern over the probable impact of the clinical program on basic research, while about one-half express optimism. Relatively few express a neutral or pro-con attitude.

TABLE 2-1

Expectations Regarding Probable Impact
of Clinical Center Research Program
on Basic Research at NIH
(as reported by intramural professionals)

<u>Response categories</u>	<u>Number of res- ponses (N)</u>	<u>%</u>
The basic research program:		
1. Is likely to suffer substantially as a result of the clinical research program....	37	11%
2. Is somewhat more likely to suffer than benefit, on the whole....	78	24
3. Is about equally likely to benefit or suffer (pro-con)....	50	15
4. Is somewhat more likely to benefit than suffer, on the whole....	74	22
5. Is likely to benefit substantially as a result of the clinical research program....	83	25
Not ascertained:	8	2
	<hr/>	<hr/>
Total:	330	99%

To obtain the required data, it was necessary to identify specific pairs of individuals at NIH, and then to characterize each pair with respect to the following variables:

- a) the degree of similarity (agreement) between their respective opinions about the likely impact of the Clinical Center on the basic research program of NIH;
- b) the degree of accuracy with which each member of the pair is able to estimate the opinion of the other on this issue;
- c) the extent to which the two persons report having discussed the allocation of resources within the Clinical Center (communication);
- d) the degree of liking expressed by the two persons toward each other; and
- e) the degree of confidence or trust expressed by each member of the pair toward the other.

We used the following procedures. First, on the questionnaire form which was filled out by intramural professionals, respondents were asked to list the names of up to seven other people at various levels within their own laboratory or institute (Question 9). The seven persons to be named were: the respondent's chief, the person above his chief, any other person to whom the respondent reported, a colleague at the respondent's own level and working under the same chief, and three people at various levels working under the respondent.

Next, several questions designed to obtain the above information were inserted at various points in the questionnaire, and respondents were asked to answer these questions in terms of each of the persons they had named previously. The following items served as the basis for the communication, liking, accuracy, and confidence variables respectively:

"How often have you discussed with each of the following people the way the various resources of the Clinical Center (facilities, space, etc.) are to be allotted for various purposes? Please try to estimate how often, even though you are not sure." (Question 29).

"How strongly do you enjoy your contacts with each person -- whether you like him personally, gain professional stimulation from him, or enjoy contacts with him for any other reason?" (Question 12).

"In Question 28 we asked you if you think the basic research program of NIH is likely to benefit or to suffer as a result of the clinical research program. How do you think each of these people would answer this question? (Make an estimate, even if you are not sure how the person would answer.)" (Question 34).

"To what extent do you have confidence in this person's intentions and motives? Do you feel he is always sincere in his dealings with others? Does he really mean what he says?" (Question 13).

Finally, we pulled out all those cases where two individuals named each other on their respective questionnaires. In all, 186 such pairs were obtained, although not all of these could be utilized in the analysis because of incomplete data on one or more of the variables we were interested in studying.

B. Communication, Liking and Actual Agreement

We shall first consider data regarding actual agreement, rather than accuracy of perceptions.

Measures

Since we had obtained the opinions of all respondents on the Clinical Center issue, it was a simple matter to assign an Agreement Score to each of the pairs identified by the process described above. If the responses of the two members of the pair were identical, the pair was given an agreement score of 0 (that is, no disagreement); if the responses differed by one response category, the pair was given an agreement score of 1, and so on. Maximum disagreement was represented by a score of 4.

Next, we characterized each pair in terms of the liking expressed on Question 12. Since the bulk of the responses fell in the "very strong" and "fairly strong" categories, we divided them into two roughly equal halves. The "very strong enjoyment" responses were labeled STRONG LIKING. The remaining responses, which expressed less than very strong enjoyment, were combined and labeled MILD LIKING.

We then separated pairs into three types: those in which both members expressed strong liking for each other (MUTUAL STRONG LIKING); those in which both expressed a relatively low degree of liking (MUTUAL MILD LIKING); and those in which one member

expressed strong liking and the other mild liking (MIXED LIKING).

And finally, we used Question 29 to determine whether the members of each pair ever had discussed the operation of the Clinical Center. */ In preliminary analyses we discovered that the principal differences occurred between those who had discussed this matter -- whether "once or twice," "a few times," or "many times" -- and those who had never discussed it at all. Accordingly, for the purpose of the present research, we have distinguished only between pairs which report communication and those which do not.

Findings

We now have the data we need to test hypothesis III given above. Before doing so, however, it might be interesting to see whether, in general, people who have discussed the issue agree more often on the average than people who have not. As we could expect, Figure 2-1 shows quite clearly that they do. The pairs which report that they have not discussed the Clinical Center disagree (on the average) to the extent of 1.65 response categories, whereas pairs which report that they have discussed it disagree only 1.26 categories. Statistically, this difference could have occurred only 5 times out of 100 by chance alone; the difference is "statistically significant at the .05 level of confidence." From these data it seems likely that, in general, communication between two people about an issue promotes agreement between them.

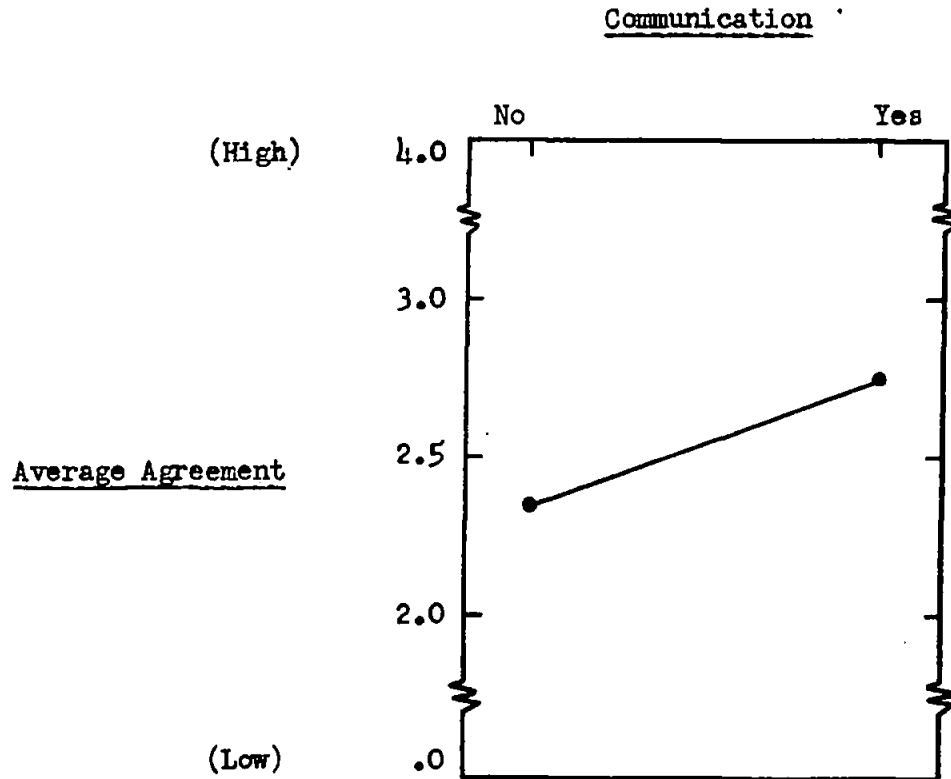
Similarly, Figure 2-2 shows that agreement is higher, on the average, in pairs which report mutual strong liking than in pairs which report mutual mild or mixed liking. The absence of strong liking seems to reduce the likelihood that two people will have similar opinions on this issue.

But what we really want to know is: do the attitudes of two people toward each other influence the effectiveness of communication in promoting agreement between them? Does it continue to hold true that agreement increases with communication, when we distinguish between pairs characterized by mutual strong, mutual mild, or mixed liking?

*/ We considered several alternative wordings for this question, some of which would have referred more specifically and others less specifically to the Clinical Center issue. We finally settled on the wording in Question 29 which seemed to combine the advantages of the most specific and least specific alternatives.

FIGURE 2-1

How Communication Between Two People About an Issue
is Related to Agreement on the Issue
(for 153 pairs of intramural professionals) *



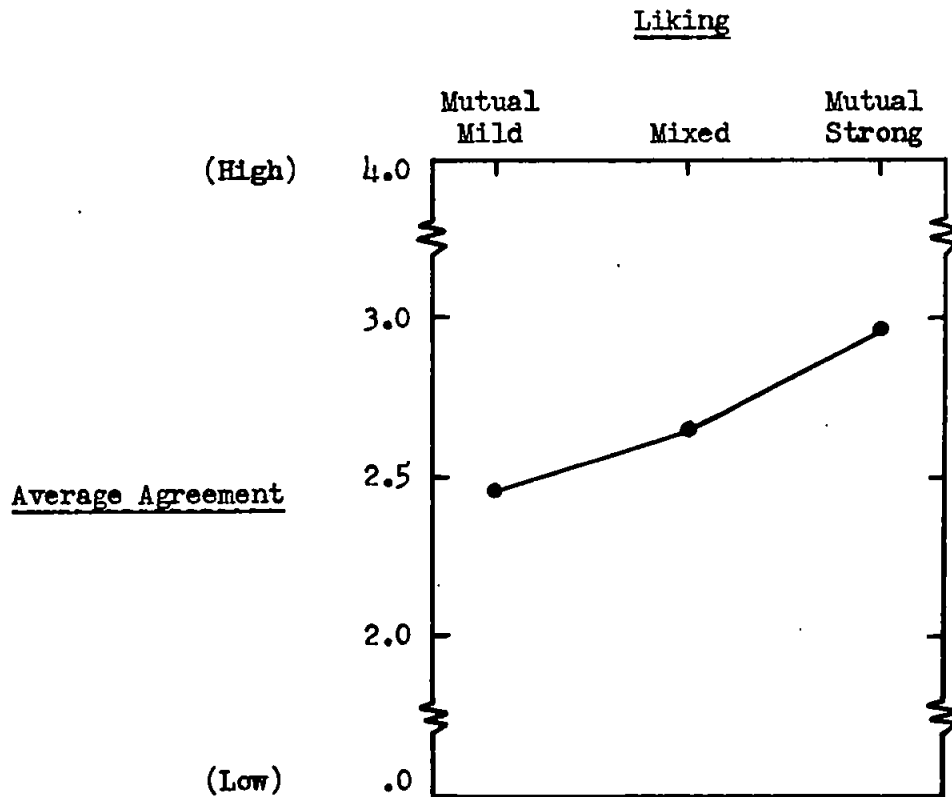
<u>Number of cases</u>		<u>t of difference</u>	<u>Significance of difference</u> **
<u>No Comm.</u>	<u>Comm.</u>		
40	113	2.04	.05

* In the figures which follow, each dot represents the mean score for a group under a specified condition. The dots are connected by a straight line simply to aid in visualizing the direction of the relationship.

** A significance level of .05 means that the obtained difference has only a 5% probability of being due to chance alone.

FIGURE 2-2

Relationship Between
Mutual Liking and Agreement
(for 153 pairs of intramural professionals)



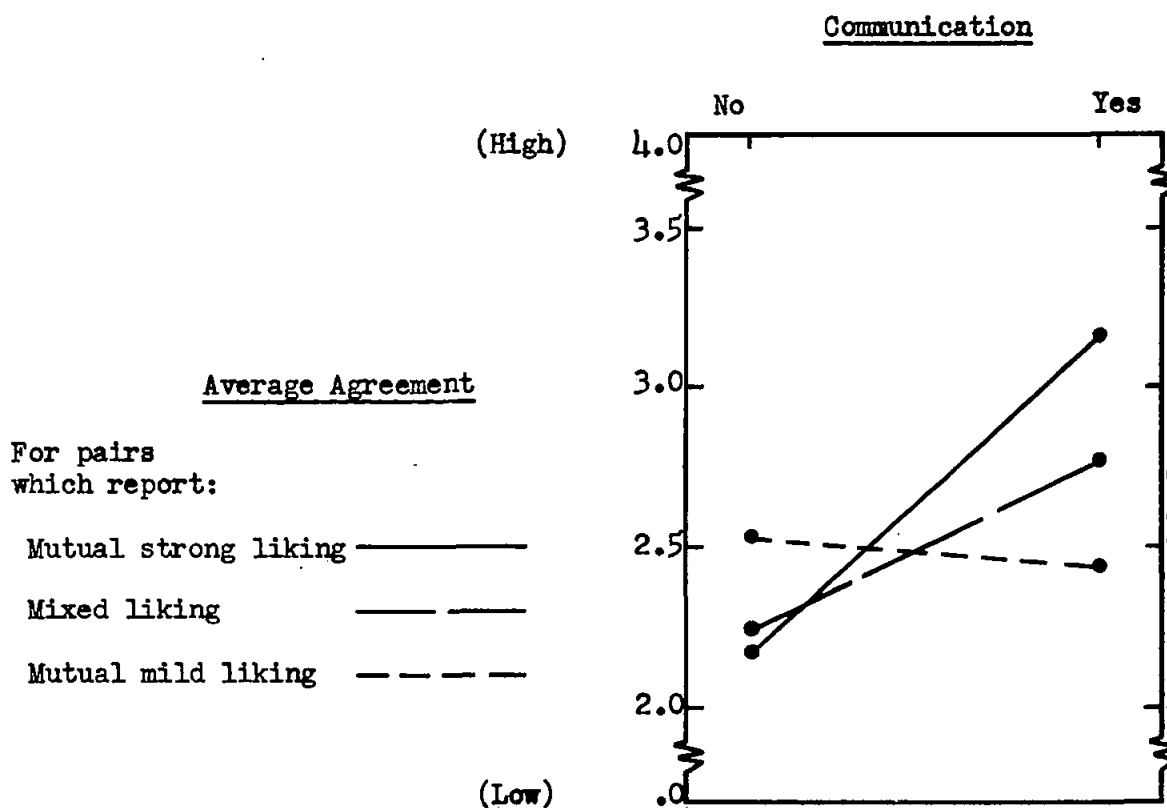
<u>Number of cases</u>			<u>t of difference</u>	<u>Significance of difference</u>
<u>Mutual mild liking</u>	<u>Mixed liking</u>	<u>Mutual strong liking</u>		
56	66		Not signif.	Not signif.
56		31	2.23	.05
	66	31	1.45	.20

Figure 2-3a shows that the way two people feel about each other definitely is related to the effectiveness of communication in increasing agreement. When there is mutual high liking, average agreement is higher in pairs which have discussed the Clinical Center than in pairs which have not. But when there is mutual low liking, agreement is no higher for pairs which have communicated than for pairs which have not. These findings support the hypothesis that communication is more likely to produce agreement between two people with strong liking for each other than between people whose liking for each other is "mild" or "neutral".

An interesting hypothesis for future research might be that when two people dislike each other strongly, communication is apt to result in increased disagreement.

FIGURE 2-3a

Relationship Between Communication and Agreement,
Controlling on Mutual Liking
(for 153 pairs of intramural professionals)

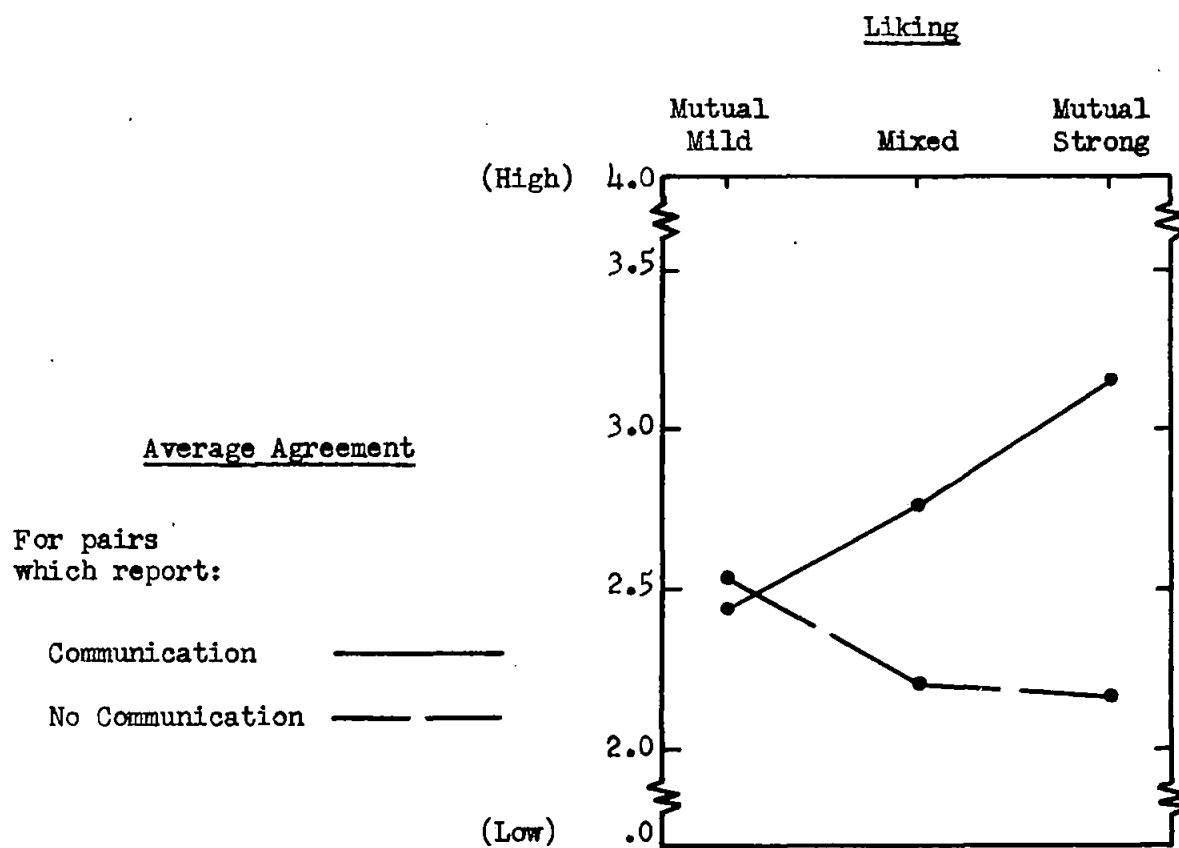


<u>Condition</u>	<u>Number of cases</u>		<u>t of difference</u>	<u>Significance of difference</u>
	<u>No Comm.</u>	<u>Comm.</u>		
Mutual strong liking	6	25	2.29	.05
Mixed liking	15	51	1.83	.10
Mutual mild liking	19	37	.34	Not signif.

And finally, the data in Figure 2-3a also can be used to show how mutual liking is related to agreement, under the two conditions of communication. This is done in Figure 2-3b. We find that agreement is significantly higher in pairs which report mutual strong liking than in pairs which report mutual mild liking, but only when there is communication. In the absence of communication, liking is not related to agreement.

FIGURE 2-3b

Relationship Between Mutual Liking and Agreement,
Controlling on Communication
(for 153 pairs of intramural professionals)



<u>Condition</u>	<u>Number of cases</u>			<u>t of difference</u>	<u>Significance of difference</u>
	<u>Mutual mild liking</u>	<u>Mixed liking</u>	<u>Mutual strong liking</u>		
Communication	37	51		1.47	.20
"	37		25	2.91	.01
"		51	25	1.67	.10
No Communication	19	15		_____	Not signif.
"	19		6	_____	Not signif.
"		15	6	_____	Not signif.

C. Communication and Accurate Perception of Others' Opinions

Next we consider the accuracy with which individuals are able to perceive the opinions of others.

Measures

At this point, it is necessary to introduce a terminological distinction between the two members of each pair.

We will use the term Subject to refer to a respondent when we are concerned with his estimate of another's opinion.

We will use the term Other to refer to a respondent whose opinion is being estimated.

In order to get a measure of perceptual accuracy, we simply compared Subject's estimate of Other's opinion (see (b) on page 6), with the opinion actually expressed by Other on his own questionnaire. It was possible to make this comparison in 244 cases.

The system used for scoring Subject's accuracy was similar to the one used for scoring objective agreement. If Subject's estimate was identical with the opinion actually expressed by Other, Subject was given an accuracy score of 0 (that is, no disparity between Other's opinion and Subject's estimate). If Subject's estimate differed from Other's actual response by one response category, Subject was given a score of 1, and so on.

The distribution of accuracy scores for 244 estimates is shown in Table 2-2. In one-third of the cases Subject's estimate coincided exactly with Other's opinion. But almost one-fourth of the estimates are substantially inaccurate -- i.e., they deviate by two or more response categories from Other's expressed opinion.

TABLE 2-2

Distribution of Accuracy Scores
(based on 244 estimates)

Subject's estimate of Other's opinion deviates from opinion actually expressed by Other by:	<u>Accuracy score</u>	<u>Number of estimates</u>	<u>%</u>
No response category (Maximum Accuracy)	0	80	33%
One response category (Moderate Accuracy)	1	104	43
Two response categories (Moderate Inaccuracy)	2	40	16
Three or four categories (Maximum Inaccuracy)	3,4	20	8
		<hr/> 244	<hr/> 100%

Overall, the average Subject is inaccurate by 1.01 response categories,

The problem is: how are the attitudes of Subject and Other toward each other going to influence Subject's accuracy in perceiving Other's opinion? We have postulated that Subject's accuracy will depend on two kinds of factors. Hypothesis I states that Subject's perception of disagreement will tend to be distorted by his liking for Other. Hypothesis II states that Other will be reluctant to express conflicting opinions if he lacks confidence in Subject. Earlier we described the use of responses on item (b) to distinguish between strong liking and mild liking. The final step was to make a similar distinction for the confidence item (d). The "always" responses were labeled HIGH CONFIDENCE. The remaining responses, which indicate that Other does not always have confidence in Subject, were combined and labeled LOW CONFIDENCE. It should be mentioned that few of the responses in the latter category indicate really strong distrust.

It also may be worthwhile to emphasize the distinction between liking and confidence as used in this study. As regards any particular pair, we are interested in Subject's liking for Other and in Other's confidence in Subject. Further, if we consider the liking and confidence responses of one individual toward another, the data show that these do not necessarily represent the same attitude. That is, it is quite possible for a person to like another strongly without having complete confidence or trust in him, and vice versa.

We turn now to the data on perceptual accuracy which are illustrated in Figures 2-4, 5, and 6.*

*/ In analyzing the data, we encountered the following problem. As we saw earlier, communication tends to be associated with high agreement. We also find that high agreement is strongly associated with high accuracy (data not shown). Therefore, when we examine the relationship between communication and accuracy, we find that it is higher than can be accounted for by communication alone -- due to the intervening link with agreement.

To cancel out this effect, the following procedure was adopted. The overall mean accuracy was computed separately for each level of agreement. All accuracy scores were then expressed as deviations from this point. Thus a zero score represents average accuracy under a specific level of agreement.

For example, under maximum agreement, overall mean accuracy = .47. For the same level of agreement, the mean for the "no communication" group = 1.33. Subtracting 1.33 from .47 we get -.86, or below average accuracy. With these adjusted scores, all levels of agreement can be combined and the effects of agreement on the relation between communication and accuracy will be cancelled out.

Findings on effect of
communication per se

In general, we would expect that Subjects who have communicated with Other about the Clinical Center will be more accurate in estimating Other's opinion than Subjects who have not. However the data in Figure 2-4 show that this generalization must be qualified to take account of the level of agreement between Subject and Other. We find that:

- (1) When there is maximum agreement between Subject and Other, Subjects who have communicated with Other are significantly more accurate in estimating Other's opinion than Subjects who have not.

This is in line with the usual expectation that accuracy in perceiving another person's opinion will improve as a result of communication with that person.

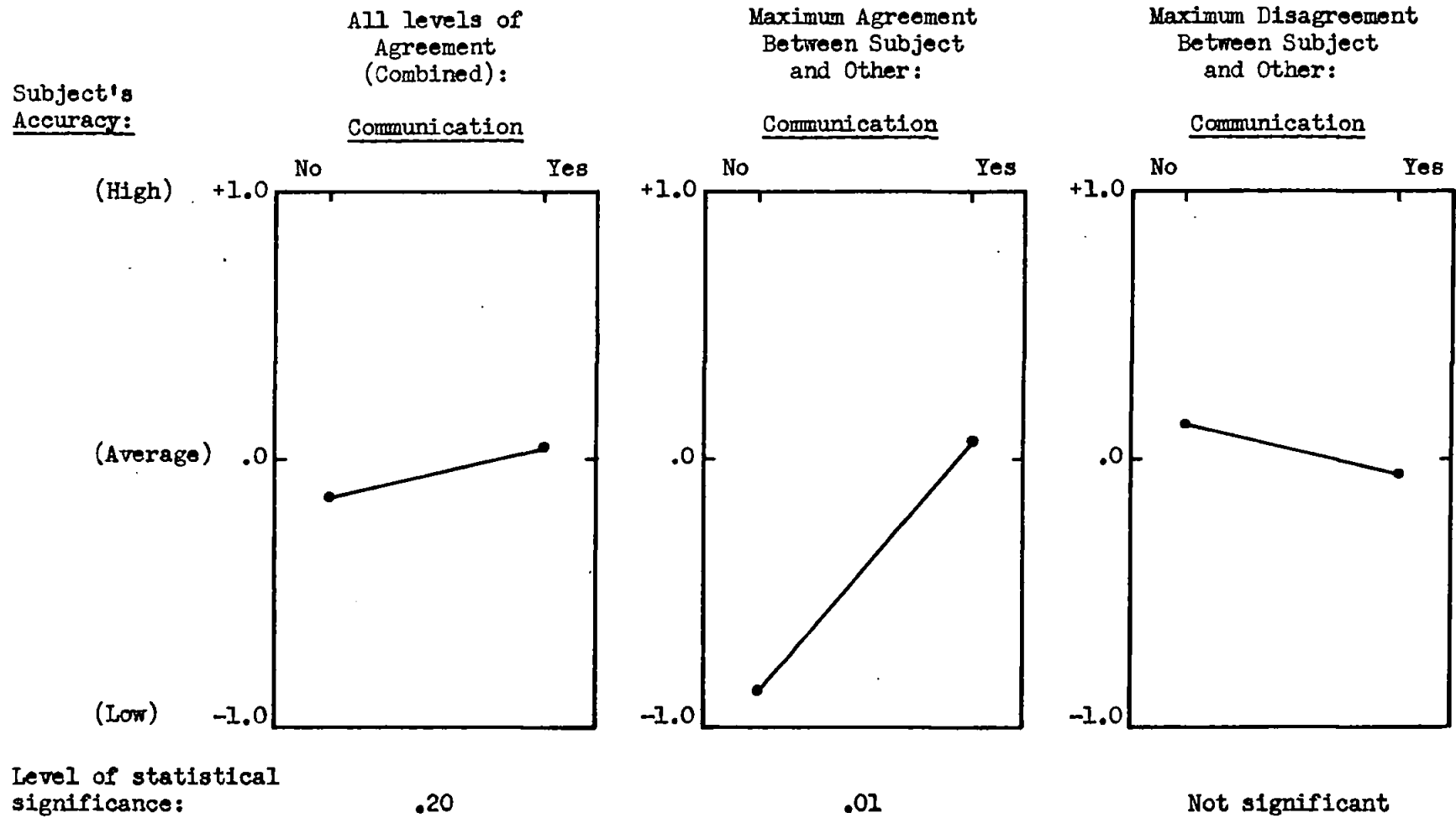
- (2) However, when there is maximum disagreement, Subjects who have communicated with Other are slightly less accurate than Subjects who have not. This difference is not statistically significant, and therefore should be interpreted with caution. Nevertheless, we can say with justification that in this case people who have discussed the Clinical Center are at least no more accurate in perceiving each other's opinion than people who have not.

The meaning of this finding should become clearer later on when we look at the effects of confidence and liking on the relationship between communication and accuracy.

- (3) As a consequence of (1) and (2), when we combine all levels of agreement, we find that communication is associated with only slightly greater accuracy than no communication.

FIGURE 2-4

How Communication with an Other is Related to
Subject's Accuracy in Perceiving Other's Opinion



Findings on liking as a factor
in effective communication

Hypothesis I stated that the more one person likes another, the more reluctant he will be to recognize disagreement between himself and that person. In terms of our data, we predicted that communication will be associated with increased accuracy when Subject feels only mild liking for Other. In contrast, when Subject feels strong liking for Other, his liking will make it hard for him to realize that he and Other disagree. Under these conditions, communication may lead to greater accuracy in perceiving agreement, but it will not improve accuracy in perceiving disagreement.

The data in Figure 2-5 tend to support these hypotheses. We find that:

- (4) When Subject feels only mild liking for Other, communication is associated consistently -- that is, regardless of level of agreement -- with increased accuracy. Even when there is disagreement, Subjects who have communicated with Other are slightly more accurate than those who have not.
- (5) But when Subject's liking for Other is strong, the relationship between communication and accuracy depends on the level of agreement between Subject and Other. Specifically,
 - (a) when there is substantial agreement, Subjects who have communicated with Other are slightly more accurate in estimating Other's opinion than Subjects who have not.

This supports the contention that strong liking denotes a desire to perceive agreement. Note that even Subjects who have not communicated with Other are reasonably accurate; they are correct in assuming agreement.

- (b) On the other hand, when there is disagreement, Subjects who have communicated with Other are no more accurate than Subjects who have not. */

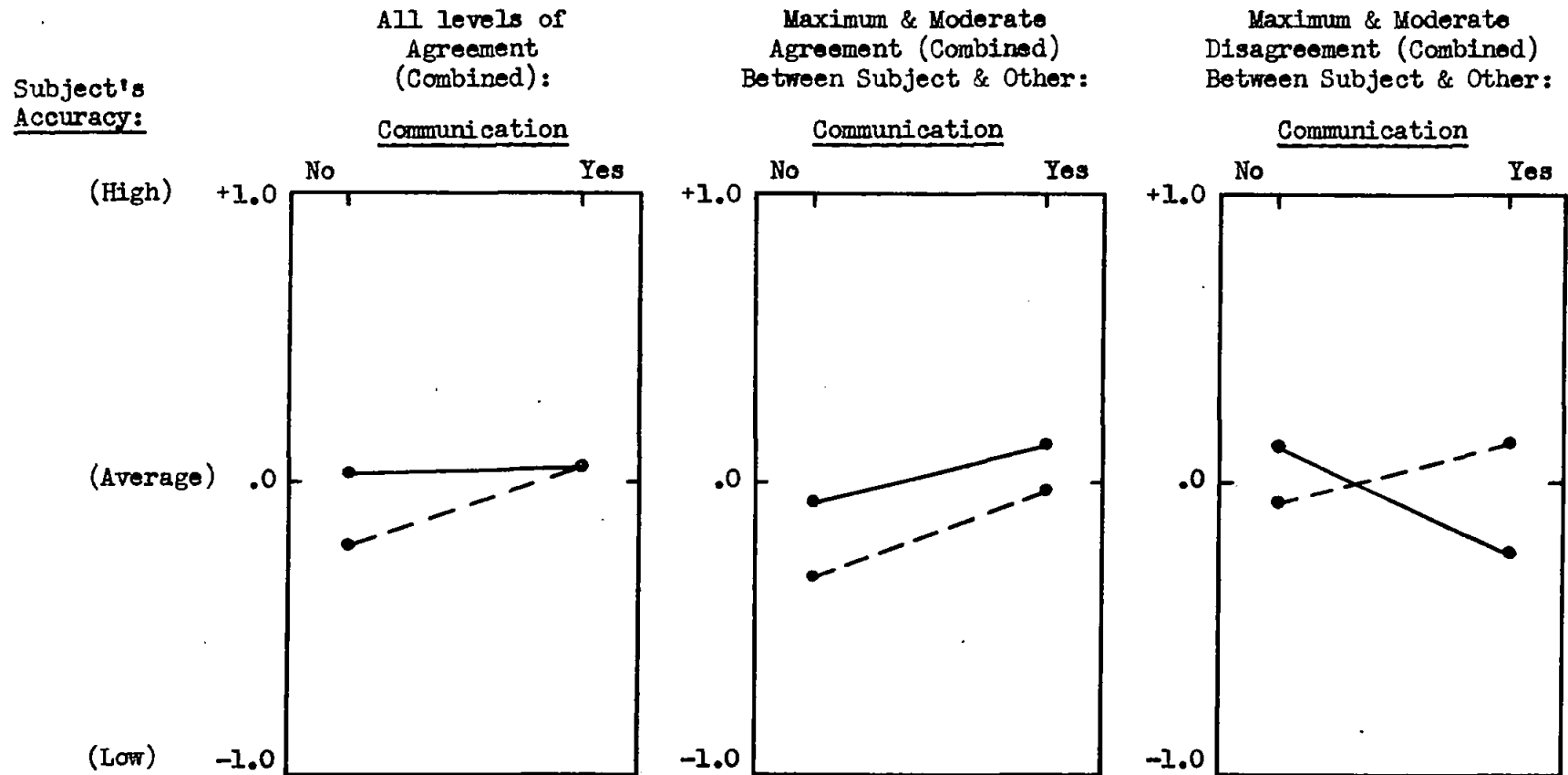
This is in line with our assumption that people find it difficult to perceive disagreement between themselves and those whom they like strongly, even when they have encountered disagreement in their discussions with them!

*/ In fact, those who communicate are slightly less accurate than those who do not.

FIGURE 2-5

How Communication with Other is Related to
Subject's Accuracy in Perceiving Other's Opinion

When Subject's liking for Other is strong ————— When Subject's liking for Other is mild - - - - -



Level of statistical
significance:

Strong liking

Not significant

Not significant

Not significant

Mild liking

.10

.10

Not significant

In any event, the important finding here is that communication between Subject and Other does not always produce greater accuracy in Subject's estimates of Other's opinion. Specifically, accurate recognition of another's divergent opinion is likely to be impaired by strong liking.

It is important to warn against concluding that strong disliking is conducive to effective communication. On the contrary, we would hypothesize that strong disliking, like strong liking, is apt to interfere with accurate perception. It may be that two people who dislike each other intensely will be loath to admit that they share the same opinions. However, we were unable to test this hypothesis since few of the responses to the liking item indicated aversion.

Findings on confidence as
a factor in effective communication

Hypothesis II stated that the less confidence one person has in another, the more reluctant he will be to express an opinion which conflicts with that of the other person. Thus if Other lacks confidence in Subject, communication between them may be actually misleading, as far as Subject's understanding of Other's real opinion is concerned.

In terms of our data, we predicted that communication will be associated with an increase in Subject's accuracy when Other has high confidence in Subject. However, when Other has low confidence in Subject, communication will be associated with increased accuracy only when there is substantial agreement between them.

The data in Figure 2-6 clearly support this prediction. The findings are that:

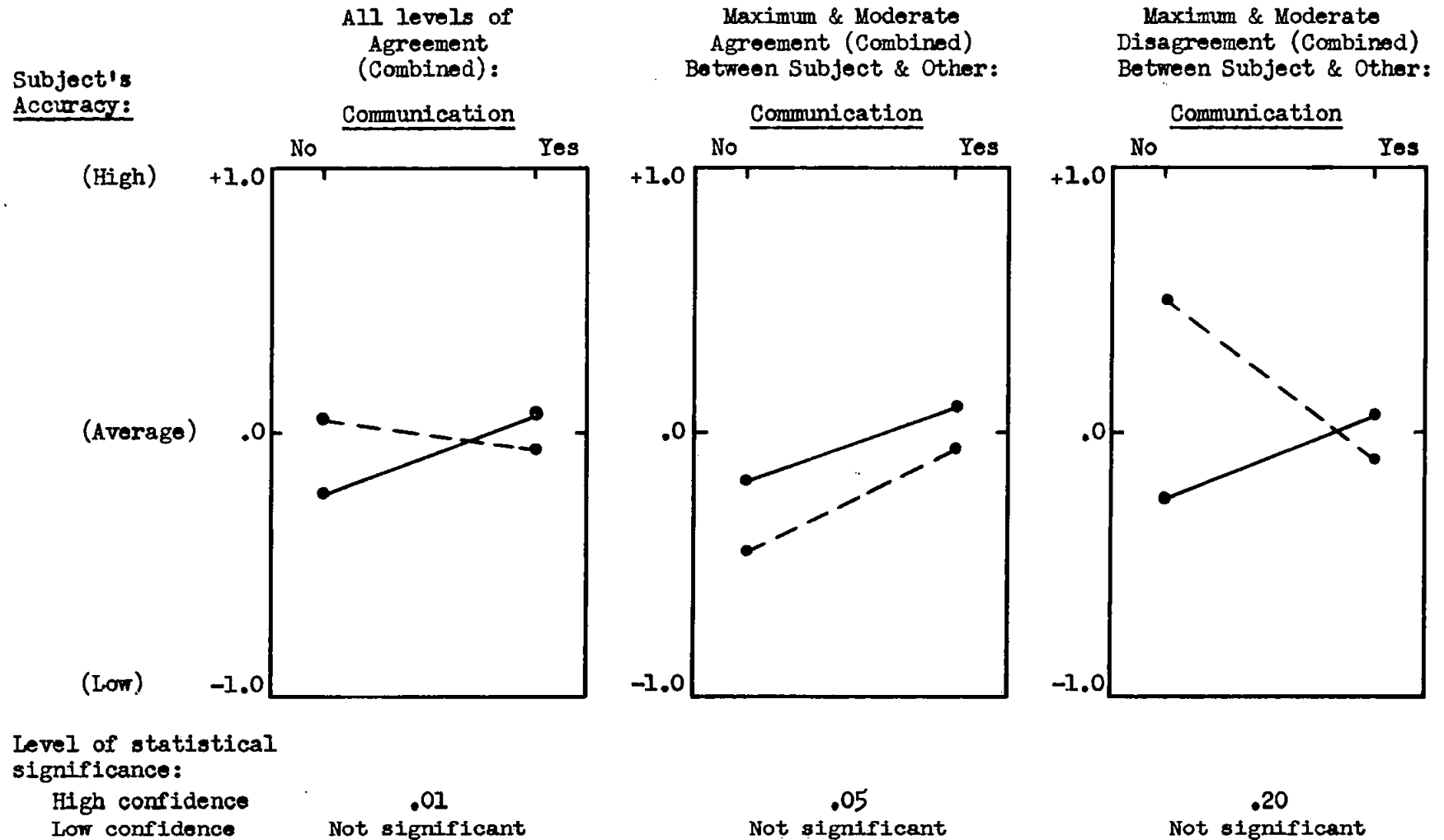
- (6) When Other's confidence in Subject is high, Subjects who have communicated with Other are consistently more accurate in estimating Other's opinion than Subjects who have not. High confidence seems to denote willingness to express one's opinions freely. Thus accuracy increases as a result of communication.
- (7) But when Other's confidence in Subject is low, communication does not seem to improve Subject's accuracy, even when there is substantial agreement. Given disagreement, communication is even associated with a slight decrease in accuracy.

We attribute this breakdown in the effectiveness of communication to Other's feeling that he cannot be perfectly candid in expressing his opinions to someone in whom he lacks confidence. Data which do not appear in this report lend additional support to this interpretation. Subject may be inaccurate in two ways: he may see Other as more similar to himself, or as more dissimilar, than is actually the case. We find that when Subject communicates with an Other who disagrees with him and lacks confidence in him, he perceives greater similarity than if there had been no communication at all. This suggests that Other tends to conceal disagreement by expressing an opinion which seems to agree with Subject's. Under these circumstances, communication has the effect of leaving Subject with a mistaken impression as to Other's real opinion.

FIGURE 2-6

How Communication with Other is Related to
Subject's Accuracy in Perceiving Other's Opinion

When Other's confidence in Subject is high ————— When Other's confidence in Subject is low - - - - -



D. Summary of Findings

The study reported in this chapter was concerned with identifying a set of factors -- namely, the attitudes of two people toward each other -- which may influence the effectiveness of communication in producing (1) greater agreement about the likely impact of the Clinical Center on basic research, and (2) greater accuracy in perceiving the other person's opinion about this issue. The data concern communication as a two-way exchange of opinion, rather than one-way transmission of information.

As regards actual agreement, we find that there is greater similarity between the opinions of people who have communicated about the Clinical Center than between the opinions of those who have not. Further, communication is more effective in producing agreement between people whose liking for each other is mutually strong than between people who report only mutually mild liking.

In analyzing data on accuracy of perception, we make a distinction between the Subject whose accuracy is being measured, and the Other whose opinions are perceived. It appears that communication is associated with an increase in Subject's accuracy under any of the following conditions:

- (1) when Subject's liking for Other is mild, or
- (2) when Other's confidence in Subject is high, or
- (3) when Subject and other agree or disagree only slightly.

On the other hand, communication is not associated with increased accuracy when Subject and Other disagree and when either of the following conditions is also present:

- (4) when Subject's liking for Other is strong, or
- (5) when Other's confidence in Subject is low (less than complete confidence).

A major point emerging from these findings is that lack of confidence can be a serious bar to effective communication, especially if the two persons hold divergent views.

Although the data are not included in this report, the final step in the research was to examine the relationship between communication and accuracy, controlling simultaneously on Subject's liking for Other and Other's confidence in Subject. As would be expected, the effects of mutually opposing conditions tend to cancel each other out, whereas the effects of mutually supporting conditions tend to reinforce each other. For example, when conditions (1)

and (2) are combined, communication is associated with a marked increase in accuracy. Similarly, when conditions (4) and (5) are combined, there is actually a decrease in accuracy as a result of communication. But when conditions (2) and (4) are combined, the two opposing trends cancel out, and the relationship between communication and accuracy disappears. */

Note that the findings contain an interesting paradox. Strong liking has two effects which, at first, seem inconsistent: under strong liking, communication is associated with (a) closer actual agreement, but also with (b) no increase in accuracy of perceiving disagreement. The problem is, how can communication lead to closer agreement if neither person knows exactly what the other person thinks? One answer is along these lines. Numerous experiments have shown that people can respond to events which they do not consciously perceive. Thus an individual may be persuaded to change his mind about an issue, although he is not entirely aware that the other person disagrees with him, or even that a change is taking place in his own opinions.

Conclusions and implications

The present study was designed primarily to clarify one area of social psychological theory. However, the findings seem to have implications for administrative problems and procedures as well. These implications are based on the assumption that any organization will operate better, that it will function more smoothly, if people can agree about what the organization is trying to accomplish, and about the most effective means of attaining its goals. It also seems likely that cooperation will be less effective if people have mistaken impressions about each other's views. Thus it is important from a practical point of view to determine how closer agreement can be achieved and mistaken impressions reduced.

We may consider the Clinical Center issue as an example. **/

*/ It is wise to remember that these data refer to an issue where opinions are relatively "free to vary". There is no compulsion to arrive at a common decision about the long-range effects of the Clinical Center. However, where a concrete decision must be made -- for example, on a policy regarding program or expenditures -- these findings may not hold. Lack of confidence may not reduce accuracy if a crucial policy is at stake; people may be willing to voice their real opinions. Research on this hypothesis would be valuable.

**/ The reader is referred to pages 232 through 251 of the General Report on the First Year's Findings in which this issue is discussed at some length.

Prior to the opening of the Center there was considerable apprehension about the new program on the part of some of the intramural scientists. Let us assume, for the sake of illustration and in the absence of current information, that working relations between the basic and clinical research programs have been characterized to some extent by disagreement on goals, lack of mutual confidence, and other difficulties. Under these circumstances, a problem of the utmost importance would be to determine how to encourage more fruitful collaboration between the two groups. The data from our analysis suggest the following points.

1. Face-to-face discussions, the two-way exchange of opinions, seem to be helpful in promoting agreement (even if they do not necessarily produce more accurate understanding). Such discussions should be therefore encouraged, as a supplement to formal channels for one-way transmission of information.
2. At the same time, it is clear that such discussions will be limited in their effectiveness by the attitudes of the basic and clinical scientists toward each other. If unfavorable attitudes exist, it would seem wise, at the beginning, to spend little time discussing specific issues on which there is sharp disagreement. Instead, time should be devoted to overcoming emotional road blocks -- possibly by stressing the areas on which there is agreement. Communication aimed at establishing good working relations may have to precede communication about specific issues.

For example, the intramural scientists expressed concern over the amount of influence clinicians would be likely to have in determining scientific policies. This could become a real source of interpersonal frictions, and an obstacle to effective communication. Attention should be devoted to making sure that the procedures for such decisions have been worked out to the satisfaction of all concerned. Well-meaning attempts to relieve others of administrative burdens can easily be interpreted as personal aggrandizement.

In closing, it may be well to point out that as yet we know relatively little about the conditions which influence the attitudes of people toward each other. The studies reported in the first two chapters agree in finding that such attitudes play a significant part in organizational effectiveness. Under what conditions do these attitudes arise, persist, or change? Is lack of confidence more likely to prevail among persons of unequal status or among colleagues? Do different patterns of professional leadership have an effect on the attitudes of scientists toward each other? We hope to explore these hypotheses in future analyses.

CHAPTER III

ROLE OF THE INSTITUTE ADMINISTRATIVE OFFICE IN SCIENTISTS' SATISFACTION WITH AUXILIARY SERVICES

Donald C. Pelz

A. Introduction

Aims of this analysis

Since 1948, the overall pattern of organization of the National Institutes of Health has changed markedly. A major change was the reorganization of existing laboratories into institutes and the creation of new institutes, each provided with its own administrative office responsible to the institute director. */

The largest single division is, of course, the central administration, responsible to the NIH Director. It carries on most of the "housekeeping" functions for the entire organization, including accounting, personnel, maintenance, and a variety of specialized services needed for scientific work. Over the past several years many such functions have been transferred from the laboratories or institutes and consolidated in the central administration. One objective of the NIH study was to find out strong and weak spots in this system, as seen by the scientists. The General Report showed that most services are in fact viewed favorably. **/

The present analysis takes up a different question: is there anything in the way services are obtained which may help or hinder their effectiveness? Where should certain services be located -- centrally or in the institutes -- to render maximum satisfaction? For central services, what methods of obtaining them work best? What part does each institute administrative

*/ In two institutes -- NCI and NHI -- there is also a branch of the administrative office reporting to the institute's scientific director.

**/ Human Relations in a Research Organization, 1953, Vol. II, pp. 192-202. Only in three areas (job classification, recruitment and hiring, and requisitioning of supplies and equipment from outside) does satisfaction drop near the 60 percent mark.

office play in obtaining them, and what part should it play?

In this analysis we shall focus on data from the intramural professionals, the laboratory scientists.

Functions of the institute administrative office

First, it will be helpful to review some relevant features of the NIH setting.

In any large organization it is convenient to distinguish between two sets of people: the "line" and the "staff." At NIH the institute "line" refers to the director, scientific director, laboratory and section chiefs, and investigators; the "staff" refers mainly to the administrative office. Almost all of the central administration functions as "staff" to the NIH Director.

In theory, the job of the "staff" is simply to assist the "line." But in assisting the chief of the line, the staff personnel often serve two different functions for the rest of the line. They may provide assistance in its real sense, or they may exercise control and regulation.

In the central Office of the Director, for example, the job classification service executes an important control function -- that of keeping the grade structure at NIH internally consistent, and consistent with the grade structure of all Federal employees covered by Civil Service.

Within each institute, likewise, the staff group provides control as well as assistance. In all institutes, requests for personnel actions -- hiring, firing, promotion, or job reclassification -- must first be cleared through the administrative office, to see that they accord with institute policy and budget. They must also be approved by the central personnel office.

In addition to personnel actions, the institute obtains goods and services from several central groups such as stock room, purchasing, animal colony, scientific instrument shop, carpentry and electrical shops, photography, translating, etc. To what extent is control necessary in these areas?

Charges for each service are made against the institute budget on a simplified basis. The institute contributes a yearly sum, which is adjusted periodically in the light of actual or anticipated use. Only large or unusual orders are paid for as they arise. Under this system the institute knows in advance how much it is spending for routine orders. There is corresponding-

ly less need to check them against current funds. */

It is interesting, then, to note that the institutes differ widely on the channels for service requests. In some cases a person in the administrative office must sign (formally approve) an order; in other cases the office merely transmits or executes it; and in other cases the office does not even do this.

Correspondingly there is wide variation in the authority given to scientists. In some cases a senior investigator or section chief in the research program is authorized to sign for nearly all routine orders, and the order is sent directly to the central group. To the best of our knowledge, NIAMD and NMI fit this pattern. In other institutes the order must be signed by a lab chief or someone designated by him, and is then transmitted via the administrative office (as in NHI). **/ And in other cases the order must be signed by someone in the administrative office (as in NCI and some of the smaller institutes). This diversity is typical of the institute autonomy at NIH.

Procedures for special purchases -- requisitions from outside sources -- are generally tighter, but again there is variation. In some institutes a request under \$100 can be approved by a lab chief (as in NIAMD and NMI); it then may be transmitted by the administrative office. Larger orders may require clearance with the administrative office. In other institutes all requisitions must be approved by the scientific director or an administrative officer or assistant (NHI, NCI, and some of the smaller institutes).

What effects do these procedures have on the adequacy of services? We know that needless delays may result. For example: a scientist may call the stock room or a shop, find that the service can do what he needs by the time he needs it, and then put through a formal order. Days later he calls to find out why the job isn't

*/ Approval of large or unusual expenditures is still necessary of course; and a general review is needed to stabilize the yearly contributions. In the case of a scarce resource, such as time of the instrument shop, approval may be needed to make sure all laboratories get a fair share.

This description applies to the system as it operated when the survey was made in 1952.

**/ We shall use the term "administrative office" to include the staff attached either to the institute director or the scientific director.

done, discovers that the order has not yet arrived. In interviews some scientists remarked that they must get approval of the administrative office for "every bottle stopper and test tube." At what point does administrative control become more of a nuisance than a necessity?

For some relevant survey data we turn now to the findings. They will be presented in four sections, showing how scientists' satisfaction with auxiliary services varies according to (1) the location of the service (whether central or intra-institute), (2) institute where scientist is working, (3) methods used for obtaining services, and (4) interpersonal relations between scientists and the administrative office.

B. Findings with Respect to Location of Services

The measure of location

On the questionnaire, for each of the fourteen auxiliary services scientists were asked (Question 44):

" . . . please indicate whether your own experience with each service listed has been mainly with personnel in the Central Administration or with personnel in your own Institute, or equally with both (or perhaps you have had no experience with either)."

This item was designed as a possible way of answering the question: where should services be located -- centrally or in the institutes -- to render maximum satisfaction?

The meaning of "experience with personnel" is somewhat ambiguous. It might refer either to (1) the people who actually perform the service, or (2) the intermediaries who transmit the request, such as the scientist's assistant, chief, or administrative office; or it might refer to both.

The data themselves support the first meaning (the one originally intended). Each institute is fairly uniform in its procedures for transmitting different types of requests; the data, in contrast, show wide variation in the personnel who are contacted for different services. Furthermore, on five services (library, maintenance and repair, shop work such as carpentry, photography, and translating) from 61% to 89% of scientists say their main experience has been with central personnel, while only 17% to 44% say their main experience has been with institute personnel or

with both. Very clearly, these services are all performed in the central administration. Although orders to them are often transmitted through institute channels, this fact is not reflected in the data.

We shall assume then that location of personnel contacted largely means "location of the service itself."

Location of services and satisfaction with their results

There are seven services which permit a test of the question, in that central and institute experience are both reported by 15% or more of the scientists. On three of these, persons reporting "institute" experience are significantly more satisfied with the service than those reporting "central" experience (see Table 3-1). These are: requisitioning outside supplies, scientific instruments and glass-blowing, and recruitment of non-professional personnel. */

Thus certain services, especially requisitioning of outside supplies, appear more effective if handled by institute rather than by central personnel. If institute facilities were used for more of the special purchasing, satisfaction might rise considerably.

Further analysis of the data on scientific instruments showed that differences are largely contributed by one institute: NCI. At the time of the survey (October 1952) this organization had its own technical shop. Correspondingly, NCI personnel constitute 72% of those who are reporting on institute facilities but only 3% of those reporting on central facilities. And in NCI, 98% express satisfaction with their own shop!

Other data show clearly that a local instrument shop gives faster service. Of those scientists who report satisfaction with central facilities, only one-quarter name speed as a reason, while among those satisfied with institute facilities, one-half give speed as a reason (the exact figures are 23% and 49% respectively; difference statistically significant).

Subsequently the NCI shop was integrated with the central instrument shop. There were several reasons for the move, including a need for more facilities for the new Clinical Center. Whatever the reasons, the consolidation will undoubtedly reduce efficiency of service for NCI. Ways of reducing the time lag may require attention.

*/ The other four tested (showing non-significant differences) are: job classification, laboratory animals, supplies from store room, and payroll and travel vouchers.

TABLE 3-1

Satisfaction with Central
and Institute Auxiliary Services

	<u>Location of service</u>		
	<u>Central</u>	<u>Institute</u>	<u>Diff.</u>
Requisitioning of supplies and equipment from outside			
Generally adequate	52%	76	24 **
Often inadequate	$\frac{48}{100\%}$	$\frac{24}{100}$	
N giving opinion =	66	134	
Recruitment and hiring (espec. non-professional)			
Generally adequate	44%	63	19 *
Often inadequate	$\frac{54}{100\%}$	$\frac{37}{100}$	
N giving opinion =	61	67	
Scientific instruments and glass-blowing			
Generally adequate	75%	91	16 *
Often inadequate	$\frac{25}{100\%}$	$\frac{9}{100}$	
N giving opinion =	145	55	

* A single asterisk in these tables indicates that the difference is statistically significant; there is a probability of less than 1 in 20 that a difference of this size could have arisen purely by chance. (The difference is "significant at the .05 level of confidence.")

** A double asterisk indicates that this difference is highly significant; the probability of its being due to chance alone is less than 1 in 100 ("statistically significant at the .01 level of confidence").

C. Findings with Respect to Institute

We have seen that the institutes vary widely in the role of the administrative office in obtaining services. What is the effect of these variations?

A careful analysis was done of scientist's attitudes in each institute. Our conclusion is that with the one exception of job classification there are no substantial differences between the institutes, in satisfaction with services. */ Fluctuations do appear, of course; each institute has its ups and downs. But with the exceptions just noted there are no overall trends.

The data on job classification service are shown in Table 3-2. Two points may be noted. (1) Almost all NCI scientists who report any experience with job classification name the central office rather than institute staff as the point of contact. In other institutes there is a half-and-half division. (2) The differences in satisfaction are confined to contact with the central office (upper half of table). Here only one-third of NCI scientists are satisfied with the results, compared to over half in the other large institutes and over three-quarters in the smaller -- a range of 40 percentage points.

It is probable that NCI needs more assistance on job classification, and that more negotiation within the institute may be helpful. There already exists a mechanism which might accomplish these ends. Several years ago the central personnel office replaced a system of "specialists" with one of "generalists." Each generalist handles all the personnel negotiations for a few institutes. An institute can thus address its problems to a single person, who becomes well acquainted with the members and their needs. Perhaps the NCI generalist should be "loaned" to NCI, assigned a spot within the institute, where he would be directly accessible to its members.

*/ In making this analysis we took into consideration the location of the service (whether reported as central or local) and the grade of the respondent. We suspected, for example, that the older scientists in NCI might resent the administrative office channel more than the younger. No evidence of this appears; at all grades NCI scientists are no different from those in other institutes. In grades GS-13 and up some of the institute differences are greater than in the lower grades, but these differences do not relate meaningfully to variations in procedure.

TABLE 3-2
Satisfaction with Job Classification
Service, by Institute

	<u>NHI, NIMH and NIDR combined</u>	<u>NMI</u>	<u>NIAMD</u>	<u>NCI</u> ^{a/}
When experience is mainly with <u>central</u> personnel, job classi- fication is:				
Generally adequate	77%	57	58	37
Often inadequate	$\frac{23}{100\%}$	$\frac{43}{100}$	$\frac{42}{100}$	$\frac{63}{100}$
N giving opinion =	13	21	24	43
When experience is mainly with <u>institute</u> personnel or <u>both</u> , job classification is:				
Generally adequate	58%	61	75	63
Often inadequate	$\frac{42}{100\%}$	$\frac{39}{100}$	$\frac{25}{100}$	$\frac{37}{100}$
N giving opinion =	12	18	24	8

^{a/} By the use of a chi-square test, differences among the four groups in the upper half (central contact) are almost statistically significant at the .05 level.

D. Findings on Methods Reported
for Obtaining Services

Reports of direct or indirect
contact with services

On the questionnaire professionals were asked (Question 45):

"In general, how do you go about obtaining auxiliary services of the kinds listed above . . . from the Central Administration? . . ."

They were asked to select the most important and next most important method from five alternatives, including two channels for direct contact with the service (by personal or phone conversation, or by memo) and three indirect channels (via the chief, personal contact with the administrative office, or memo to the administrative office).

Reports on use of various methods are shown in Table 3-3. They are rather surprising in view of the substantial role which we know the administrative office plays. On "first choice" over four-fifths of the scientists report that they deal directly with the central groups; only 14% report use of the administrative office. And even when first and second choices are combined, the number utilizing the office is less than one-third.

Discussion of these results with NIH personnel suggested a plausible interpretation. A scientist will first call up the service and settle the details verbally; then he will submit the formal request "through channels." */

Whatever the official procedures, the results suggest that the informal or actual methods bring the scientist into much direct contact with services. And in view of the prevailing satisfaction, this freedom for informal direct contact appears to work well.

*/ Some of the newer scientists, also, may be unaware that the memo they address to the service must clear through the administrative office. This view is supported by the fact that those in beginning grades report much less use of the office (14% in GS-11 and below, compared with 45% in GS-13 and above).

TABLE 3-3
Methods Reported in Obtaining
Central Services

	<u>First Choice</u>		<u>Second Choice</u>	
<u>Direct Contact</u>				
Contact services personally	37%	} 82%	29	} 53
Send memo or requisition	45		24	
<u>Indirect Contact</u>				
Tell chief	4		5	
Contact institute administra- tive office personally	7	} 14	9	} 16
Send memo or requisition to institute administrative office	7		7	
No second choice	<u>- -</u>		<u>26</u>	
	100%		100%	
N giving at least one method =	282		282	

Variations in methods
across institutes

One is immediately curious as to how closely the reported methods correspond to the official methods. Some relevant data are shown in Table 3-4. For this and all subsequent analyses we have made use of both first and second choice as to method; the purpose was to increase the number reporting any use of the administrative office, on which our attention is to be focussed. */

*/ Thus if a scientist's first choice is a direct method and his second choice is via the administrative office, he is assigned to the latter category.

TABLE 3-4

Methods to Obtain Central Services,
by Institute
(in order of increasing size)

<u>Method</u> ^{a/}	<u>NHI, NIMH, and NIDR</u>	<u>NMI</u>	<u>NIAMD</u>	<u>NCI</u>
Direct contact				
Personal	31%	30	27	23
Memo	22	36	40	46
Indirect contact				
Chief	2	8	13	6
Admin. off. - pers'l	41	12	10	7
" " - memo	4	14	10	19
	100%	100	100	100
		26	20	26
N giving method =	49	59	98	72
Size: ^{b/}				
Intramural professionals	61	76	107	85
All employees	249	215	247	355

^{a/} First and second choices combined.

^{b/} Number of employees at Bethesda who returned questionnaires, representing about 94% of full-time staff (excluding visiting scientists, fellows, etc.).

Again the results are surprising. We saw in the introduction a distinct contrast between the two largest groups, NCI and NIAMD, in extent of channeling through the administrative office. Yet in Table 3-4 there are clear trends associated simply with total size of the organization. As we go from smaller to larger institutes, there is a steady decrease in personal contacts: a small drop in direct contact and a marked drop in contact with the administrative office. Conversely, with increasing size there is a steady increase in memos: a marked rise in direct memos to the service and a slighter rise in those to the administrative office.

Previous studies have shown that larger organizations tend to be less "personalized" and more "routinized" in their functioning. The same trend appears in these data for NIH, and stands as a reminder of the price of bigness.

One other point: we see that as the institutes increase in size, the total use of the administrative office declines. To some extent this trend reflects official policy. NHI and other small institutes make the administrative office an official channel; and reported use is 45%. In NMI and NIAMD by-passing of the office is official; and reported use drops to 26% or lower. But in NCI, where orders must channel through the administrative office, the reported use of it is no higher. Have scientists found this machinery more cumbersome than useful? Are they avoiding it?

The writer was inclined to this view, until he analyzed the data by grade of scientists, obtaining the results shown in Table 3-5. Note that for persons in GS-13 and above (including corresponding Corps ranks), one-half of the scientists in NCI do utilize the administrative office. Furthermore this institute shows the largest increase in use from lower to higher grades. Its members, as they rise in rank, appear to be adapting to the official channels. Discrepancy between policy and practice is confined to the younger members. */

*/ The reader will recall from the previous section that this discrepancy at lower grades does not seem to be a handicap. The junior-level scientists in NCI report the same satisfaction with services as do their peers elsewhere.

In both NCI and NIAMD there is a significant increase in use of administrative office with rise in grade. In NCI this increase is compensated mainly by a decrease in direct personal contact, and in NIAMD mainly by decrease in reliance on chief. The meaning of this contrast is not clear.

TABLE 3-5

Methods to Obtain Central Services,
by Institute and Grade ^{a/}

Method	NHI, NIMH, and NIDR			NMI		
	GS-11 & below	GS-13 & up	Diff- erence	GS-11 & below	GS-13 & up	Diff- erence
Personal	38%	29	-9	42	19	-23
Memo	29	7	-22	29	29	0
Chief	4	0	-4	8	14	6
Admin. off.	<u>29</u> 100%	<u>64</u> 100	35	<u>21</u> 100	<u>38</u> 100	17
N =	24	14		24	21	

Method	NIAMD			NCI		
	GS-11 & below	GS-13 & up	Diff- erence	GS-11 & below	GS-13 & up	Diff- erence
Personal	26%	23	-3	37	5	-32 *
Memo	48	35	-13	50	41	-9
Chief	21	3	-18 *	3	4	1
Admin. off.	<u>5</u> 100%	<u>39</u> 100	34 **	<u>10</u> 100	<u>50</u> 100	40 **
N =	42	31		30	22	

^{a/} Including Commissioned Corps equivalents.

* Statistically significant (.05 level).

** Highly significant (.01 level).

Relationships between methods used
and satisfaction with services

The next step is to ask which of these reported methods will promote the greatest satisfaction. Six services were selected for study, on the basis of their showing sufficient dissatisfaction to permit discrimination among the methods. */

When we examine these items we find that on five of them there is almost no relationship between the method used and satisfaction with the service (data not shown for these five areas). Both scientists who regard the service as "generally adequate" and those who report it as "often inadequate" show almost identical use of the five methods. **/

This lack of relationship was at first surprising and disappointing. Numerous steps were taken to see if some hidden pattern could be brought to light. Were the results different in institutes of different size? Were they different depending on the presence or absence of strains between scientists and administrative personnel? All paths led to the same negative answer.

Upon second thought the results appeared more plausible. They reinforce a tentative picture that has emerged so far. Regardless of the formal channels, scientists at NIH seem to have considerable leeway for whatever informal methods they wish. If this inference is correct, then no one of the informal methods will appear markedly superior; each will be used by those who feel it gets the best results. The entire system is flexible, with alternative channels; and it seems to operate well. Among informal procedures there is no one "best method."

The exception lies again in the area of job classification. Of all the services, this is the one where the control function of the central staff is most obvious. Classification standards must be kept consistent with those in other government bureaus and among the institutes. There is little freedom as to method; all institutes must

*/ As seen in the accompanying table, percents were computed on the basis of those satisfied and dissatisfied, rather than on the basis of those using a particular method. This permits simultaneous comparison among all the methods. The six services utilized were: supplies from stockroom, requisitioning from outside, job classification, recruitment, shop work such as carpentry, and scientific instruments.

**/ As a precaution, we did a parallel analysis using those who report experience with central personnel only. The same lack of relationships was found.

TABLE 3-6

Relationship between
Methods for Auxiliary Services, and
Satisfaction with Job Classification

<u>Method</u>	<u>Job classification</u>		<u>Diff- erence</u>
	<u>Generally adequate</u>	<u>Often inadequate</u>	
Personal contact	28%	9	19 *
Memo	27	46	-19 *
Chief	3	9	-6
Admin. off. - pers'l	22	17	5
" " - memo	20	19	1
	<u>100%</u>	<u>100</u>	
N =	60	54	

* Difference significant (.05 level).

follow the same procedures, in which clearance by the institute administrative office is required. In addition to these rigidities, intangible factors and subjective judgments must be weighed; decisions must be reached on matters that touch personal feelings.

Under such conditions, it is not surprising to find the results shown in Table 3-6. Scientists who are satisfied with job classification make more use of direct personal contact; those who are dissatisfied rely more on direct memos. */

Personal contacts, then, provide a valuable supplement to the formal channels for negotiating job classifications. Personal contacts are already emphasized by the system of personnel generalists. This emphasis appears fruitful, and should be encouraged.

*/ To make sure that satisfaction with the central service is being reported, Table 3-6 omits those whose experience has been with institute personnel only. A similar relationship obtains when this check is disregarded.

One may wonder whether the result is due simply to the previous finding on NCI's dissatisfaction with job classification. There is some connection: of all institutes NCI has least personal contact and relies most on memos; and within that organization the finding in Table 3-5 disappears. But the relationship does occur within the other institutes; it stands on its own.

E. Findings on Perceptions
toward Administrative Office

The evidence so far is that the institute administrative office has remarkably little effect on the adequacy of services. At the beginning we suspected that its participation might introduce delays; no hint of this has emerged.*

The previous data, however, have concerned a quantitative factor: the amount of office participation. But what about qualitative factors in its manner of operating? When we examine such data, some sharp relationships do emerge. In this analysis we shall have to depend as before on scientists' perceptions, as obtained from the questionnaires.

Three perceptions or attitudes toward
the administrative office

One of the questionnaire items (Question 2) was:

"In your own experience, have you noticed any strains or frictions in relations between members of different groups at NIH such as the ones listed below? . . . "
Attitudes toward five pairs of groups were asked, including "Administrative Officers (and their assistants) with professional personnel."

In addition four groups of administrative personnel were described, including "The Administrative Officer in your Institute (your Institute's Executive or Administrative Officer, together with any of his immediate staff)"; respondents were asked (Questions 14 and 15):

"How familiar do you feel with the general activities and major decisions of each of these individuals or groups?"
and

"Regarding each of these individuals or groups, how competently do you feel they are performing their functions? Regardless of whether their intentions are good or poor, what kind of a job are they actually doing? . . . "

*/ The difficulties observed in the job classification area do not seem to stem from administrative delays, but rather from the drawbacks of written communication-at-a-distance in contrast with face-to-face communication.

These questions provide data on three variables: awareness of strains or frictions, reported familiarity, and perceived competence.

It should be noted that two of these variables are highly inter-related (See Table 3-7). Scientists who differ in perceived competence of their administrative office also differ sharply in awareness of strains between professionals and administrative officers.

Which is cause and which effect? Each may in fact affect the other. A scientist may bring a problem to the administrative office and find it handled ineptly, thus leading to friction. Or friction may arise from personal dislikes or from red tape, and the scientist concludes that the office is incompetent. Since this study is concerned with interpersonal relations, we shall focus on strains.

It is important to note that neither of these variables is related to the scientist's familiarity with administrative office procedures (data not shown). Sheer information does not seem to reduce interpersonal difficulties, nor improve estimates of administrative competence.

TABLE 3-7

Relationship between Perceptions of
Competence and Strain with Administrative Office

<u>Strains or frictions</u>	<u>Perceived competence</u>		
	<u>Very, fairly good job</u>	<u>Mixed or poor job</u>	<u>Diff- erence</u>
Slight or none	53%	10	43 **
Moderate	39	48	-9
Severe	8	42	-34 **
	<u>100%</u>	<u>100</u>	
N giving opinion =	179	91	

** Difference highly significant (.01 level).

Strains with administrative officers,
as related to satisfaction
with services

The major point to be made is that the quality of personal relations between the administrative office and the scientists is definitely related to the latter's satisfaction with services. This is seen most clearly in the case of strains and frictions, as shown in Table 3-8 for four key services. In every case, those reporting "severe strains" are less satisfied than are those reporting "slight or no strains." (A similar though less striking pattern is found for perceived competence; data not shown.)

TABLE 3-8

Relationships between
 Strains with Administrative Officers, and
 Satisfaction with Four Auxiliary Services

	<u>Slight or no strains</u>	<u>Moderate strains</u>	<u>Severe strains</u>	<u>Diff- erence</u> ^{a/}
<u>Supplies from storeroom</u>				
Generally adequate	83%	79%	64%	19 *
Often inadequate	$\frac{17}{100\%}$	$\frac{21}{100\%}$	$\frac{36}{100\%}$	
N giving opinion =	105	115	55	
<u>Requisitioning from outside</u>				
Adequate	73%	70%	44%	29 **
N =	109	114	55	
<u>Job classification</u>				
Adequate	69%	62%	32%	37 **
N =	65	76	38	
<u>Recruitment and hiring</u>				
Adequate	64%	61%	29%	35 **
N =	74	83	38	

^{a/} Difference shown is between the "slight" and "severe" categories.

* Statistically significant (.05 level).

** Highly significant (.01 level).

Note also that the existence of only "moderate strains" is not a handicap in this respect. Some degree of friction is inevitable, especially where the administrative staff must exercise control functions. But if these frictions can be kept within reasonable limits, the effects on services need not be feared.

Variations by institute

The next table shows that in the larger institutes it may be more difficult to keep scientist-administrator tensions within "reasonable limits." Table 3-9 shows that on both strains and perceived competence the most favorable attitudes are found in the smallest institutes and the least favorable in the largest. Overall size of organization may make good relations harder to build and maintain. */

Some additional evidence suggests that it is also more important for the larger institutes to reduce scientist-administrator tensions. Separate computations of the relationships between strains and satisfactions with services were obtained for each institute. In general, the larger the institute the stronger is the tendency for severe strains to go with dissatisfaction. In the larger organizations, disturbances seem to spread more readily from the one area to the other. **/

Deliberate efforts may be required in the larger institutes, aimed at understanding the sources of tensions and seeking ways to reduce them.

*/ One wonders whether the high proportion of "severe strains" in NCI has resulted in part from the channeling of all service orders through the administrative office. There is no satisfactory way to test this question with existing data. We examined the scientists' reports on methods used to obtain services, to find out whether those using the administrative office would be less favorable to it. No relationship was found, either for the whole population or within NCI. But in fact no relationship ought to exist, since these data are believed to reflect informal rather than official methods.

**/ NCI shows statistically significant relationships between strains and all four services; NIAMD shows two significant relationships (with requisitioning and recruitment); NMI shows one (with requisitioning); the three small institutes show none.

Regarding the nature of causal connection, it is an open question as to whether strains interfere with services, or whether poor services are blamed on the administrative office or both. The present data give no answers although they hint that both processes operate. Further "depth" research here would be rewarding.

TABLE 3-9

Perceptions of Administrative Office,
by Institute

(in order of increasing size of total staff)

	<u>NHI, NIMH and NIDR</u>	<u>NMI</u>	<u>NIAMD</u>	<u>NCI</u> ^{a/}
<u>Strains and frictions</u>				
Slight or none	58%	47	44	18
Moderate	39	36	42	45
Severe	<u>3</u>	<u>17</u>	<u>14</u>	<u>37</u>
	100%	100	100	100
N =	57	75	92	78
<u>Perceived competence</u>				
Very, fairly good job	83%	69	69	53
Mixed or poor job	<u>17</u>	<u>31</u>	<u>31</u>	<u>47</u>
	100%	100	100	100
N =	59	67	87	74
<u>Familiarity</u>				
Clear, fairly clear idea	82%	42	47	46
Little or no idea	<u>18</u>	<u>58</u>	<u>53</u>	<u>54</u>
	100%	100	100	100
N =	62	75	107	82

^{a/} Differences between NCI and the three smaller institutes combined are in every case highly significant (.01 level of confidence). But only on strains does NCI differ significantly from the other large institutes.

Familiarity as related to
satisfaction with services
and to methods used

A final word about scientists' familiarity with administrative office activities and decisions. We saw previously that this factor is not related to strain or perceived competence. Other data show that familiarity is also unrelated to satisfaction with services. Scientists who range from a "clear idea" to "no idea" about their administrative office are equally well pleased with the end results. Increasing the scientists' knowledge as such is not likely to improve their satisfaction.

The picture is similar to one found earlier on reported methods: use of the administrative office seems to have no effect on the caliber of service obtained. And it is interesting to note that familiarity is related to methods. As one might expect, a clear idea of the administrative office goes with personal use of it; an unclear idea goes with personal contact directly with the service (data not shown; differences statistically significant). We do not know, of course, what the causal link is. It is possible that greater use leads to familiarity, more often than the reverse.

Strains and competence
as related to methods

Oddly enough, neither awareness of strains nor perceived competence has any relationship to methods used! Scientists who are either favorable or unfavorable make almost exactly the same use of the administrative office (data not shown).

To close: a review and
some speculations

Most of the data in this chapter can be summarized under two distinct constellations.

In the first constellation are several emotionally-toned attitudes. Two of these are directed toward the administrative office (awareness of strains, and perceived competence). These attitudes are related to each other, and are linked in turn with expressions of satisfaction toward several central services.

In the second constellation are two emotionally neutral items of information and behavior. One of these is sheer familiarity with administrative office activities. This is linked with informal methods for obtaining central services.

Between these two constellations no relationships appear. Familiarity does not make scientists more or less favorable toward administrative office or services. Use of different methods is (with one exception) not associated with satisfaction toward services. Even more surprising, use of the administrative office does not vary with attitudes toward it.

But are these constellations actually unrelated? Both common sense and organizational theory compel doubt. It seems rather that behavior in this relatively flexible NIH setting must have adjusted in such a way as to minimize emotional tensions. (We saw a hint of this in the adaptation of senior NCI scientists to their administrative channels.) In an unobstructed hydraulic system, the fluid will distribute to equalize the surface pressure at every point. So behavior may have adjusted to equalize emotional tension in this organizational system. And information then follows, perhaps, after behavior.

In a less flexible organization than NIH, one with fewer alternatives of action, the imbalances in pressure ought to be more in evidence. The link between behavior and emotions should reveal itself more readily to the probing of the scientific method.

F. Summary and Practical Implications

The administrative office in each institute plays a substantial part in securing auxiliary services from the central administration. The office must approve and officially transmit all personnel actions such as job reclassification, although there is wide variation among institutes in official channels for obtaining other facilities. This chapter reports analyses on factors which affect scientists' satisfaction toward central services, with a focus on the role of the administrative office. Major findings are:

1. On three services (requisitioning from outside, recruitment, and scientific instrument work) scientists are more satisfied if the service is performed within their institute rather than the central administration. The results suggest that institute facilities be used where possible, especially for outside requisitioning, and that ways be explored for reducing the time lag in instrument work by the central shop.

2. Scientists in NCI are less satisfied than those in other institutes on job classification obtained from the central personnel office. The data suggest that the situation might be improved if the personnel "generalist" for NCI spend a greater amount of time within the institute, directly accessible to its members.

3. In respect to other services, no substantial differences appear among the institutes. Apparently the wide variations in official channels for securing facilities does not affect satisfaction with the results.

4. In terms of methods reported by scientists themselves, relatively little use is made of the administrative office. It appears that scientists at NIH frequently contact the services directly to arrange the details, and then send their orders through official channels. In view of the overall satisfaction, this informal system seems to work well and should be maintained and encouraged.

5. With one exception the use of different informal methods is unrelated to satisfaction. There is no one best method; under a flexible system of alternative avenues, the scientists appear to use the one which works best for them. In fact, the freedom for direct contact with the service may be the reason why differences in official channels do not affect satisfaction.

6. In the one area of job classification, direct personal contact with the central office is more effective, while reliance on memos to the office is less effective. The use of personal negotiations, already encouraged by the system of personnel generalists, should continue to be emphasized.

7. The larger the institute, the less use is made of personal contacts, and the more reliance is placed on memos. This trend toward less "personalized" and more "routinized" procedures may be inevitable in large organizations.

8. Awareness of strains between scientists and administrative officers, and perceived competence of the office, have a strong bearing on satisfaction with several services. In larger institutes the awareness of strains is more strongly connected with service dissatisfaction; furthermore the strains are greater in larger institutes, especially NCI. Special attention to the causes and reduction of such tensions may be needed.

9. Scientists' familiarity with the activities and decisions of their administrative office is not related to favorable or unfavorable attitudes toward the office or toward the service. Sheer information about administrative procedures is not likely to reduce tensions or improve effectiveness of the services.

CHAPTER IV

AN ANALYSIS OF SELECTED FACTORS IN LABORATORY MORALE

Howard Baumgartel

A. Problem and Methods

Problem

In this chapter we shall be concerned with 20 laboratory groups.^{*/} Attention will be focused on the interrelationships between a number of different measures characterizing the twenty groups. The measures were obtained from the responses of the professional personnel to the questionnaire administered in October 1952. Our interest in carrying out this analysis grew out of a desire to find answers to some of these questions:

- What is the relationship between a laboratory's contribution to health objectives and its contribution to science objectives, in the eyes of its members?
- In laboratories which have a higher than average interest in contributing to the nation's health, is the opportunity to contribute to science seen as higher, lower, or the same as the other laboratories?
- What is the relationship between a laboratory's contribution to basic science and the satisfaction with promotional opportunities expressed by its members?
- Are laboratories which report satisfactory promotional opportunities more likely to be those which are highly involved in basic science or those which are more involved in health problems?
- What kinds of job factors increase satisfaction with scientific leadership?

The answers to such questions may have both practical and theoretical importance to the problems of understanding and managing large-scale research organizations.

Finding the answers to questions like these seemed important for two major reasons. One reason stems from the "feedback program" which was carried out this past year. In this program, information about

^{*/} See Appendix B for list of these groups.

the laboratory's standing on many different questionnaire items was provided for each laboratory unit in the NIH intramural research program. During the discussion of this information, many questions arose as to the meaning of a "high" or "low" standing on some particular item. The analysis which we are reporting in this chapter provides some answers to these questions. The findings indicate whether a high or low standing on one item is associated with a high or low standing on each of several other items. A knowledge of these relationships will enable a laboratory chief and his staff to appraise more adequately the meaning of a particular percentage on a particular item.

The second reason stems from our interest in a subsequent analysis which will be carried out during Phase III of the project. Up to the present, our analysis of leadership variables has dealt primarily with the relationships between the scientist and his immediate chief. It is important now to carry forward this analysis to include the effects of different patterns of leader behavior on the morale and motivation of laboratory groups as a whole. To what extent do characteristics of the laboratory chief -- his motivations and interests, decision procedures, the way he allocates his time to research, supervision, or administration -- affect the satisfactions and motivations of the professional staff for which he is responsible? In order to carry out this analysis, it is first necessary for us to learn the way in which various attitude, opinion, and satisfaction factors "go together," to find out which of these factors form into "clusters." We may find, for example, that laboratory scores on 30 questionnaire items fall into five or six main clusters. If so, in measuring the effects of different leadership practices, we can plan to use only one item (or possibly one index based on several items) to represent each cluster -- thus considerably simplifying the analysis.*

It is important to keep in mind in studying this chapter that the emphasis is on the laboratory as a whole. Throughout we shall be calling attention to differences between groups and the way these differences are related to each other. The analysis reported in Chapters 1-3 was concerned primarily with the attitudes and other characteristics of individuals, or with relations between pairs of individuals. In this chapter we are talking about groups.

*/ This analysis will also have important theoretical implications for our understanding of the nature of "morale" in a research organization. Previous studies in other large organizations indicate that morale cannot be thought of as a unitary concept, but rather as possessing several components or dimensions.

Methods

In order to make the method of analysis as concrete and understandable as possible we shall illustrate by following through a step-by-step handling of three questionnaire items.

Professional personnel were asked (in a group of items under Question 50 on the questionnaire) to what extent their jobs provided for "contributing to the nation's health" and for "contributing to basic scientific knowledge." In another group of items (under Question 43), professionals were asked how satisfied they were with their "chances for promotion in the organization." We shall use these three items to demonstrate the pattern of the analysis.

The percentage distributions of the professional personnel included in the 20 laboratories on the three items are shown on Table 4-1. The first column represents the replies of all intramural professionals; the second and third columns present the data for "highest" and "lowest" laboratory on each of the three items.

The table shows, in the first instance, that there are more professionals who feel that their job provides opportunities for contributing to basic science than there are who feel their job contributes to the nation's health. Secondly, of the whole group, over half are satisfied ("very well" or "fairly well") with their promotional opportunities. Our interest, however, centers on the marked variation which appears in the responses of the different laboratories to these questions. In one laboratory, half of the professionals feel that their job provides to the fullest extent for contributing to the nation's health. In another, none of the professionals express the same feelings. The extent to which contributing to science is provided also varies from laboratory to laboratory; a difference of about 50% distinguishes the "high" laboratory from the "low" on this measure. Similarly, on the promotional satisfaction item, one laboratory has no dissatisfied professionals while in another, 57% are dissatisfied. The variation on these three items is typical of the variation on the other questionnaire items included in this analysis. On these and other items, the remaining 18 laboratories spread out over the whole range of opinion between the highest to the lowest laboratory.

TABLE 4-1

Opinions of Intramural Professionals
Total and "High" and "Low" Laboratories

	<u>Total</u>	<u>Highest</u> ^{*/}	<u>Lowest</u> ^{*/}
Extent job provides for contributing to nation's health:			
- To the fullest extent	21%	50	0
- To considerable extent	33	43	33
- To some or little extent	<u>46</u>	<u>7</u>	<u>67</u>
	<u>100%</u>	<u>100</u>	<u>100</u>
Extent job provides for contributing to basic scientific knowledge:			
- To the fullest extent	39%	72	21
- To considerable extent	46	14	43
- To some or little extent	<u>15</u>	<u>14</u>	<u>36</u>
	<u>100%</u>	<u>100</u>	<u>100</u>
Satisfaction with chances for promotion in the organization:			
- Very well satisfied	28%	47	14
- Fairly well satisfied	28	40	0
- Neutral or mixed feelings	24	13	29
- Dissatisfied	<u>20</u>	<u>0</u>	<u>57</u>
	<u>100%</u>	<u>100</u>	<u>100</u>

^{*/} Highest and lowest laboratories may be different on each item.

One has only to become aware of these marked differences between laboratories to start speculating about the relationships between the various measures. For example, if one sees the science and health objectives of NIH as being in conflict with each other, one would expect that laboratories which are high on the health item will generally be low on the science item. Or, assuming that the intramural scientists are more interested in the science objective, one would expect that laboratories which have a full provision for scientific work would, perhaps, be more satisfied with promotional opportunities.

In order to test such speculations, the following procedure was adopted: first, a mean score was computed for each laboratory on each question; second, the 20 laboratories were rank-ordered (1-2-3-4-5- etc.) on the basis of these mean scores; and, finally, rank order correlations (Pearson rho formula) were computed between the laboratory ranks on one item with the ranks on another. With this statistic a perfect positive relationship would be represented by a +1.00 -- meaning that the twenty laboratories would stand in exactly the same rank order on both items. A perfect inverse relationship would be represented by a -1.00, where the laboratories' rank standings on the two items would be exactly opposite.

Tests of statistical significance were applied to the many rank-order correlations resulting from these computations. Only those correlations which could be due to chance alone less than 1 time in 10 are included in the findings reported in the next section (correlations which equal or exceed $\pm .38$). We shall also distinguish these from correlations which could occur by chance less than 1 time in 20 (correlations which equal or exceed $\pm .45$). The latter we shall call "statistically significant" relationships and the former "suggestive" relationships.

To illustrate what these relationships "look like" we have shown on Table 4-2 the correlations between the three questions listed on Table 4-1. The pattern of relationship between the items was simplified by dividing the laboratories into two groups in each dimension, those in the top and bottom ten ranks.

It is apparent from this table that there is no relationship between the laboratory rankings on the provision for contributing to basic science and the provision for contributing to the nation's health. Some laboratories are high on both, some are low on both, others are high on one or the other. Apparently these two objectives are not incompatible with each other. A fairly strong positive relationship, however, does appear between the laboratory's rank on the health item and the laboratory's satisfaction with promotional opportunities. Of the laboratories which are in the top half with respect to opportunities provided for contributing

TABLE 4-2

Correlations Between Laboratory Rank Scores
on Three Items

		<u>Extent Job Provides for Contributing</u> <u>to Nation's Health</u>	
		<u>Low</u> <u>(Ranks 11-20)</u>	<u>High</u> <u>(Ranks 1-10)</u>
<u>Extent Job Provides</u> <u>for Contributing to</u> <u>Basic Science</u>	High	5	5
	Low	5	5

Correlation among 20 ranks = $-.06$.

		<u>Extent Job Provides for Contributing</u> <u>to Nation's Health</u>	
		<u>Low</u>	<u>High</u>
<u>Satisfaction with</u> <u>Promotional</u> <u>Opportunities</u>	High	2	8
	Low	8	2

Rank correlation = $+.57$ */

		<u>Extent Job Provides for Contributing</u> <u>to Basic Science</u>	
		<u>Low</u>	<u>High</u>
<u>Satisfaction with</u> <u>Promotional</u> <u>Opportunities</u>	High	6	4
	Low	4	6

Rank correlation = $-.22$

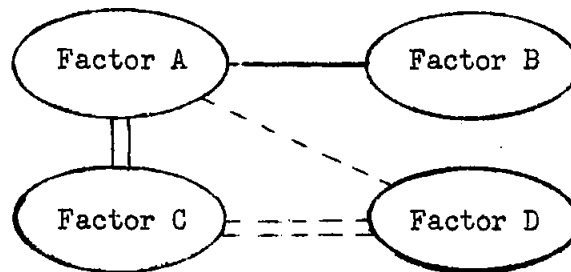
*/ Statistically significant relationship, others not significant.

to the nation's health, 8 out of 10 are in the top half on the laboratories' satisfaction with promotional opportunities.

The small, negative relationship between provision for basic science and satisfaction with promotions is not statistically significant. Relationships like this which do not attain statistical significance will be disregarded in our discussion as being too tentative to be worthy of note. The implications of the relationships between these three measures will be discussed in the next section.

One further word before reporting the rest of the findings. The rank order correlations of the laboratory scores on over 30 questionnaire items forms the basis of this portion of the report. This represents a lot of rather complicated material. We have simplified the presentation, as we have mentioned, by presenting only statistically significant relationships. In addition, we have portrayed the relationships in graphic form, as in the example below, to make it easier for the reader to grasp the main points of the analysis.

Hypothetical Example



A double solid line will stand for a significant positive correlation -- one which could have occurred by chance less than 1 time in 20. A single solid line will stand for suggestive positive correlation -- one which is probable by chance between 1 time in 10 and 1 time in 20. Broken lines indicate negative or inverse relationships, following the same scheme.

B. Findings and Interpretations

The laboratory rankings on 26 questionnaire items form the basic data for this analysis. These items cover three attitudinal areas and one independent laboratory characteristic. This material will be dealt with in the following order:

1. The importance of various factors in the job.
2. The provision of these factors.
3. Relationships between the importance and provision of the factors.
4. Satisfaction with selected aspects of the situation.
5. Relationships between provision and satisfaction.
6. Relationships between importance and satisfaction.
7. Factors related to laboratory size.

* * *

1. The Importance of Various Job Factors

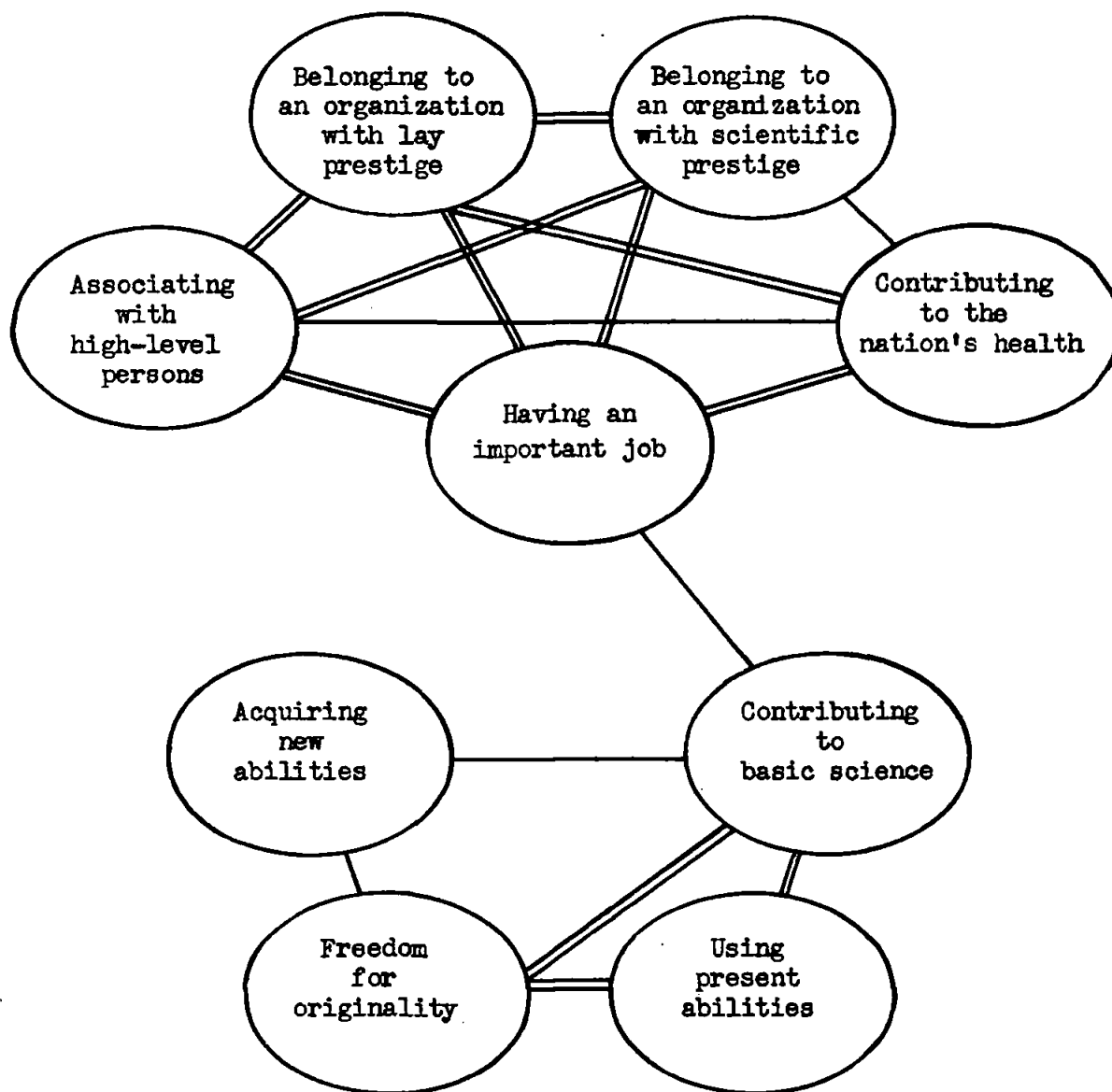
Figure 4-1 on the following page shows the interrelations among the laboratory rankings on the importance of the nine job objectives. This graphic presentation of the findings from the statistical analysis brings out the distribution of the factors into two clusters. The lower cluster indicates that laboratories which attribute a great deal of importance either to "contributing to basic science," to "using present abilities," or to "freedom for originality" also attribute more importance to each of the other two. This cluster of three laboratory measures we shall call the "science orientation"; and the rank order position of a laboratory on these measures can be thought of as the strength of this orientation. How much importance a laboratory attaches to "acquiring new abilities" seems to be a less closely related aspect of this orientation.

The upper cluster represents the high intercorrelations among the five laboratory rankings dealing with the importance attached to: "belonging to an organization with prestige in either the scientific or lay community," "contributing to the nation's health," "associating with high level persons," and "having an important job." This cluster we have termed the "health-prestige orientation." A laboratory's rank on these measures would reflect the strength of this orientation.

FIGURE 4-1

Intercorrelations Among Laboratory Rank Scores
on Importance of Job Objectives

Question: "Which of these are most important to you personally; that is,
which aspects do you most want to have in a job?"



==== Positive relationship, statistically significant.

— Positive relationship, suggestive.

Perhaps the outstanding feature of this diagram is the lack of relationship between the two orientations. Only in the case of the suggestive correlation between the laboratory ranks on "having an important job" and "contributing to basic science" is any connection apparent. The close association between a laboratory's interest in "prestige" of one sort or another and the importance it attaches to the nation's health goal is also important to note.

Before presenting some possible interpretations and implications of this pattern of relationship it is necessary to realize that correlational measures indicate nothing about the relative intensity of the two motivational orientations. Actually the science orientation is the primary motive pattern. Sixty-six percent of the scientists included in these twenty laboratories say that making a contribution to basic science is of "utmost importance" to them. Only 28% of these scientists feel that contributing to the nation's health is as important. Thus we can think of the twenty laboratories as varying from very high to high on an index measuring the strength of the science orientation and from high to low on the health-prestige index.

Interpretations

It is clear that two of the items in Figure 4-1 -- contributing to basic science and to the nation's health -- are two primary objectives of the NIH organization. It is probable that the laboratory scores on these items reflect the degree to which the various groups have committed themselves to these two organizational goals. The measures also reflect the personal goals and values of individuals in the laboratory groups. Most of the other items -- use of present abilities, belonging to a prestigious organization, and so on -- can be thought of as reflecting more personal goals and motives.

One of the basic problems of human organization is the integration and balance of personal with organizational goals. This process is a two-way street. On the one hand an organization may try to induce a high commitment to its purposes as a way of motivating its members. On the other hand it may seek to provide opportunities for its members to achieve personal goals through their working activities. Subdivisions or groups within the organization also play a part. It is well known that as people work together, exchange ideas and opinions, face problems, and develop patterns for these activities, groups become something more than aggregations. When a set of individuals share a certain objective, it becomes a group goal and gains the strength of new group forces. Numerous incidents in recent NIH history attest to the strength with which laboratories hold on to such goals.

Figure 4-1 can be thought of as a picture of the importance attached to various organizational, group, and personal goals and the way these different objectives fit in with one another. The attachment of the laboratories to the organizational goal of science appears to be well integrated with more personal motivations for making use of present abilities and having freedom. The goal of contributing to the nation's health, on the other hand, is coordinated with a different set of personal goals. Might it be desirable for both the science and the health goals to tie in with a larger number of the personal goals? For example, should contributing to the nation's health be better integrated with the goal of using present abilities? Should individuals' contributions to basic science be more integrated with building the organization's scientific prestige?

This discussion raises additional questions. What are the administrative processes by which the goals of the laboratories influence the aims of the organization, or the reverse? Are laboratory groups able to modify the overall goals?

A more basic question is this: how much concordance in goals should be sought, and at what levels? Our best hypothesis is that concordance is important mainly among those individuals and groups who must work together closely. Agreement between adjacent echelons should be useful; agreement between distant echelons may not be.

In thinking of some of these problems, it is important to note that some laboratories are high on both indices, some are high on one and low on the other, and some are low on both. Roughly five laboratories are in the lower half of the rankings on both these factors. Do these laboratories present a problem that requires attention? What goals and objectives do these groups work toward? The kind of work done by the laboratory group, the kinds of tasks assigned to these groups in the division of effort within the NIH may affect the responses of the laboratory scientists to these questions; but does the organization benefit when some groups are not strongly attached to either the science or the health objectives of the NIH?

These data also raise some question about the possibility of increasing the interest in scientific achievement by emphasizing the importance of the health objectives. Although correlational studies do not reveal the direction of causation, we might infer that emphasizing the health needs will not increase the commitment of the laboratory to the science values, and vice versa.

2. The Provision of Important Job Factors

A diagram showing the intercorrelations among the laboratories' rank scores on the nine items dealing with the extent to which the environment provides for the job factors is presented in Figure 4-2. Although the clustering is not so clear, the science and health-prestige factors are still apparent. Laboratories which rank high on the extent to which the scientists feel that the situation provides for contributing to basic science are also the laboratories where the scientists feel that there are opportunities for freedom and the use of present abilities. On the other hand, laboratories where more scientists feel that there is provision for contributing to the nation's health are the laboratories where more say that their jobs provide them with a sense of belonging to an organization with prestige in the scientific world. Also, in these laboratories more scientists feel that they have important jobs.

It is interesting to note that, in laboratories where there is felt to be more opportunity to associate with high-level persons, the members also feel that there are more opportunities for acquiring new abilities. In contrast to the importance attached to acquiring new abilities, the provision for learning new skills seems to be more closely tied in with the health-prestige group of items.

Interpretations

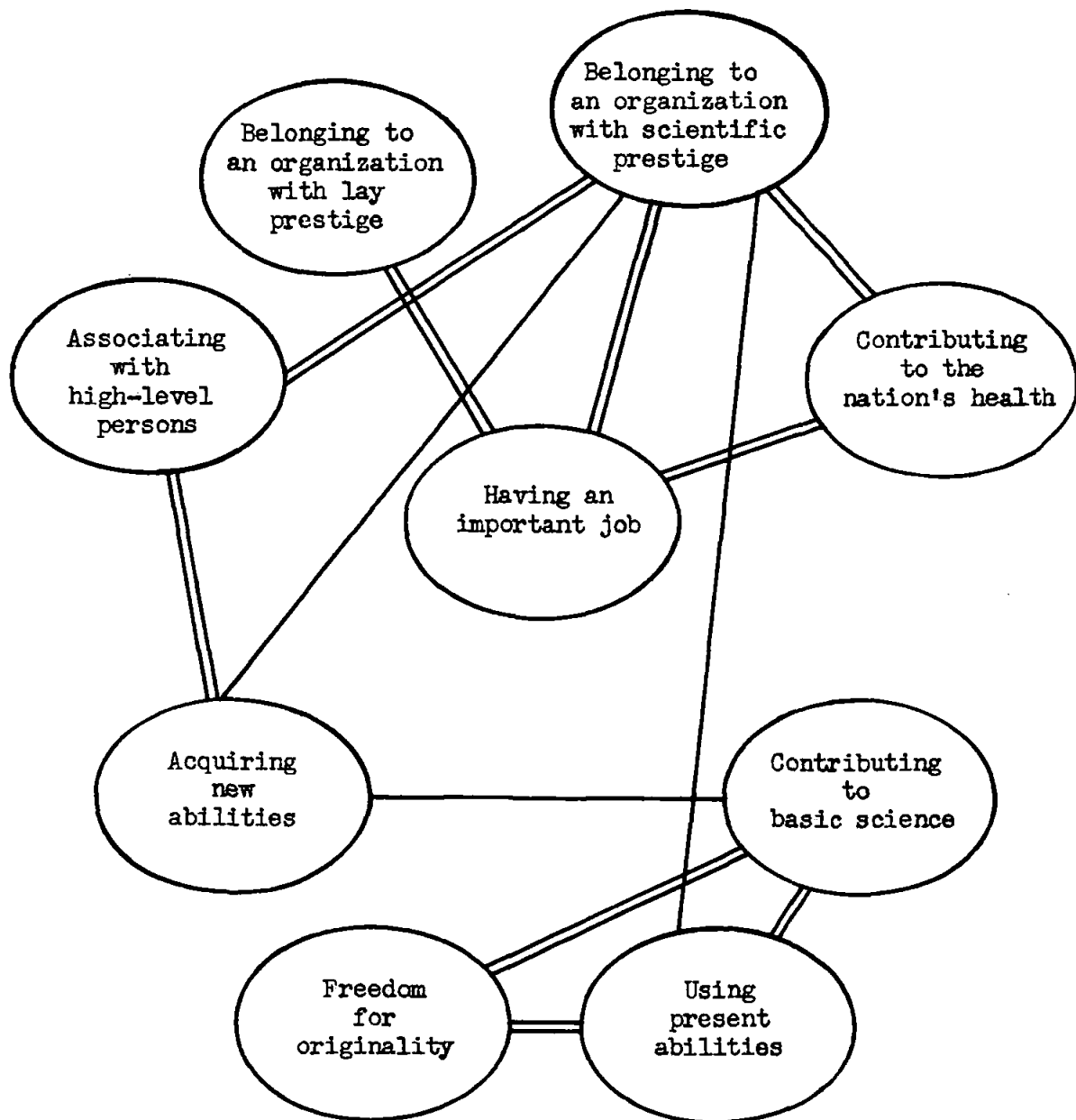
In this set of questions, the laboratory scientists were asked to make a series of judgments about their working environments. Thus we would expect the responses to reflect both the objective characteristics of the situation, i.e., whether or not there really are opportunities for freedom, and the modifying effects of certain attitudes or other psychological characteristics of the respondents. In interpreting the meaning of these and other interrelationships, it is necessary to keep in mind that the data may reflect both the actual situation and the way respondents perceive it.

Turning back to Table 4-1, we can see that, as in the case of the importance attached to contributing to basic science and the nation's health, more scientists feel that their jobs provide for scientific contribution than for health contribution. Thirty-nine percent feel that the job provides for contributing to basic science to the "fullest extent" while only 21% feel that the job provides for contributing to the nation's health to the same degree.

FIGURE 4-2

Intercorrelation Among Laboratory Scores
on Provision for Job Objectives

Question: "To what extent does your job actually provide for each of these?"



Despite these facts, there may be more frustration of motives in the science area than in the health area. Comparing the proportion of the scientists who say that each of these job objectives is of "utmost importance" (see page 10) with the proportion who indicate provision to the "fullest extent," we find that there is a much greater discrepancy between those who want basic science and those who get it than between those who want to contribute to the nation's health and get to do it -- the differences being 27% and 7%.

This lack of fulfillment in the science area draws particular attention to the two laboratory variables most closely associated with the provision for science measure. Stating the relationships in the negative way, laboratories where the scientists do not feel that they have freedom for using originality or initiative, and laboratories where scientists do not feel that their abilities are being used, are the laboratories where the fewest feel that their jobs contribute to basic science. These facts may indicate organizational problems. Are scientists in some laboratories working at tasks which do not make use of their abilities? Are there laboratories where the research programs are set in such a way that the scientists do not feel that they have participated in the decisions?

Similar questions can be raised about the provision for contributing to the nation's health. Are there laboratories which have been assigned substantial responsibilities in the health area where scientists are not given a feeling of having an important job? If "having an important job" means having some voice or influence in decision making, the participation question can again be raised.

The close association between the laboratories' ranks on associating with high level persons and acquiring new abilities suggests that the scientists interpreted "new abilities" in terms of skills in administration, program planning, public relations, liaison and fund-getting activities. These are skills which any large organization requires for its maintenance and progress; one way to develop them may be through closer contact between scientists and institute leadership.

It is of considerable interest that the data to be discussed in the next section will show that there is no relationship between the importance a laboratory group attaches to acquiring new abilities and the extent to which it is actually able to associate with the people from whom these skills can be learned!

The consistent association of the health orientation with the "prestige" orientation in both importance and provision may reflect several conditions. PHS career opportunities may be best

for those in laboratories most closely related to health problems; future administrative positions may tend to be filled from groups doing health-related work. Conversely, individuals with aspirations toward top-level positions may tend to enter the laboratories which attach more importance to the health objectives, while individuals most interested in science may avoid such laboratories.

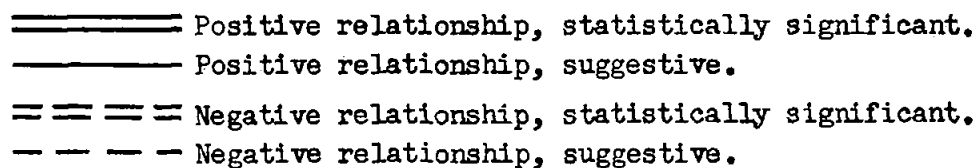
Although there is no indication of a negative relationship between "science" and "prestige", the matter of motivating and rewarding scientific achievement seems to pose the greater problem, if this pattern of recruiting top leadership is true.

3. Relationships Between Importance and Provision of Job Factors

The relationships between the importance attached to the job objectives by the various laboratories and the extent to which the environment is seen as providing for these objectives are shown in Figure 4-3. The most striking thing about this summary of the correlations is the close congruence between importance and provision in the health-prestige area, in contrast to the slight coincidence in the science orientation. Those laboratories which attach great importance to the science pattern are only slightly more likely than other laboratories to report opportunities for fulfillment. On the other hand, laboratories in which more of the scientists feel that contributing to the nation's health is important, are also the laboratories where it is felt that the environment provides more adequately for such activity.

Two negative relationships appear in this figure. Laboratories where the scientists feel that there is little freedom for originality and initiative are laboratories where more of the scientists attribute importance to associating with high-level persons and belonging to an organization with prestige in the lay community.

Correlation Between Importance of Job Objectives and Provision for these Objectives



Interpretations

The simple sense of these findings is that opportunities in the health-prestige area are distributed to laboratories in proportion to their needs for these factors, while the same is not true with respect to aspiration in the science area. Several reasons may underlie this situation. It may be, for example, that in the case of the health-prestige group, the more a laboratory is assigned tasks dealing directly with health problems, the more importance it will attach to this function; interest grows with experience. Possibly the leaders in health-oriented laboratories are more skillful in making these objectives important to the scientists. Or it may be that young scientists with greater interest in health problems or in administrative careers are more likely to enter laboratories which provide a health orientation.

The lack of relationship between the strength of motivation and provision in the science area may be due to a number of other factors. It has already been pointed out that the absolute strength of the science orientation is greater than that of the health-prestige orientation. It has also been suggested that the scientists' responses to these questions reflect a perception of the reality situation as modified by motives and attitudes. Thus we might expect that in areas of high motivation, groups with very high aspirations would feel that a certain objective opportunity provides less perceived opportunity than do groups with less high aspirations. Another factor which would have the same effect involves the concept of "reference groups" -- external groups with which the scientists identify or compare themselves. The reasoning runs as follows: health-oriented laboratories may feel that -- as compared with other groups in the public health field -- they are able to achieve their goal relatively well; while science-oriented laboratories may compare themselves less favorably with other research groups in making basic scientific contributions.

The negative relationship between the importance of associating with high-level people and the provision for freedom suggests several interpretations. It may be that in laboratories where there is felt to be little freedom (resulting from type of task, leadership pattern, etc.), the scientists come to put more stress on high-level contacts as a substitute for lost freedom. If associating with high-level people is thought of as either a method of gaining recognition (sense of worth) or the power to control the situation, this interpretation seems to make sense. In other words, it may be that the laboratories which do not have much freedom -- and hence lack a sense of worth and the ability to control their environments -- will tend to become more oriented toward obtaining recognition and influence through other means.

Such reasoning is always open to question, but it does suggest the possibility of providing more opportunities for freedom in the laboratories which are closely involved with public health problems.

In concluding this section, it is important to emphasize that the data in Figure 4-1, 2, and 3 are essentially the pattern of relationship among a number of resultants or consequences of policy decisions, leadership practices, selection and placement procedures, task assignments, etc., during the period prior to the survey. In this sense, these measures and their interrelations do not define causes and cures for problems but rather, like many clinical tests and measurements, they identify problems and suggest diagnoses.

4. Satisfaction with Selected Aspects of the Situation

The twenty laboratories were rank-ordered on seven satisfaction items. The intercorrelations among these items are shown diagrammatically in Figure 4-4. Three of these satisfaction variables -- satisfaction with the caliber of professional personnel, satisfaction with the quality of professional leadership, and satisfaction with security -- are all directly related to each other. Laboratories which rank high on one of these three items also rank high on the other two. This set of three items we shall call the "core satisfaction" cluster.

Laboratories which are most satisfied with the quality of their leadership are also most satisfied with their salaries. Laboratories which are most satisfied with the caliber of professional personnel are also most satisfied with their chances for promotion in the organization. However, laboratories where there is the least satisfaction with assisting and supporting personnel are the laboratories which are most satisfied with the reputation of NIH in the scientific world. Satisfaction with associates, leaders, salary, promotions, and security appear to have little to do with attitude toward the organization's scientific reputation.

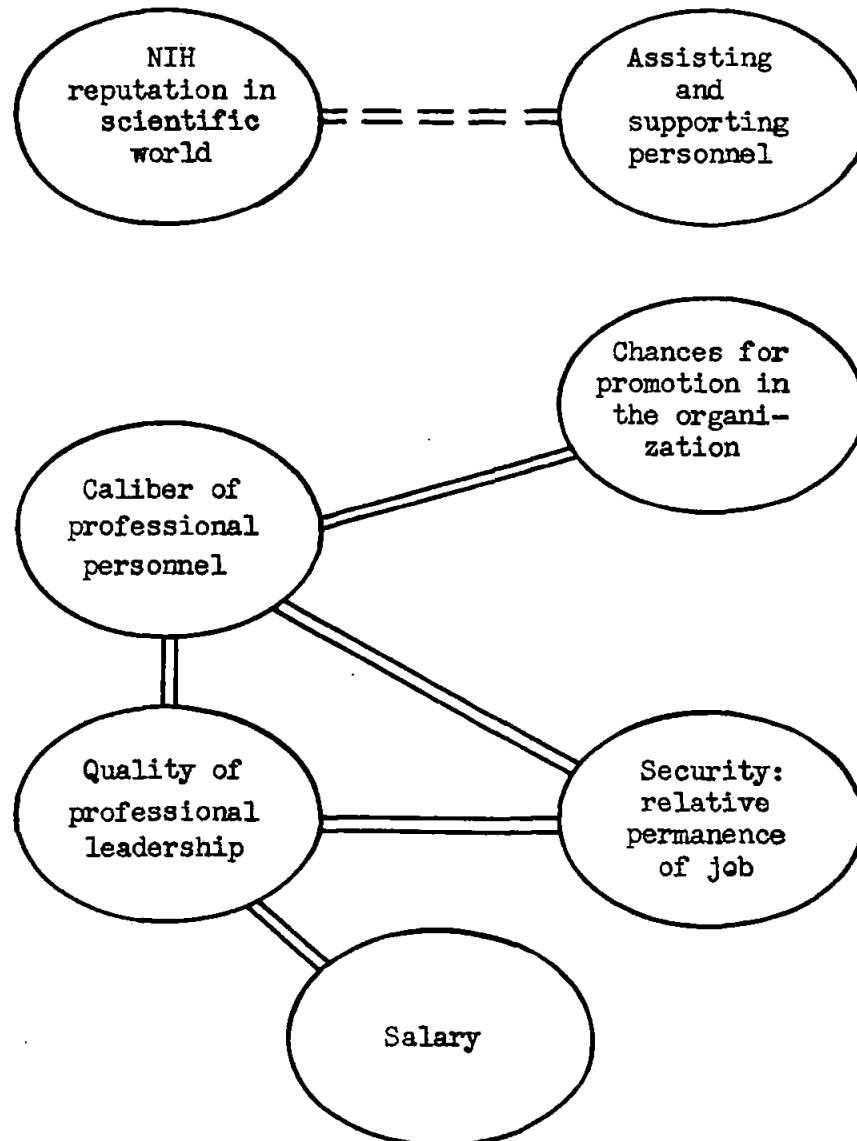
Interpretations

Before discussing the specific relationships, it is necessary to suggest the general meaning of satisfaction questions. Satisfaction is thought to represent a relation between a need or motive and the amount of gratification provided by the environment. Thus high satisfaction can result if the level of gratification keeps pace with the strength of motivation, whatever this may be.

FIGURE 4-4

Intercorrelations Among Laboratory Ranks
on Seven Satisfaction Items

Question: "In your personal experience, how satisfied are you with the following conditions as they affect you personally?"



Conversely low satisfaction can result either if motivation is relatively high or if gratification from the environment is relatively low. It is important to determine which of these two conditions exists before low satisfaction can be interpreted. Group satisfaction measures need to be interpreted in relation to the group's motivation toward various goals. However, very strong dissatisfaction may indicate potential sources of tension and conflict regardless of its source.

One other general comment stems from the traditional use of a set of satisfaction questions as a measure of "morale." Actually empirical research has indicated that there is rarely one overall satisfaction factor. Rather, research findings have consistently indicated that several different satisfaction components or dimensions are present in most group comparisons.

It is interesting to note that the three questions dealing with economic return -- salary, promotions, and security -- are not related to each other. This confirms the existence of several satisfaction components in the NIH data, and emphasizes the need for dealing with specific problems in particular laboratories. Thus a particular group may be satisfied with the present salary level but be dissatisfied with promotional opportunities. Are there difficulties faced by this laboratory which can be corrected? Have people been given an adequate understanding of the promotional system?

It is encouraging to note the positive relationship between satisfaction with the caliber of professional personnel and satisfaction with promotional opportunities. If we think of the group's satisfaction with professional personnel as an indicator of the latter's scientific achievement, this relationship suggests that merit is recognized by the promotional system.

The one negative correlation -- that between satisfaction with the reputation of NIH in the scientific world and satisfaction with assisting and supporting personnel -- probably results from very high motivation. As we shall see in the next two sections, satisfaction with NIH reputation is closely connected with importance attached to belonging to an organization with scientific prestige. Thus, the dissatisfaction with assisting and supporting personnel may result mainly from especially high motivation in certain laboratories toward scientific prestige.

The close tie-in between security and satisfaction with professional personnel and leadership suggests a condition of confidence and certainty in certain laboratories. While recognizing that complacency may deter a laboratory from making optimum scientific achievement, one wonders how laboratories without this confidence and certainty can be very effective in the research process.

5. Relationship Between Provision for Job Factors and Satisfaction

We would expect that the laboratories where provision for job factors is most adequate would be the laboratories showing the highest satisfaction. Figure 4-5 generally confirms this expectation. Laboratory rankings on six of the provision items are positively related to the rankings on four of the satisfaction items.

Among the latter, the item on caliber of professional personnel is most clearly related to several job factors, especially in the science-oriented area. Laboratories which are dissatisfied with caliber of personnel are those where there is little opportunity for freedom, using present abilities, and acquiring new abilities, as well as associating with high-level persons. Satisfaction with professional leadership shows a similar pattern.

Satisfaction with the NIH scientific reputation is related to two job factors in the prestige-health area.

How satisfied a laboratory is with promotional opportunities is directly related to the opportunities in the laboratory for contributing to the nation's health. Oddly enough however, opportunity for contributing to basic science is not related to any of the satisfaction items.

Interpretations

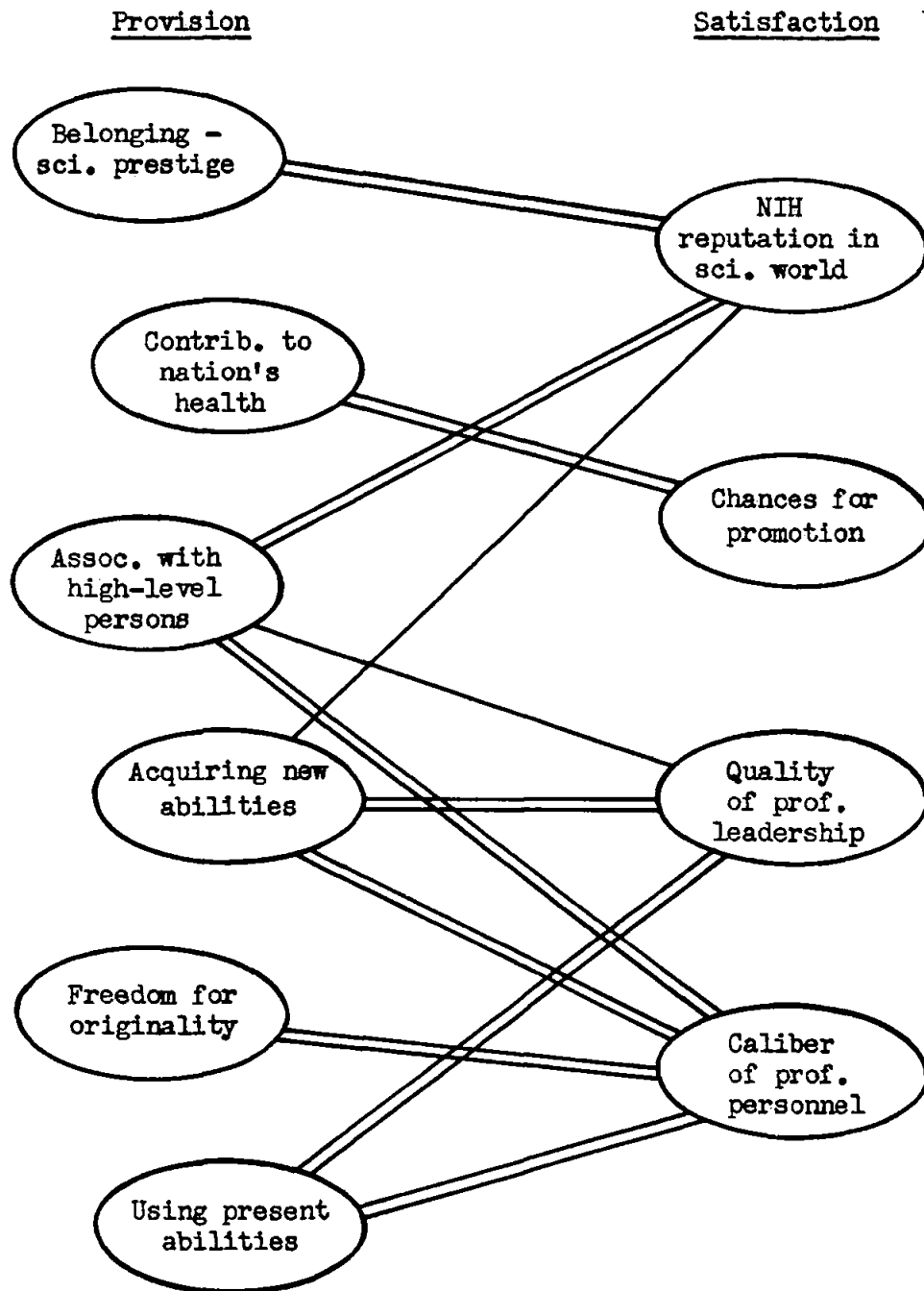
The relatively close association between several of the provision scores and the satisfaction scores suggests that dissatisfaction results to a considerable extent from variation in the actual working conditions, leadership, and policies of the various laboratories. To the extent that this is a valid interpretation, it means that the level of satisfaction expressed by the various laboratories can be used to identify and diagnose problems requiring the attention of laboratory chiefs and other administrative personnel.

We observe that laboratories having more contact with high-level persons are also more satisfied in several areas. If contacts between scientists and scientific or institute directors were increased, satisfaction with NIH reputation and caliber of personnel might rise.

The connection between nation's health and promotional opportunities serves to reinforce an interpretation from previous figures — namely that promotional chances are perceived to be better in the health-oriented laboratories.

FIGURE 4-5

Correlation Between Laboratory Ranks
on Provision of Six Job Factors and Four Satisfaction Items



6. Relationships Between Importance of Job Factors and Satisfaction

Figure 4-6 shows that the relationships between the importance attached to the various job factors are not closely associated with the satisfaction measures. Of these relationships, most are inverse or negative. Thus laboratories which attach the most importance to contributing to the nation's health are those where there is the least satisfaction with professional leadership. Laboratories where the professionals are the least satisfied with their salaries are the laboratories where the greatest importance is given to acquiring new abilities. The only positive relationship is between the laboratory rankings on the importance of belonging to an organization with prestige in the scientific world and satisfaction with the reputation of NIH.

Interpretations

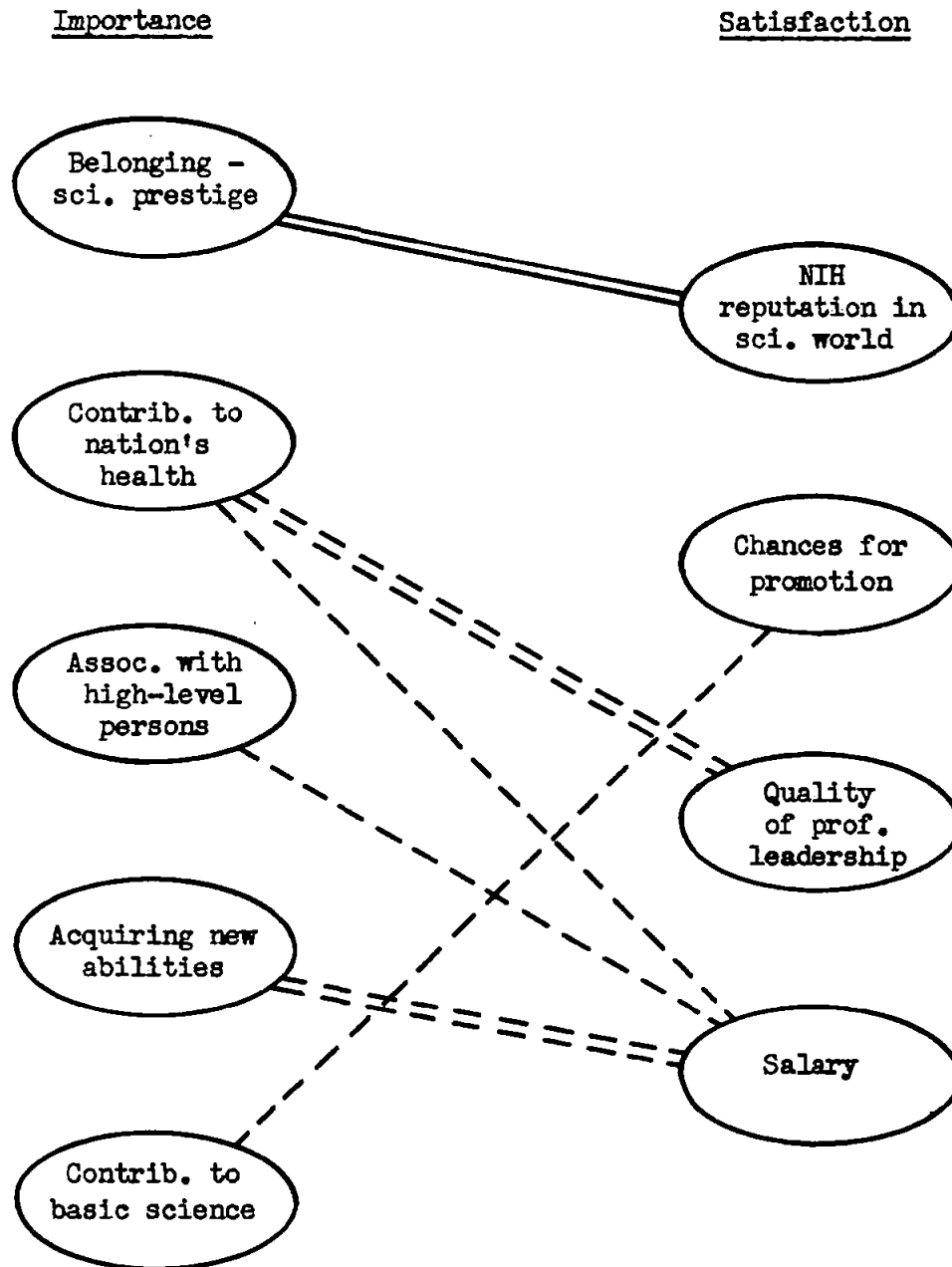
These findings generally confirm the notion that satisfaction is a function of both the strength of motivation and the provision by the environment for these motives. The stronger the motivations the lower are the satisfactions likely to be. However, satisfactions are less strongly related to motivations (Figure 4-6) than to actual provision of factors (Figure 4-5). Hence satisfaction measures can often be used to identify genuine problem areas.

Low satisfaction may have the effect of increasing motivations. For example, laboratories where a relatively high proportion of the members are dissatisfied with their salaries, may come to feel that a chance to acquire new abilities is of great importance -- as a means of improving their salaries. Figure 4-3 showed that there was no relationship between the importance of gaining new abilities and the opportunities for doing so. Are there some laboratories where the scientists are dissatisfied with salaries and anxious to learn new abilities, but where little or no opportunity is provided to improve their standing? Is this likely to be a situation where people can work effectively toward producing good research?

The negative relationship between the importance of basic science and satisfaction with chances for promotion suggests that, in this area, dissatisfaction is in part a consequence of high motivation toward science. However, an organization needs constantly to query itself about how well its system of rewards and punishments fits its goals and purposes. Is there a contradiction between what NIH administration says is done and the basis on which promotions are actually dispersed?

FIGURE 4-6

Correlation Between Laboratory Ranks
on Importance of Five Job Factors and Four Satisfaction Items



7. Factors Related to Laboratory Size

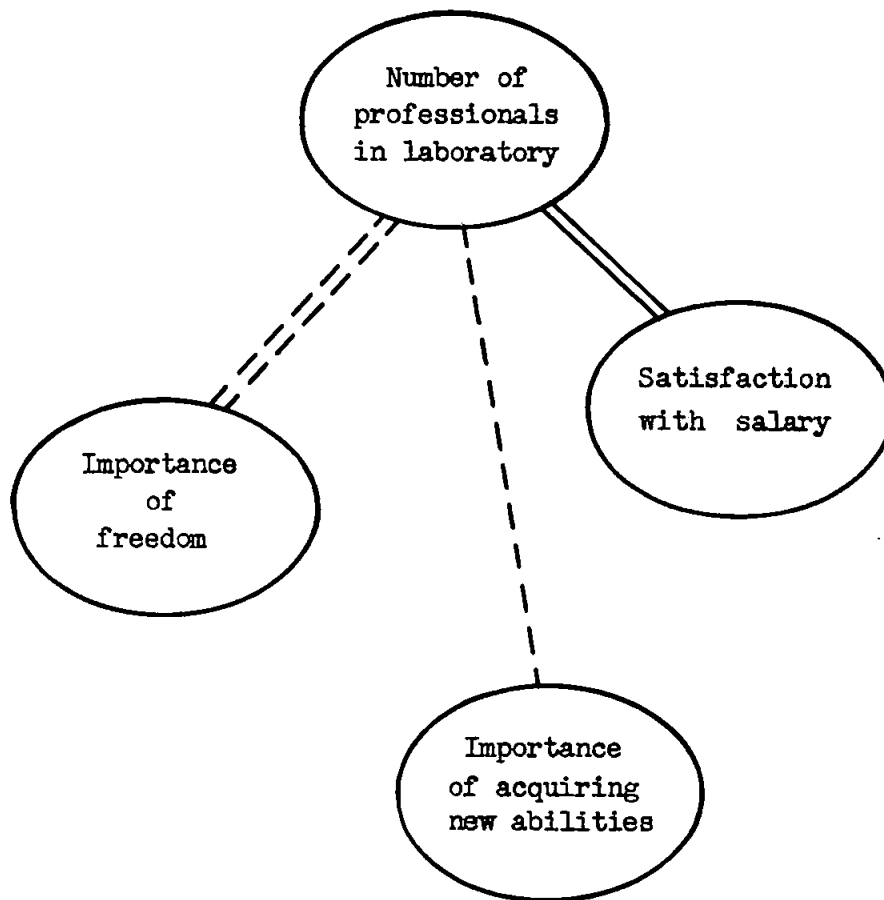
In interpreting the results of a correlational analysis it is always important to make some further analysis to check against the possibility that some extraneous factor is responsible for the results. Although this phase of our analysis of these laboratory morale factors is not complete, we have learned that laboratory size, as measured by the number of professionals in it, is related to only 3 of the 25 variables dealt with in this chapter. Figure 4-7 shows these correlations.

The larger the laboratory, the more satisfied are the laboratory professionals with their salaries. In the smaller laboratories more importance is placed on freedom for originality and on acquiring new abilities. It is possible that sheer size in a laboratory dampens initiative.

In general, the results demonstrate that laboratory size does not affect appreciably most of the variables, and hence cannot explain the patterns of relationship between them.

FIGURE 4-7

Laboratory Size Versus Related Factors



Summary

In this chapter we have examined and discussed the relationships between a number of group variables in each of several categories. After mean scores of 20 laboratories were obtained on 25 questionnaire items, the laboratories were placed in rank order, and rank-order correlations between all items were computed.

Computing relationships between many variables is a tedious task. However, interpreting the significance of a correlation matrix is much more difficult. It is suggested that the significance and potential for action of these and other research findings can only be arrived at after much careful thought and discussion involving some theoretical notions about social behavior.

Some of the major findings from this analysis are:

- 1) Laboratories do differ in consistent and meaningful ways on these measures. Hence, such measures can be used for identifying and diagnosing problems.
- 2) Two independent orientations or clusters of items appear throughout the data: a "science orientation" (contributing to basic science, freedom for originality, etc.), and a "health-prestige orientation" (contributing to the nation's health, having an important job, etc.).
- 3) In the case of the health-prestige orientation, provision for these activities is proportional to the importance attached to them.
- 4) In the case of the science orientation, provision is not proportional to importance.
- 5) Laboratories are not consistently more or less satisfied. Rather, satisfaction differs on specific items.
- 6) Provision for the science orientation appears more closely associated with several satisfaction measures than does provision for the health-prestige orientation.
- 7) Laboratory size has no overall effect on the variables involved in this study.

APPENDIX A

METHODOLOGY OF ASSESSING RESEARCH PERFORMANCE

This appendix contains additional information on the assessment procedures. It includes the instructions to assessors, a list of the groups assessed, details of the method of combining the assessment ratings into a single score for each person, and data on the sample of scientists used in analysis of research performance.

Instructions for assessors

In Appendix C of Human Relations in a Research Organization (1953) the entire set of instructions to assessors is reproduced. This includes instructions for Assessment I, current scientific performance, and Assessment II, "The scientist's current scientific performance, as compared with the maximum performance of which he is capable in view of his own background and experience."

Only data collected in Assessment I have been scaled and utilized in the present analysis. Accordingly, only the instructions applicable to it are reproduced below.

Human Relations Study of NIH
Assessment of Scientific Performance

January 28, 1953

INSTRUCTIONS FOR ASSESSORS

The names of the scientists you are to assess within a particular laboratory or a particular discipline are listed alphabetically on the attached sheets. You will be asked to make two separate assessments on each set of names; therefore duplicate lists are provided. We would like your opinion as to the relative standing of these scientists with respect to each other. All may stand high; but within this list we want you to indicate which ones are higher, which lower.

You may wish to indicate:

two groups: (1) Higher; (2) Lower
or three groups: (1) Highest; (2) Next highest; (3) Third highest
or four groups: (1) Highest; (2) Next highest; (3) Third highest;
(4) Fourth highest, etc.
or more.

We suggest you read through the list and mark as "1" the names that stand highest; then mark "2" the names that stand next highest; and so on.

Use as many groups as you need to show the differences that exist; in general you may need three or four. You may assign several people to the same group, providing you feel they are all about equal.

Cross off the names of any whom you feel you do not know well enough to assess; and cross off your own name without assessment.

Following are the definitions of the two separate assessments to be made. Please read them carefully.

Assessment I: The scientist's current scientific performance as compared with other NIH scientists on the same list.

By a person's "scientific performance" we have in mind factors such as:

- Originality and creativeness in locating important problems, or in turning up fruitful leads for attacking the problems
- Wisdom and judgment in deciding which lead is most likely to pay off, or which methods to apply

--continued

- Rigor of thought and precision of methods in carrying out the work and drawing conclusions
- Persistence, industriousness and efficiency in carrying through a project; keeping after the task in hand with a minimum of delays and wasted activity
- Contribution to the work of others, by means of knowledge, insight, and stimulation of ideas. Part of a person's contribution may consist of guiding or stimulating the work of other scientists; or perhaps his "scientific performance" as a whole may depend largely on this factor.

All these factors may contribute to a person's effectiveness. However, some high performers may be outstanding in only one or two of these aspects.

By his "current" performance we mean either work he has completed over the last few years, or work he is currently doing which is likely to "pay off" in the next few years.

To make the assessment more concrete, you may think of the problem this way:

Suppose a sum of money is being made available for research in the area these people are working in. You are being asked to give advice on distributing these funds in research grants or contracts to a small group of scientists — either as individuals or as a team — who, in your estimation, are best equipped to turn out the best possible research within the next few years. (You are not being asked to work with these people, so your personal relations with them should be disregarded.) On the basis of what these scientists have done, are doing, and therefore are likely to do in the next few years, which of them would you recommend first?

Consider what the person has actually done or is now doing, regardless of his age and experience, and regardless of his grade or status. We plan to take the latter factors into consideration in our analysis; and we will compare each person with others of similar age and experience, and status. In your own assessments, therefore, consider only the person's performance as such.

Try not to be influenced by the field in which a person works -- as, whether that field is "promising" or "sterile", or whether it falls more in "applied" areas so-called, or more in "basic" areas. Rather, consider the way he performs within his area, in terms of the factors listed above.

Groups within which
assessments were made

In all, 72 scientists served as assessors. Of these, 54 gave evaluations of the following laboratory groups:

NIAMD

- L. Biochemistry & Nutrition
- L. Pathology & Pharmacology
- L. Chemistry
- L. Physical Biology

NCI */

- L. Biochemistry
- L. Biology
- L. Biophysics
- L. Chemical Pharmacology

NIDR

NHI

NIMH

NMI

- L. Biologics Control
- L. Infectious Diseases
- L. Tropical Diseases

Also, 52 scientists assessed the following disciplines (a few assessors rated more than one field):

- Biochemistry & Nutrition
- Enzymes & Metabolism
- Endocrinology
- Organic Chemistry
- Pharmacology
- Pathology
- Physiology
- Biophysics
- Cellular Functioning
- Virology
- Microbiology

*/ In NCI, the Laboratory of Pathology and the Endocrinology Branch were entirely included in the corresponding fields of work and were not assessed separately as laboratories.

Obtaining a single score
for each scientist

For analysis purposes it was necessary to combine the judgments of various assessors into a single score for each scientist. In doing so, two objectives were sought.

(1) First, it was desirable to utilize only those data in which we could place high confidence. Toward this end the following four steps were taken:

(a) A few assessors were dropped who provided little information. Included here were those who evaluated fewer than one-fifth of their respective lists, and those who placed nearly all their names (85% or more) in a single "high" or "low" category.

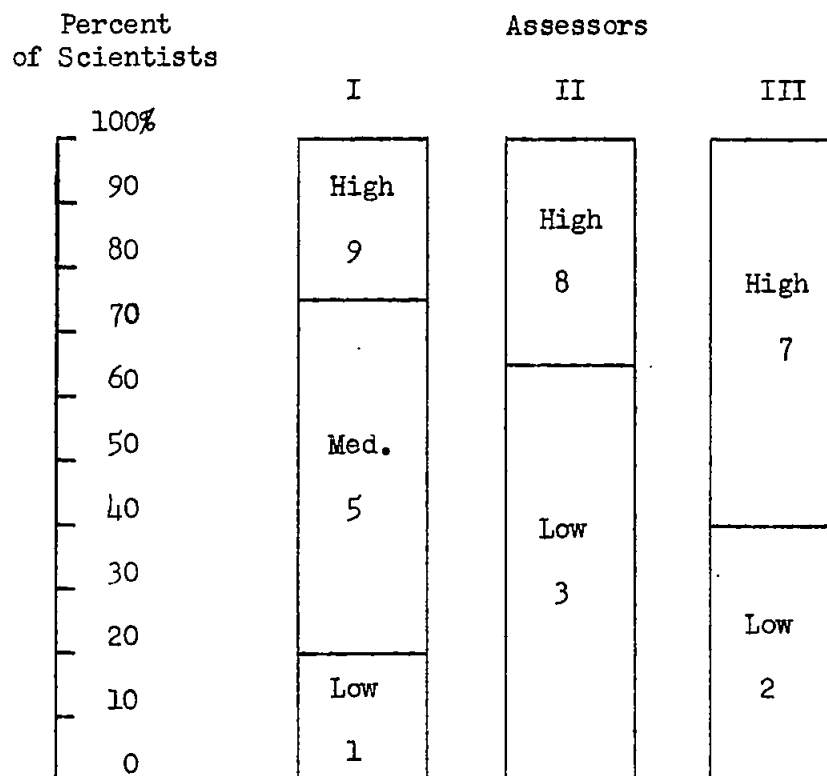
(b) A few more assessors were dropped whose evaluations were markedly divergent from those of the other judges in the same area. In all, 9 assessors were dropped for either of these reasons.

(c) Only those scientists who received judgments from two or more of the remaining assessors were used.

(d) In a few cases a scientist was eliminated if the assessors from his laboratory or discipline group disagreed markedly in their evaluations of him. The criterion adopted for "marked disagreement" is explained below.

(2) After these eliminations the next objective was combining the judgments from assessors within each laboratory and within each discipline. To do this, the qualitative categories of "high" or "medium" or "low" performance had to be given a numerical score, so that scores from several judges could be averaged. Assigning of scores was complicated by the fact that assessors were free to make as many distinctions as they saw fit, and to assign as many persons to each category as they wished. Some judges made one discrimination between "high" and "low" performers, while others preferred to make several distinctions. (For convenience, categories containing fewer than 15% of the names were combined with an adjacent category.)

A numerical score of 1 to 9 was therefore assigned to each category of judgment, depending on the proportion of scientists an assessor assigned to each of his categories. To illustrate this process, we show some hypothetical data from three assessors evaluating the same group of scientists.



Each category was assigned a score corresponding to the decile nearest the middle of the category. For instance, Assessor I gives 25% of the group High ratings. The middle of this category falls at the 87th percentile, or the ninth decile; his High category therefore receives a score of 9.

For Assessor III, the middle of his High category falls at the 70th percentile, so this category receives a score of 7. This is simply another way of saying that it is easier for a scientist to fall in his top category and therefore the score is lower than that of Assessor I.

The combined score of the three assessors on a given scientist is an average of the three category scores. A scientist rated High-High-High (numerically equivalent to 9-8-7) would receive a combined score of 8.

We mentioned above that certain scientists were eliminated if assessors disagreed in their evaluations of him. In the hypothetical example, a scientist rated Low-High-Low would be eliminated. Note that in the

opinion of Assessor I this man has a percentile rank no higher than 20, while in Assessor II's opinion he is no lower than 65 -- a discrepancy of 45 percentile points. An arbitrary decision was made that all discrepancies of 30 or more points were "markedly discrepant", and such cases were dropped.

By contrast, however, a rating of High-Low-High in this case would not lead to elimination, since there the discrepancy may be as low as 15 points.

By and large, the ratings were remarkably consistent. Altogether, 577 individual scorings were made in this way (including scorings of the same scientist in two or more of the laboratories and disciplines). Of this number, 64% showed no discrepancies as defined above, while 75% had discrepancies of less than 10 points. Only 8% of the total scorings were eliminated because of "marked discrepancies."

In terms of individuals, however, fewer than 5% were discarded; some individuals lost their discipline score but retained their laboratory score, or vice versa.

(3) For those individuals having both a laboratory and a discipline score, relatively high correlations between the two were found to exist (r 's range from .47 to .97 for different pairs of groups; median $r = .84$). Therefore we felt justified in averaging the two scores where both existed, and in using either of the scores if only one existed.

Some data on those scientists used in the research performance analysis

As Table A-1 shows, performance scores were obtained for 266 scientists at NIH. Of these, the large majority received both a laboratory and a discipline score. It is interesting to note that 90% of the scientists received usable laboratory scores, compared with 72% who received discipline scores.

Table A-2 gives a detailed breakdown on those who were assessed and not assessed. Assessments were obtained on 80% of the scientists who filled out questionnaires. Of the total group, 234 scientists were selected for the analysis in Chapter I. Usable assessments were obtained on 87% of this selected group.

TABLE A-1

Scientist Having Usable
Laboratory and/or Discipline Scores

	<u>N</u>	<u>%</u>
Scientists having:		
--Both Laboratory and Discipline scores	166	62%
--Laboratory scores only	73	28
--Discipline scores only	28	10
	<u>266</u>	<u>100%</u>

TABLE A-2

Breakdown of Scientists
With and Without Assessments

	Assessments	
<u>Scientists selected for the analysis in Chapter I</u>	<u>Ob- tained</u>	<u>Not Obtained</u>
Research scientists having Ph.D and/or M.D., including unit and section chiefs	204	
Same, but having no assessment because:		
--Not assessed (due to unfamiliarity, etc.)		19
--Only one assessor		7
--Markedly discrepant assessment pattern		4
<u>Remainder excluded from analysis</u>		
Laboratory chiefs, Scientific Directors, Institute Directors, etc.	20	20
Grade less than GS-9; non-doctoral; others not included above	42	18
	<u>266</u>	<u>68 = 334</u>
Percent of total institute scientists filling out questionnaire	80%	20% = 100%

APPENDIX B

List of Laboratory Groups Used for Analysis (Intramural professionals only)

	Approx. <u>N</u>
1. National Cancer Institute	
a. Laboratory of Biochemistry	18
b. Laboratory of Biology	23
c. Laboratory of Biophysics	16
d. Endocrinology Branch	6
e. Laboratory of Chemical Pharmacology	11
f. Laboratory of Pathology	<u>10</u>
	84
2. National Heart Institute	
a. Laboratory of Cellular Physiology	11
b. Laboratory of Chemical Pharmacology	6
c. Laboratory of Chemistry of Natural Products	9
d. Laboratory of Kidney and Electrolyte Metabolism	7
e. Laboratory of Clinical Investigation	<u>10</u>
	43
3. National Institute of Arthritis and Metabolic Diseases	
a. Laboratory of Biochemistry and Nutrition	19
b. Laboratory of Pathology and Pharmacology	24
c. Laboratory of Chemistry	28
d. Laboratory of Physical Biology	<u>34</u>
	105
4. National Microbiological Institute	
a. Laboratory of Biologics Control	15
b. Laboratory of Infectious Diseases	33
c. Laboratory of Tropical Diseases	25
d. Rocky Mountain Laboratory	<u>15</u>
	88

	<u>Approx. N</u>
5. National Institute of Mental Health	
a. Laboratories of Neurophysiology and Socio-Environmental Studies	<u>10</u>
Grand Total	330

UNIVERSITY OF MICHIGAN
INSTITUTE FOR SOCIAL RESEARCH
ANN ARBOR, MICHIGAN
RENSIS LIKERT, DIRECTOR

SURVEY RESEARCH CENTER
ANGUS CAMPBELL, DIRECTOR

Human Relations Study of NIH

October, 1952

OPINION QUESTIONNAIRE

Form 1

To NIH personnel:

Most of the questions in this opinion questionnaire have been designed so that you can answer them by checking one box corresponding to one of several alternative answers.

In each case, a short arrow (→ or ↓) indicates the row of boxes from which you are to make a choice. We realize it would be more convenient for you if the rows of boxes were always horizontal or always vertical. However, the nature of the questions makes it impossible to use a uniform format. Simply follow the guiding arrow in each case.

Note that in some questions you are asked to check *any* answer which applies, and in other questions you are asked to *rank* the answers in order of your preference, rather than check one.

Pay no attention to the numbers next to each arrow and box. These numbers are for punching the data on IBM cards.

* * *

On each question, check the best-fitting answer *even if it does not fit exactly*; feel free to make marginal comments or qualifications as you go along. Extra space is provided at several points for additional comments.

Do not hesitate to express your subjective feelings, even if based on slight evidence. These feelings are part of the social facts out of which relations in an organization are built. All we ask is that you speak frankly for yourself.

* * *

The opinion questionnaire is divided into two parts. Part One (questions 1 to 42) deals mainly with people and groups. Part Two (questions 43 to 65) deals mainly with your job and conditions in the working environment.

It is not necessary to answer the whole questionnaire at one time. But please do not discuss the answers with anyone else before you finish, or before the other person finishes. It is essential to get each person's own opinion and independent thinking.

When you are through, please seal your fact form and questionnaire in the enclosed envelope and give personally to a Michigan staff member.

Questionnaire number _____
Form 1

PART ONE: PEOPLE AND GROUPS

Card 02

Overall evaluation of NIH

1. Considering *all of the job factors* that are important to you, and considering your entire experience at NIH, how does NIH compare with the *best of the following kinds of organizations* that you know something about, as a place to work? When you consider all factors together, is the net result at NIH generally better, about the same, or generally not so good as at the best of these other organizations?

If you know very little or nothing about a particular situation below, check only the box to the far right.

(Check one box in each line)

	NIH is generally better	NIH is about the same	NIH is generally not as good	No opinion; or know little about it
Best of other US PHS organizations 11→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Best hospitals (government or private) 12→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Best universities 13→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Best of other government research organizations 14→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Best of other government non-research organizations 15→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Best industrial research organizations 16→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y

Groups and relations among groups

2. In your own experience, have you noticed any *strains or frictions* in relations between members of different groups at NIH such as the ones listed below? Or have you observed that no such strains or frictions exist, that working relations between groups are good? (either inside your own Institute or in relations with other Institutes?)

(Please check one box in each line)

	Severe strains	Moderate strains	Slight or no strains	No opinion
Extramural group (research grants, control, information, etc.) with the intramural group (laboratory and field research) 17→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
M.D.'s with Ph.D.'s 18→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Administrative officers (and their assistants) with professional personnel 19→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Commissioned Corps with the Civil Service group of professionals 20→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
People in other Institutes with people in my own Institute ... 21→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y

Add here any comments you wish about specific sources of good or poor working relations among groups:

3. Individuals at NIH may belong to several parts of the total organization such as a Section, a Laboratory, an Institute, US Public Health Service, etc. But each person may have a stronger *feeling* of belonging to some of these parts than to others. Which of them do you *mainly think of yourself as belonging to*? Where do you feel most strongly that you tie in?

Please indicate below how strong a *sense of belonging* you have toward each part of the organization.

If you are not located in some of the following parts, check only the box to the far right.

(Check one box in each line)

	Very strong sense of belong'g	Strong sense of belong'g	Moder- ate or slight sense	No sense of belong'g	Dislike belong'g to this group	No opin- ion; or not in one
My Unit (if any)	22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
My Section (if any)	23→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
My Laboratory or Branch (if any)	24→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
If you are in an administrative unit called by some other name, list here:						
..... 25	26→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
My Institute as a whole*	27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
NIH as a whole	28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
Commissioned Corps as a whole	29→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
US Public Health Service as a whole	30→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
Federal Security Agency as a whole	31→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
US government as a whole	32→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y

*People located in the Clinical Center, Division of Research Grants, or Office of the Director should consider this their "Institute".

4. In your opinion, *how good a job* are the professionals in the following parts of the organization doing, in terms of their scientific or other professional work?

If you are not located in some of the following parts, check only the box to the far right for this group.

(check one box in each line)

	Almost all doing outstanding job	Most out- standing; remainder adequate	About even between outst'g and adeq.	Few out- standing; rest adequate	Few out- standing; few inadeq.	None outst'g; few inadeq.	No opin- ion; or not in one
My Unit (if any)	33→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> y
My Section (if any)	34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> y
My Lab or Branch (if any)	35→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> y
Other administrative unit to which I belong:							
..... 36	37→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> y
My Institute	38→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> y
NIH as a whole	39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> y

40-46 blank

Significant contacts for you

5. List below the names of from 5 to 15 people within NIH with whom some contact is of *greatest significance to you in your work*.

These people may be anywhere in NIH—inside or outside your own Laboratory, Branch, or Institute, at Bethesda or other NIH stations; they may be at any level in the organization.

List them *roughly in order of significance*—the five *most* significant first, then the five next most significant, and so on. Please give first initial.

Five most significant:

_____ 47- _____
 _____ 59- _____
 _____ Card 03
 _____ 11- _____
 _____ 23- _____
 _____ 35- _____

Five next most significant:

_____ 47- _____
 _____ 59- _____
 _____ Card 04
 _____ 11- _____
 _____ 23- _____
 _____ 35- _____

Five next in significance:

_____ 47- _____
 _____ 59- _____
 _____ Card 05
 _____ 11- _____
 _____ 23- _____
 _____ 35- _____

If you wish to list more than 15 names, please do so on an extra sheet of paper.

Please leave the following lines blank, for the time being. You will be asked about some specific persons in question 9.

(a) _____ 47- _____
 (b) _____ 59- _____
 _____ Card 06
 (c) _____ 11- _____
 (d) _____ 23- _____
 (e) _____ 35- _____
 (f) _____ 47- _____
 (g) _____ 59- _____

5a. How frequently do you contact each of these persons, as a general rule?

(check one box for each person)

Sev'l times a day	About once a day	Sev'l times a week	Sev'l times a month	Less often
51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
63→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
63→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
63→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
63→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
63→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

6. Would you like to have *more* contact with this person than you now have (assuming that both of you could give the time to it)?

Would you like *less* contact than you now have? Or is your present amount of contact satisfactory?

(Check one box for each person)

Want more con- tact	Pre- sent am't o.k.	Want less con- tact	No opin- ion
52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
64→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
16→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
40→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
64→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
16→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
40→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
64→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
16→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
40→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
64→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y

7. Under what conditions do most of your contacts with this person occur (if at all)?

- (a) the two of you talking *in person*
- (b) the two of you talking *by telephone* or intercommunication system
- (c) an *informal group* of colleagues or friends—e.g., luncheon gathering or journal club—mainly for exchange of shop talk, conversation, etc.
- (d) a *committee or staff meeting* which is mainly for making *decisions or recommendations*
- (e) a *large meeting* or seminar which is mainly for obtaining scientific or administrative *information*

(Check *one or two*—no more—of most usual conditions)

(a) Two of us in person	(b) Two of us by phone	(c) Informal group or journal club	(d) Comm., staff, for de- cisions	(e) Large meet'g., for in- format.
53→ <input type="checkbox"/> 1	54 <input type="checkbox"/> 1	55 <input type="checkbox"/> 1	56 <input type="checkbox"/> 1	57 <input type="checkbox"/> 1
65→ <input type="checkbox"/> 1	66 <input type="checkbox"/> 1	67 <input type="checkbox"/> 1	68 <input type="checkbox"/> 1	69 <input type="checkbox"/> 1
17→ <input type="checkbox"/> 1	18 <input type="checkbox"/> 1	19 <input type="checkbox"/> 1	20 <input type="checkbox"/> 1	21 <input type="checkbox"/> 1
29→ <input type="checkbox"/> 1	30 <input type="checkbox"/> 1	31 <input type="checkbox"/> 1	32 <input type="checkbox"/> 1	33 <input type="checkbox"/> 1
41→ <input type="checkbox"/> 1	42 <input type="checkbox"/> 1	43 <input type="checkbox"/> 1	44 <input type="checkbox"/> 1	45 <input type="checkbox"/> 1
53→ <input type="checkbox"/> 1	54 <input type="checkbox"/> 1	55 <input type="checkbox"/> 1	56 <input type="checkbox"/> 1	57 <input type="checkbox"/> 1
65→ <input type="checkbox"/> 1	66 <input type="checkbox"/> 1	67 <input type="checkbox"/> 1	68 <input type="checkbox"/> 1	69 <input type="checkbox"/> 1
17→ <input type="checkbox"/> 1	18 <input type="checkbox"/> 1	19 <input type="checkbox"/> 1	20 <input type="checkbox"/> 1	21 <input type="checkbox"/> 1
29→ <input type="checkbox"/> 1	30 <input type="checkbox"/> 1	31 <input type="checkbox"/> 1	32 <input type="checkbox"/> 1	33 <input type="checkbox"/> 1
41→ <input type="checkbox"/> 1	42 <input type="checkbox"/> 1	43 <input type="checkbox"/> 1	44 <input type="checkbox"/> 1	45 <input type="checkbox"/> 1
53→ <input type="checkbox"/> 1	54 <input type="checkbox"/> 1	55 <input type="checkbox"/> 1	56 <input type="checkbox"/> 1	57 <input type="checkbox"/> 1
65→ <input type="checkbox"/> 1	66 <input type="checkbox"/> 1	67 <input type="checkbox"/> 1	68 <input type="checkbox"/> 1	69 <input type="checkbox"/> 1
17→ <input type="checkbox"/> 1	18 <input type="checkbox"/> 1	19 <input type="checkbox"/> 1	20 <input type="checkbox"/> 1	21 <input type="checkbox"/> 1
29→ <input type="checkbox"/> 1	30 <input type="checkbox"/> 1	31 <input type="checkbox"/> 1	32 <input type="checkbox"/> 1	33 <input type="checkbox"/> 1
41→ <input type="checkbox"/> 1	42 <input type="checkbox"/> 1	43 <input type="checkbox"/> 1	44 <input type="checkbox"/> 1	45 <input type="checkbox"/> 1

8. Are the activities of this person generally *helpful* to you, or are his activities sometimes a *hindrance*? Both? Neither help nor hinder?

(Check one box for each person)

Usually very helpful	Usually of some help	Usually hinder my work	Both help & hinder	Neither; or no effect	Have no idea
58→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
70→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
46→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
58→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
70→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
46→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
58→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
70→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
46→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
58→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
70→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y
46→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> y

9. Please write below the names of the following people:

- (a) your immediate chief (head of your administrative unit): _____
- (b) the person above your chief: _____
- (c) some other person to whom you report (if any); the person referred to in the Fact Form, question 10: _____
- (d) a colleague at your own level and working under your chief; among the people you think of, select the one whose name is alphabetically nearest to yours:*
- (e) a professional at GS-12 or Full Grade or higher, working under you (if any); the person you think of whose name is alphabetically nearest to yours:*
- (f) a professional at GS-9 or 11, or Assistant, or Senior Assistant Grade, working under you (if any); the person you think of whose name is alphabetically nearest to yours:*
- (g) a professional at any level (GS-9 or Assistant Grade or higher), working *below any of the people under you* (if any); again, select a person alphabetically near to you:*

*We ask for this alphabetical selection in order to assure a relatively random choice among the people you think of, not simply the person you know best.

Now, please turn back to question 5, and enter the above persons' names (or simply their initials) in the corresponding spaces at the bottom of the page, and fill in questions 5a-8 for these persons.

If you have already named one of these persons as a "significant contact" on page 4, do not answer again for this person.

* * *

Card 07

The following four questions concern the same people you have named above.

10. To what extent do each of these persons' activities or decisions affect your work, directly or indirectly?

(check one box for each person)

	Great deal of effect on my work	Quite a bit of effect	Some effect on my work	Little or no effect on my work	Have no idea
(a) chief	11→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(b) person above chief ..	12→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(c) other I report to ...	13→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(d) colleague	14→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(e)	15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(f)	16→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(g)	17→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y

11. If any of these persons' activities affect your work, to what extent do you feel you could influence him in regard to these activities (if you wanted to)?

I could probably influence him:

(check one box for each person)

	A great deal	Moderately	A little	Not at all	Have no idea
(a) chief	18→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(b) person above chief ..	19→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(c) other I report to ...	20→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(d) colleague	21→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(e)	22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(f)	23→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(g)	24→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y

12. How strongly do you enjoy your contacts with each person—whether you like him personally, gain professional stimulation from him, or enjoy contacts with him for any other reason?

(check one box for each person)

	Very strong enjoyment	Fairly strong enjoyment	Mild enjoyment	Little or no enjoyment	No opinion
(a) chief	25→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(b) person above chief ..	26→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(c) other I report to ...	27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(d) colleague	28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(e)	29→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(f)	30→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(g)	31→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y

13. To what extent do you have confidence in this person's intentions and motives? Do you feel he is always sincere in his dealings with others? Does he really mean what he says?

(check one box for each person)

I tend to feel that this person is sincere in his intentions—that he really means what he says:

	Always	Most of the time	Some of the time	Seldom	No opinion
(a) chief	32→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(b) person above chief ..	33→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(c) other I report to ...	34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(d) colleague	35→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(e)	36→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(f)	37→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(g)	38→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y

Top-level Directors and Administrative Officers

The following questions concern your opinions about the way four persons or groups are performing their functions:

- A. Your own Institute Director
- B. The Administrative Office in your Institute (your Institute's Executive or Administrative Officer, together with any of his immediate staff)
- C. The NIH Director, together with the two Associate Directors
- D. The NIH Executive Officer, together with the Administrative Branch Chiefs (heading Buildings Management, Personnel, Financial Management, Laboratory Aids, Purchase and Supply, Organization and Methods, and Safety).

14. How familiar do you feel with the general activities and major decisions of each of these individuals or groups?

	A. Insti- tute Direc- tor (check one) ↓ 39	B. Inst. Admin. Office (check one) ↓ 40	C. NIH Direc- tor & Assoc. (check one) ↓ 41	D. NIH Exec., Branch Heads (check one) ↓ 42
I feel that I have:				
A clear idea of their general activities and major decisions	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
A fairly clear idea; or mixed—clear about some activities, little idea about others	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Little idea about these matters...	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
I have no idea at all about their activities and decisions	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4

15. Regarding each of these individuals or groups, how competently do you feel they are *performing their functions*? Regardless of whether their intentions are good or poor, what kind of a job are they *actually doing*? Please give your impression, even if you are not sure.

	A. Insti- tute Direc- tor (check one) ↓ 43	B. Inst. Admin. Office (check one) ↓ 44	C. NIH Direc- tor & Assoc. (check one) ↓ 45	D. NIH Exec., Branch Heads (check one) ↓ 46
I feel that in general they are doing:				
A very competent job	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
A fairly competent job	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Competent in some respects, not in others	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
A rather poor job	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4
I have no impression at all	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y

Note: In Part Two of the questionnaire, you will have a chance to comment in detail on the various auxiliary services provided in your Institute and in the central administration.

16. Compared to the situation a few years ago, how are the functions of these positions being carried out? (Since you are asked to evaluate the *job being done* now as compared with before, you need not be concerned with the fact that some of the personnel may have changed in this period.) Please give your opinion, even though you are not sure.

	A. (check one) ↓ 47	B. (check one) ↓ 48	C. (check one) ↓ 49	D. (check one) ↓ 50
I feel that the job being done at the present time is:				
Considerably better than before.	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
A little better than before	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2
About the same as before	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
Not as good as before	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4
No opinion	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y

17. Listed below are some of the specific points about the way these people may be performing their functions. Please check *any* of these points which apply, in your personal experience.

	A. (check any) ↓	B. (check any) ↓	C. (check any) ↓	D. (check any) ↓
This person (or some members of this group):				
Exert undue influence over decisions about objectives or operations of professional programs.	51 <input type="checkbox"/>	57 <input type="checkbox"/>	63 <input type="checkbox"/>	69 <input type="checkbox"/>
Do their best to relieve professional staff of routine duties, paper-work, etc.	52 <input type="checkbox"/>	58 <input type="checkbox"/>	64 <input type="checkbox"/>	70 <input type="checkbox"/>
Deliberately withhold information about activities and decisions of concern to the professional staff	53 <input type="checkbox"/>	59 <input type="checkbox"/>	65 <input type="checkbox"/>	71 <input type="checkbox"/>
Consult thoroughly with professional staff before making decisions of concern to them	54 <input type="checkbox"/>	60 <input type="checkbox"/>	66 <input type="checkbox"/>	72 <input type="checkbox"/>
Put too much emphasis on procedures, forms, or regulations as such	55 <input type="checkbox"/>	61 <input type="checkbox"/>	67 <input type="checkbox"/>	73 <input type="checkbox"/>
Are strongly interested in securing quick and high quality assistance for professional staff	56 <input type="checkbox"/>	62 <input type="checkbox"/>	68 <input type="checkbox"/>	74 <input type="checkbox"/>

Add here any other comments you wish about the way these persons are performing their job.

The chiefs you work under

Card 08

18. To what extent do the following persons have the kind of *scientific or other professional qualifications* to make sound suggestions, comments, judgments, etc. about the general *problem area* in which you are currently working?

The persons shown below are the same as those you named in question 9:

- (a) your chief (head of the administrative unit you are a member of)
 (b) the person above your chief
 (c) any other person to whom you report (omit answer if no such person)

	(a) My chief (check one) ↓ 11	(b) Person above my chief (check one) ↓ 12	(c) Other person I re- port to (check one) ↓ 13
Concerning my current professional problem area, this person:			
Is very well qualified; his suggestions, comments, or judgments (if any) would always be sound	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Is moderately well qualified; his suggestions, etc. (if any) would for the most part be sound	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Has a few qualifications; his suggestions, etc. (if any) might occasionally be sound	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
Is not qualified in my professional problem area; could not make sound suggestions, etc. in this area	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4
No opinion	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y

19. How do you feel about the *professional leadership or stimulation* which each of these persons gives (if any), bearing on your own scientific or other professional work?

	(a) My chief (check one) ↓ 14	(b) Person above my chief (check one) ↓ 15	(c) Other person I re- port to (check one) ↓ 16
Gives excellent leadership or stimulation which I find useful in my professional work	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Gives adequate leadership which I find moderately useful in my work	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Puts time into leadership that bears on my work, but it is not especially useful to me	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
His efforts at professional leadership are more often a hindrance to my work than a help	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Gives little leadership which bears on my own work; I would like more, since his ideas would be useful	<input type="checkbox"/> 5	<input type="checkbox"/> 5	<input type="checkbox"/> 5
Gives little leadership which bears on my own work, but I am satisfied—I do not want any more	<input type="checkbox"/> 6	<input type="checkbox"/> 6	<input type="checkbox"/> 6
No opinion	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y

20. How do you feel about the way in which each of them makes *evaluations* about the *quality of work you are doing?* (Either your work in your professional specialty, or your other duties.)

	(a) My chief (check one) ↓ 17	(b) Person above my chief (check one) ↓ 18	(c) Other person I re- port to (check one) ↓ 19
Makes accurate evaluations, based on sound information about all of my work	<input type="checkbox"/> 1	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Makes evaluations which are partly accurate, partly inaccurate; or based on only part of my work	<input type="checkbox"/> 2	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Makes evaluations which are largely inaccurate, or based very little on what I actually do	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<input type="checkbox"/> 3
Does not attempt to evaluate my work, although I would like him to do so	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Does not attempt to evaluate my work, and I prefer it this way	<input type="checkbox"/> 5	<input type="checkbox"/> 5	<input type="checkbox"/> 5
No opinion; or don't know what he does by way of evaluation	<input type="checkbox"/> y	<input type="checkbox"/> y	<input type="checkbox"/> y

21. Consider a situation where you want the approval of higher-ups for some large expenditure you want to make, or for some important project you want to undertake. Suppose you have talked it over with your chief (the head of your administrative unit) and he has expressed agreement with your views. *How much can you rely on your chief to back you up*, in presenting your position and securing approval from higher-ups?*

	(check one) ↓ 20
I can usually rely on him to back me up very effectively in getting approval from higher-ups	<input type="checkbox"/> 1
I can rely on him to do his best at backing me up, but he does not have much influence over higher-ups	<input type="checkbox"/> 2
He could influence higher-ups if he wanted, but I cannot rely on him much to back me up	<input type="checkbox"/> 3
He has little influence with higher-ups, and therefore I do not expect him to back up my position	<input type="checkbox"/> 4
I have no idea whether I could rely on him or not	<input type="checkbox"/> y

*21a. You may prefer to answer this alternative question:

How much can you rely on your chief to back you up regarding *important decisions you have already made*, in areas where he has delegated responsibility to you?

Check here if answering this alternative 21 ☐ 1

The following three questions concern the relations between you and the chiefs you work under, in the following three areas:

- determining work problems or major assignments;
- substantial new expenditures out of this year's budget;
- formulating interpretations and conclusions.

Under each topic are several different ways in which one of your chiefs might operate.

A. Which of these methods is *most typical* of the way this person *actually* functions—the method he uses most frequently? (or the item which best describes his most frequent method?) Rank this “1”. Number as “2” the item which is next most typical of the way he actually functions, and so on. You need not rank any item he never uses.

B. Second, please rank the same methods in the order that you *would prefer* to see this person function. Number as “1” the method you would most prefer him to use, number as “2” the method you would prefer next, and so on through *all* the items, including those he does not actually use. Number as “4” the method you would *least* prefer him to use.

For each topic or area, please check whether:

- your chief (head of your administrative unit), or
- the *other* person to whom you may report (if any)

is more likely to be involved in such a matter concerning you; and answer the question in terms of that person. If *neither* of these is likely to be involved in the matter, check this, and skip the question.

22. What are the actual and preferred relations between your chief and you, in determining what concrete *work problems or assignments* or follow-up steps you (or your staff) will work on next? (Assume that the general area of work has already been established.)*

Check whether the person more likely to be involved in this is:

22

your chief ☐1 other person ☐2 neither; omit ☐0

In column A rank the items according to what is *actually* the most typical or frequent, starting with “1”; in column B rank the methods as you would *prefer* them used, starting with “1”.

	Column A <i>Actually</i> occurs (Please rank)	Column B <i>Prefer</i> to see done (Please rank)
In regard to work problems or assignments:		
a. The chief talks the work over thoroughly with me, and gives considerable weight to my views when he makes the decisions (or recommendations to higher-ups)	23_____	27_____
b. The chief examines the work to date, and he himself makes whatever decisions or recommendations he feels are best	24_____	28_____
c. The chief talks it over with me (and perhaps with other people working on these problems), and we jointly formulate the decisions or recommendations	25_____	29_____
d. Such decisions or recommendations are up to me (or my staff); my chief simply gives routine approval	26_____	30_____

*22a. If your work seldom requires a decision as to assignments, you may answer an alternative question: How are decisions made about *general policies governing your work procedures*?

If so answering, check here..... 31☐1

23. Suppose that the work you (or your staff) are doing appears to require a *substantial new expenditure* out of current funds—an item such as a large piece of equipment, an extra assistant, etc., not previously provided for. What are the actual and preferred relations between your chief and you, in deciding whether funds are to be used for this new item?

Check whether the person more likely to be involved in this is:

your chief ☐1 other person ☐2 neither; omit ☐0

	Column A <i>Actually</i> occurs (rank)	Column B <i>Prefer</i> to see done (rank)
In regard to such a request for extra funds:		
a. The chief talks the matter over with me thoroughly, and gives considerable weight to my views when he makes the decision (or recommendation to higher-ups)	33_____	37_____
b. The chief himself makes whatever decision or recommendation he feels is best	34_____	38_____
c. The chief consults with me (and perhaps with other people at my level) and we jointly formulate the decision or recommendation	35_____	39_____
d. I (or my staff) have already received an allotment to cover expenditures, and we make our own decision (or recommendation) within this allotment; chief simply gives routine approval.	36_____	40_____

24. In the extramural as well as the intramural program, professional articles are written summarizing the results of investigations, and formulating *interpretations and conclusions*. In those cases where *your work has contributed to the data*, what are the actual and preferred relations to your chief, in formulating such interpretations and conclusions?

If question does not apply to you, check and omit..... ☐

Check whether the person more likely to be involved in this is:

your chief ☐1 other person ☐2 neither; omit ☐0

	Column A <i>Actually</i> occurs (rank)	Column B <i>Prefer</i> to see done (rank)
a. The chief gives considerable weight to my own opinions when he formulates the interpretations and conclusions (or tentative conclusions for someone higher up)	42_____	46_____
b. The chief himself formulates the interpretations and conclusions (tentative or final)	43_____	47_____
c. The chief talks it over with me (and perhaps with other people working on similar problems), and we jointly formulate the interpretations and conclusions (tentative or final)	44_____	48_____
d. The interpretations and conclusions (tentative or final) are up to me or my staff; the chief simply gives routine approval.	45_____	49_____

Add here any other comments you wish about the chiefs you work under, or about your working relations with them:

26. To what extent do you feel *personally concerned* about the above question (the amount of influence which investigators have had in allocating Clinical Center resources)? How *important* do you feel this matter is?

(check one)

↓ 51

- This matter is of extreme importance; I am very much concerned about it ☐ 1
- This matter is fairly important, and I am somewhat concerned about it ☐ 2
- The matter is of relatively little importance; I am more concerned about other matters ☐ 3
- No opinion ☐ y

27. How *satisfied* are you personally with the amount of influence or voice which responsible investigators in general have had, in determining the way Clinical Center resources are to be allocated within your Institute?

(check one)

↓ 52

- I am very satisfied with the amount of influence or voice the investigators have had ☐ 1
- I am fairly well satisfied ☐ 2
- I am somewhat dissatisfied ☐ 3
- I am very dissatisfied with the amount of influence they have had ☐ 4
- I don't care much one way or the other ☐ y

28. The Clinical Center will, of course, provide for a large program of clinical research—as contrasted with the basic or non-clinical research activities now going on in most of the Institutes' Laboratories.

In your opinion, is the *basic (non-clinical) research program of NIH likely to benefit or to suffer* as a result of the clinical research program? (Please make an estimate, even if you are not sure.)

(check one)

↓ 53

- The basic research program:
- Is likely to suffer substantially as a result of the clinical research program ☐ 1
- Is somewhat more likely to suffer than benefit, on the whole ☐ 2
- Is about equally likely to benefit or suffer ☐ 3
- Is somewhat more likely to benefit, on the whole ☐ 4
- Is likely to benefit substantially as a result of the clinical research program ☐ 5

Note: Additional questions on the Clinical Center will be asked in Part Two.

Comments on Clinical Center planning:

Clinical Center planning in your Institute

25. Consider the responsible investigators in your Institute as a whole—all of the scientists actively engaged in their own research, but below the level of Laboratory or Branch chief. In general, how much *influence or voice* have these scientists had in determining the way Clinical Center resources available to your Institute will be *allocated to the various activities carried out within your Institute*?

(check one)

↓ 50

- The responsible investigators have had considerable influence in determining the way our Clinical Center resources are to be allocated ☐ 1
- Moderate influence ☐ 2
- Little influence ☐ 3
- No influence at all ☐ 4
- I have no idea how much influence they have had ☐ y

* * *

Please answer the next eight questions (on this page and following page) for the *same persons you listed previously*, in question 9:

- (a) your chief (head of your administrative unit)
- (b) the person above your chief
- (c) other person you report to (if any)
- (d) the colleague you selected at your own level, under your chief
- (e) the professional you selected (if any) at GS-12 or Full Grade or higher, working under you
- (f) the professional you selected (if any) at GS-9 or 11, or Assistant or Senior Assistant Grade, working under you
- (g) the professional you selected (if any) at GS-9 or higher, or Assistant Grade or higher, working *below any of the people under you*.

Card 09

29. How often have you discussed with each of the following people the way the *various resources of the Clinical Center* (facilities, space, etc.) are to be *allotted for various purposes*? Please try to estimate how often, even though you are not sure.

(check one box for each person)

- | | Many
times | A
few
times | Once
or
twice | Never | Don't
recall |
|--------------------------|---------------|-------------------|---------------------|-------|-----------------|
| (a) chief | 11→□1 | □2 | □3 | □4 | □y |
| (b) person above chief.. | 12→□1 | □2 | □3 | □4 | □y |
| (c) other | 13→□1 | □2 | □3 | □4 | □y |
| (d) colleague | 14→□1 | □2 | □3 | □4 | □y |
| (e) | 15→□1 | □2 | □3 | □4 | □y |
| (f) | 16→□1 | □2 | □3 | □4 | □y |
| (g) | 17→□1 | □2 | □3 | □4 | □y |

30. Have you ever discussed specifically with each person the *amount of influence* which responsible investigators have had in determining the way Clinical Center resources are to be utilized by your Institute?

(check one box for each person)

- | | Sev-
eral
times | Once
or
twice | Never | Don't
Recall |
|--------------------------|-----------------------|---------------------|-------|-----------------|
| (a) chief..... | 18→□2 | □3 | □4 | □y |
| (b) person above chief.. | 19→□2 | □3 | □4 | □y |
| (c) other | 20→□2 | □3 | □4 | □y |
| (d) colleague | 21→□2 | □3 | □4 | □y |
| (e) | 22→□2 | □3 | □4 | □y |
| (f) | 23→□2 | □3 | □4 | □y |
| (g) | 24→□2 | □3 | □4 | □y |

31. To what extent do you feel that this person is *familiar with the everyday aspects of your job*? Does he know the usual kind of problems you face from day to day?

(check one box for each person)

- | | Thorough
familiarity | Some
familiarity | Little
familiarity | No
familiarity | Have
no
idea |
|--------------------------|-------------------------|---------------------|-----------------------|-------------------|--------------------|
| (a) your chief | 25→□1 | □2 | □3 | □4 | □y |
| (b) person above chief.. | 26→□1 | □2 | □3 | □4 | □y |
| (c) other | 27→□1 | □2 | □3 | □4 | □y |
| (d) colleague | 28→□1 | □2 | □3 | □4 | □y |
| (e) | 29→□1 | □2 | □3 | □4 | □y |
| (f) | 30→□1 | □2 | □3 | □4 | □y |
| (g) | 31→□1 | □2 | □3 | □4 | □y |

32. In question 25 we asked you how much *influence or voice* the responsible investigators have had in determining the allotment of Clinical Center resources. Now, how do you think each of these people would answer the *same question*? (Make an estimate, even if you are not sure; and of course do not ask the person.)

(check one box for each person)

This person probably thinks that the responsible investigators have had:

- | | Considerable
influence | Moderate
influence | Little
influence | No
influence
at all | He prob-
ably
has no
idea |
|--------------------------|---------------------------|-----------------------|---------------------|---------------------------|------------------------------------|
| (a) your chief | 32→□1 | □2 | □3 | □4 | □y |
| (b) person above chief.. | 33→□1 | □2 | □3 | □4 | □y |
| (c) other | 34→□1 | □2 | □3 | □4 | □y |
| (d) colleague | 35→□1 | □2 | □3 | □4 | □y |
| (e) | 36→□1 | □2 | □3 | □4 | □y |
| (f) | 37→□1 | □2 | □3 | □4 | □y |
| (g) | 38→□1 | □2 | □3 | □4 | □y |

33. In question 27 we asked you how *satisfied* you are with the amount of influence or voice which responsible investigators have had in these decisions. How do you think each of the following persons would answer the *same question*? (Make an estimate, even if you are not sure.)

(check one box for each person)

	Is very satis- fied	Is fair- ly well satis- fied	Is some- what dis- satis- fied	Is very dissat- isfied	He prob- ably doesn't care
(a) your chief	39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(b) person above chief..	40→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(c) other	41→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(d) colleague	42→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(e)	43→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(f)	44→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
(g)	45→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y

34. In question 28 we asked you if you think the *basic research program of NIH is likely to benefit or suffer* as a result of the clinical research program. How do you think each of these people would answer this question? (Make an estimate, even if you are not sure how the person would answer.)

(check one box for each person)

This person probably feels that basic research is:

	Likely to suffer substan- tially	Somewhat more likely to suffer	Equally likely to benefit or suffer	Somewhat more likely to benefit	Likely to benefit substan- tially
(a)	46→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(b)	47→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(c)	48→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(d)	49→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(e)	50→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(f)	51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(g)	52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Professional persons working under you

Card 10
Cols. 11-31 blank

In the next eight questions we shall consider relations between you and *any professional persons who work under you*. By this we mean either professionals who are administratively located under you, or those who report to you in some *other* regular or recognized capacity.

If there are no professional persons working under you in either sense, check here and skip the following eight questions, 35-42 ☐

We shall be interested here only in those professionals who work directly under *you*, and not under one of your subordinates.

35. Your relations with these professionals may vary considerably from person to person, depending on their qualifications or interests. Some may work *more on their own*; others may work *more under your guidance*. In the subsequent questions, you may wish to describe different working relations with each type. Therefore, please list below the names of up to five professionals directly under you, who tend to work (A) *more on their own* (if any):

_____ 32- _____
 _____ 36- _____
 _____ 40- _____
 _____ 44- _____
 _____ 48- _____

And please list below the names of up to five professionals directly under you, who tend to work (B) *more under your guidance* (if any):

_____ 52- _____
 _____ 56- _____
 _____ 60- _____
 _____ 64- _____
 _____ 68- _____

(If the professionals under you are fairly uniform in this respect, list up to five names under *one* of the two headings—whichever is more appropriate.)

* * * *

In the first four questions below, you are asked to *rank*, as objectively as you can, what your most typical or frequent methods *actually are*, in working with each group of professionals whom you named above. (Try not to answer merely as you would prefer to act.) Select the answer which is closest to your most typical method, and number this "1"; number "2" your next most typical method, and so on. Omit any method which you never use.

Card 11

36. What methods do you use (if any) to develop and maintain a *high level of work interest and involvement* in the professional personnel directly under you?

Please give a separate ranking for each of the two groups (A and B) whom you named previously. Number "1" your most typical or frequent method, "2" the next most typical, and so on; omit any you never use with that group.

Methods I actually use with professionals under me who work:

	A. More on their own (rank)	B. More under my guidance (rank)
a. I try to relieve them of any demands or routine duties which would tend to dampen their natural work interest	11_____	15_____
b. I try to make my own work interest and involvement as "contagious" as possible; try to stimulate them with a personal example of high interest	12_____	16_____
c. I try to get them to develop their own interests; try to get them involved in their own stimulating problems, so that they run "on their own steam"	13_____	17_____
d. I try to leave them alone as much as possible in every way	14_____	18_____
If there are no professionals of one type under you, check here and omit that ranking	<input type="checkbox"/> 0	<input type="checkbox"/> 0

37. What are the relations between you and the professionals directly under you, in determining concrete *work problems or assignments* or follow-up steps which they will work on next?*

Methods I actually use with professionals under me who work:

	A. More on their own (rank)	B. More under my guidance (rank)
a. I talk the work over thoroughly with each one, and give considerable weight to his views when I make the decisions (or recommendations to higher-ups)	19_____	23_____
b. I examine the work to date, and by myself I make whatever decisions or recommendations I feel are best	20_____	24_____
c. I talk it over with each one (and perhaps with other people working on similar problems), and we jointly formulate the decisions or recommendations	21_____	25_____
d. Such decisions or recommendations are up to each of these persons (or his own staff); I simply give routine approval ..	22_____	26_____

Please check any box and omit the ranking(s) if:

—No professional of this type under me ☐0 ☐0
—I am not involved at all in these matters .. ☐9 ☐9

*37a. If their work seldom requires a decision as to new assignments, you may answer an alternative question: How are decisions made about *general policies governing their work procedures*?

If so answering, check here 27☐1

38. Suppose one of the professionals under you wanted to spend a considerable sum for an extra item not previously provided for. How do you usually go about arriving at a decision on such a *substantial new expenditure* out of current funds?

	A. More on their own (rank)	B. More under my guidance (rank)
Methods I actually use:		
a. I talk the matter over with him thoroughly, and give considerable weight to his views in making the decision (or recommendation to higher-ups)	28_____	32_____
b. I make by myself whatever decision or recommendation I feel is best	29_____	33_____
c. I consult with him (and perhaps other people at his level), and we jointly formulate the decision or recommendation ..	30_____	34_____
d. Each one has already received an allotment to cover such new expenditures, and he makes the decision (or recommendation) within this allotment; I simply give routine approval	31_____	35_____

Please check any box and omit the ranking(s) if:

—No professional of this type under me ☐0 ☐0
—They are not likely to request funds ☐8 ☐8
—I am not involved at all in these matters ☐9 ☐9

39. What are the relations between you and the persons under you, in formulating *interpretations and conclusions*, based on data to which *their work has contributed*?

	A. More on their own (rank)	B. More under my guidance (rank)
Methods I actually use:		
a. I give considerable weight to their opinions when I formulate the interpretations and conclusions (or tentative conclusions for someone higher up)	36_____	40_____
b. I formulate the interpretations and conclusions myself (tentative or final)	37_____	41_____
c. I talk it over with them (and perhaps with other people working on similar problems), and we jointly formulate the interpretations and conclusions (tentative or final)	38_____	42_____
d. The interpretations and conclusions (tentative or final) are up to them or their staff; I simply give routine approval ...	39_____	43_____

Please check any box and omit the ranking(s) if:

—No professional of this type under me ☐0 ☐0
—Question does not apply to their work ☐8 ☐8
—I am not involved at all in these matters ☐9 ☐9

Card 11

In the remaining three questions, you are asked to estimate what methods you believe *these persons would prefer* you to use. Please make a rough estimate, even though you are not sure.

Number "1" the method which you think each group would probably prefer most; number "2" the method each would probably prefer next, and so on. Rank *all* the items, including those you do not use.

40. What is your best estimate of how the professionals directly under you would *prefer* to see decisions made about *work problems or assignments*?*

These persons would probably prefer:	A. More on their own (rank) ↓	B. More under my guidance (rank) ↓
a. That I talk the work over thoroughly with them, and that I give considerable weight to their views when I make the decisions (or recommendations to higher-ups)	44_____	48_____
b. That I examine the work to date, and that by myself I make whatever decisions or recommendations I feel are best	45_____	49_____
c. That I talk it over with them (and perhaps with other people working on similar problems), and that we jointly formulate the decisions or recommendations	46_____	50_____
d. That such decisions or recommendations be left up to them (or their staffs); that I simply give routine approval	47_____	51_____
Check and omit ranking if no professional of this type under you	<input type="checkbox"/> 0	<input type="checkbox"/> 0

*40a. If you chose to answer alternative question 37a, answer the corresponding alternative here: how would these persons probably *prefer* to see decisions made about *general policies governing their work procedures*?

41. Now, what is your best estimate of how the professionals working directly under you would prefer to see decisions made about *substantial new expenditures* for extra items?

These persons would probably prefer:	A. More on their own (rank) ↓	B. More under my guidance (rank) ↓
a. That I talk the matter over with them thoroughly, and give considerable weight to their views in making the decisions (or recommendations to higher-ups)	52_____	56_____
b. That I make by myself whatever decisions or recommendations I feel are best	53_____	57_____
c. That I consult with them (and perhaps with other people at their level, and that we jointly formulate the decisions or recommendations	54_____	58_____
d. That they receive an allotment to cover such new expenditures, and make their decisions (or recommendations) within this allotment; that I simply give routine approval	55_____	59_____
Check and omit ranking if no professional of this type under you	<input type="checkbox"/> 0	<input type="checkbox"/> 0

42. What is your best estimate of how the professionals directly under you would prefer to see *interpretations and conclusions* formulated, where *their work has contributed* to the data?

These persons would probably prefer:	A. More on their own (rank) ↓	B. More under my guidance (rank) ↓
a. That I give considerable weight to their opinions when I formulate the interpretations and conclusions (or the tentative conclusions for someone higher up)	60_____	64_____
b. That I formulate the interpretations and conclusions myself (tentative or final)	61_____	65_____
c. That I talk it over with them (and perhaps with other people working on similar problems), and that we jointly formulate the interpretations and conclusions (tentative or final)	62_____	66_____
d. That the interpretations and conclusions (tentative or final) be left up to them or their staff; that I simply give routine approval	63_____	67_____

Check any box and omit the ranking(s) if:

—No professional of this type under me	<input type="checkbox"/> 0	<input type="checkbox"/> 0
—Question does not apply to their work	<input type="checkbox"/> 8	<input type="checkbox"/> 8
—I am not involved at all in these matters	<input type="checkbox"/> 9	<input type="checkbox"/> 9

Add any other comments you wish on your working relationships with the people under you—*either professionals or non-professionals*:

PART TWO: YOUR JOB AND CONDITIONS IN THE WORKING ENVIRONMENT

Specific conditions in the working environment

43. What has been your personal experience with various conditions in your working environment? How satisfied are you with these conditions? (Please indicate in Column A.) How have they changed, if at all, since you have been with NIH? (Please indicate in Column B.)

Column A

In your personal experience, how satisfied are you with the following conditions as they affect you personally?

(Check one box in each line)

	Very well satisfied	Fairly well satisfied	Neutral or mixed feelings	Dis-satisfied	No opinion
Chances for promotion in the organization . . .	11→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Security: relative permanence of job (assuming I do job well)	13→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Salary	15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Caliber of scientific and other professional personnel	17→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Quality of scientific and other professional leadership	19→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Reputation of NIH in scientific world	21→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Physical facilities (equipment, supplies, etc) . .	23→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Space (at the present time)	25→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Assisting and supporting personnel (lab technicians, secretaries, etc.)	27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Attention to general health of personnel	29→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Attention to safety of personnel on the job . .	31→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Restaurant and food facilities	33→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y
Convenience of NIH location to my present residence	35→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y

Please add any specific comments you wish about these or other conditions in the working environment at NIH:

Column B

Card 12

In terms of your total experience at NIH, are these conditions better or worse at the present time than they were before?

(Check one box in each line)

Much better now	A little better now	About the same	Worse now	No experience or opin.
12→□1	□2	□3	□4	□y
14→□1	□2	□3	□4	□y
16→□1	□2	□3	□4	□y
18→□1	□2	□3	□4	□y
20→□1	□2	□3	□4	□y
22→□1	□2	□3	□4	□y
24→□1	□2	□3	□4	□y
26→□1	□2	□3	□4	□y
28→□1	□2	□3	□4	□y
30→□1	□2	□3	□4	□y
32→□1	□2	□3	□4	□y
34→□1	□2	□3	□4	□y
36→□1	□2	□3	□4	□y

Auxiliary services

44. Doing scientific or other professional work at NIH requires many auxiliary services, some of which are listed below (this is not a complete list). We would like to know your own experience concerning the adequacy of these service functions.

In Column A below, please indicate whether your own experience with each service listed has been mainly with personnel in the Central Administration or with personnel in your own Institute, or equally with both (or perhaps you have had no experience with either).

In Column B below, indicate your overall impression of the adequacy of service provided by the personnel you checked in Column A.

In Column C you may indicate the main reason or reasons for the adequacy or inadequacy you checked in Column B. If a certain service is "generally adequate", is this because of adequate *speed*, or adequate *quality* (meets your requirements), or adequate *quantity*? And again, if a certain service is "often inadequate", is this due to *lack* of speed, or of quality, or of quantity? Check any of these reasons which apply (or none).

	Column A My experience has been <i>mainly</i> with the following: (Check one in each line)				Column B Adequacy of services provided by personnel checked in A (Check one in each line)			Column C Reasons for adequacy or inadequacy (Check <i>any</i> which apply, or none, in each line)		
	Central personnel	Pers. in my Institute	Equally with both	Little experience with either	Generally adequate	Often inadequate	No opinion or experience	Speed	Quality	Quantity
Glassware cleaning and supplies	37→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	38→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	39→ <input type="checkbox"/>	40 <input type="checkbox"/>	41 <input type="checkbox"/>
Getting other supplies from store room	42→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	43→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	44→ <input type="checkbox"/>	45 <input type="checkbox"/>	46 <input type="checkbox"/>
Requisitioning supplies and equipment from outside	47→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	48→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	49→ <input type="checkbox"/>	50 <input type="checkbox"/>	51 <input type="checkbox"/>
Laboratory animals	52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	53→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	54→ <input type="checkbox"/>	55 <input type="checkbox"/>	56 <input type="checkbox"/>
Scientific instruments and glass-blowing: fabrication, repair	57→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	58→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	59→ <input type="checkbox"/>	60 <input type="checkbox"/>	61 <input type="checkbox"/>
Routine maintenance and repair of facilities: plumbing, air conditioning, lights, etc.	62→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	63→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	64→ <input type="checkbox"/>	65 <input type="checkbox"/>	66 <input type="checkbox"/>
Card 13										
Shop work: carpentry, metal, etc.	11→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	12→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	13→ <input type="checkbox"/>	14 <input type="checkbox"/>	15 <input type="checkbox"/>
Photographic service	16→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	17→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	18→ <input type="checkbox"/>	19 <input type="checkbox"/>	20 <input type="checkbox"/>
Library facilities and service	21→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	23→ <input type="checkbox"/>	24 <input type="checkbox"/>	25 <input type="checkbox"/>
Translating service	26→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	28→ <input type="checkbox"/>	29 <input type="checkbox"/>	30 <input type="checkbox"/>
Secretarial and typing service	31→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	32→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	33→ <input type="checkbox"/>	34 <input type="checkbox"/>	35 <input type="checkbox"/>
Job classification service	36→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	37→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	38→ <input type="checkbox"/>	39 <input type="checkbox"/>	40 <input type="checkbox"/>
Recruitment and hiring, particularly at the non-professional level	41→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	42→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	43→ <input type="checkbox"/>	44 <input type="checkbox"/>	45 <input type="checkbox"/>
Payroll and travel voucher service	46→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	47→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> y	48→ <input type="checkbox"/>	49 <input type="checkbox"/>	50 <input type="checkbox"/>

45. In general, *how do you go about obtaining auxiliary services* of the kinds listed above, either within your own Institute or from the Central Administration? How do you make arrangements with the person in charge of each service?

Of the methods listed below, indicate which one, or two, or three you use often. Please pick out the method which you use *most* often, and number this "1". If there is a second method you use often, you may number this "2". If there is a third method you use fairly often, you may number this "3".

	Services within my own Insti- tute ↓	Central ser- vices ↓
I contact the service either <i>personally</i> or by <i>phone</i> (or one of my subordinates does so) ..	51_____	56_____
I send a <i>memo</i> or <i>requisition</i> (or one of my subordinates does so) ..	52_____	57_____
I tell my <i>chief</i> , and he puts in a request for the service ..	53_____	58_____
I contact my <i>Institute Administrative Office</i> <i>personally</i> or by <i>phone</i> (or one of my subordinates contacts them), and they request the service ..	54_____	59_____
I send a <i>memo</i> or <i>requisition</i> to our Institute Administrative Office (or one of my subordinates does so) ..	55_____	60_____
If you have little to do with requesting auxiliary services, check the box or boxes and omit either column ..	<input type="checkbox"/> 0	<input type="checkbox"/> 0

Add any comments you wish on these or other auxiliary services:

46. In scientific or other professional papers about work to which you have made some contribution, is *proper credit given to your own contribution*, by means of authorship or acknowledgment?

(check one)

- ↓ 11
- Proper credit is always given me in proportion to the amount of my contribution ☐1
- Proper credit is usually given me ☐2
- Credit is sometimes given; sometimes not given, or given inadequately ☐3
- My contributions are seldom given proper credit in these papers ☐4
- No opinion ☐y
- I seldom do work which contributes directly to a professional paper ☐0

47. In your opinion, what would be a desirable policy for NIH to adopt in regard to *working hours for scientists and other professionals* at your own level? (Please answer without regard to existing NIH or government policies.)

(check one)

- ↓ 12
- Regular working hours should be set (as, 8:30 to 5), and professional personnel at my level should be expected to work at least these hours, within reasonable limits ☐1
- Regular working hours should be set (as, 8:30 to 5), but a professional person at my level should be allowed to arrange a different work schedule by agreement with his chief ☐2
- No regular hours should be set for professional personnel at my level, but they should be expected to put in at least forty hours a week, at whatever hours they feel are required by their work ☐3
- No regular working hours or work week should be set for professional personnel at my level ☐4
- No opinion ☐y

48. Suppose you were to move to some place other than NIH. If you had your choice, which of the following types of situations would you *most prefer* to be in? (Assume that conditions there would be as good as you could expect in the best of such situations.)

Indicate your *first choice* (your highest preference) in Column A, your *next choice* in Column B.

	A. First choice (check one) ↓ 13	B. Next choice (check one) ↓ 14
Other US Public Health Service organization	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Other government organization	<input type="checkbox"/> 2	<input type="checkbox"/> 2
University	<input type="checkbox"/> 3	<input type="checkbox"/> 3
Private practice or my own business	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Industrial organization	<input type="checkbox"/> 5	<input type="checkbox"/> 5
Other situation: _____	<input type="checkbox"/> 6	<input type="checkbox"/> 6

Time spent on different job activities

49. In a typical work week, how much time do you usually spend altogether on your job and on activities related to your job? And how is this total time broken up (roughly) among your various activities?

Naturally, these figures will vary from week to week, and it may be difficult to recall. Just give your best estimate, even though it is a rough approximation.

In your estimate, *include* time of the following sort:

- time spent at home or elsewhere on job activities;
- any meal time which is devoted to job or job-related activities;
- time you spend in travel during working hours;
- if you spend time in outside meetings or visits, include that portion of the time which is devoted to work or work-related activities.

Despite its importance, do *not* include the "mulling over" that often goes on throughout leisure hours.

Some of these activities may not occur every week. For example, you may spend four hours each month on a certain committee. Count this time as if it were spread throughout the month: one hour each week.

Activity	Examples	Approximate hours in typical week (to nearest hour) ↓
a. Work of a <i>scientific or other professional nature</i> , where I work largely by <i>myself</i> (or supervise the work of assistants):		
—performing my own professional work (or work under the guidance of my chief)	(Such as research, professional practice, professional writing, etc.)	_____ [15_____]
—performing professional services requested by other persons	(Such as analysis, synthesis, consultation, etc., where requested by others)	_____ [16_____]
—reading, attending seminars and professional meetings, to keep informed on current developments		_____ [17_____]
b. Work of a professional nature, where I work <i>with close professional associates</i> (either colleagues or subordinates)	(Discussions about my work or theirs; reading their reports; guiding professional work of subordinates; also, our journal club or discussions covering current literature)	_____ [18_____]
c. Activities bearing on professional matters, involving people <i>other</i> than my close associates	(Such as committee work, inside or outside NIH, dealing with professional publication, grants and fellowships, seminar planning, etc.)	_____ [19_____]
d. <i>Administrative matters</i> , where I work largely by <i>myself</i> (or supervise work of assistants)	(Planning, record-keeping, telephoning, correspondence on matters of finance, personnel, facilities, etc.)	_____ [20_____]
e. Administrative matters where I work <i>with close professional associates</i> (either colleagues or subordinates)	(Discussing our needs for facilities or services; discussing matters of finance, personnel, etc. with them.)	_____ [21_____]
f. Activities bearing on administrative matters (or public relations matters), involving people <i>other</i> than my close associates	(Such as committee work to handle matters of facilities, finance, personnel; seeing visitors, appearing before lay groups, etc.)	_____ [22_____]
g. Activities which fit none of the above categories (specify) _____		_____ [23_____]
h. Miscellaneous time spent during working hours	(Time spent in transit during working hours, in conversation unrelated to the job, in delays while waiting for services or supplies, etc.)	_____ [24_____]
In a typical work week, my time on the job and on job-related activities is approximately this <i>total</i> :		_____ [25_____]

Important factors in your job

50. Listed below are a number of items which may contribute to your satisfaction in your work. To what extent does your present job *actually provide* each of these? (Please indicate in Column A.) Which of these are *most important to you personally*; that is, which aspects do you most *want* to have in a job? (Please indicate in Column B.)

	Column A To what extent does your present job actually provide this? (check one in each line)				Column B How much do you <i>want</i> each aspect? How <i>important</i> is each one to you? (check one in each line)			
	To the fullest extent	To con- sider- able ex- tent	To some or lit- tle ex- tent	No opin- ion	Of utmost import- ance	Of con- sider- able im- portance	Some or little import- ance	No opin- ion
Sense of belonging to an organization which has prestige in the scientific world	26→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Sense of belonging to an organization which has prestige in the lay community	28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	29→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Chance to use my present abilities or knowledge	30→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	31→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Chance to acquire new abilities or knowledge	32→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	33→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Freedom to carry out my own ideas; chance for originality and initiative	34→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	35→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Having an important job in the organization	36→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	37→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Contributing to the nation's health	38→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	39→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Contributing to basic scientific knowledge ...	40→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	41→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Association with high-level persons having important responsibilities.	42→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	43→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y

The "pace" of your job

51. Some jobs are relatively "high-paced", for any of several reasons. That is, the person finds himself working at high speed or pressure or effort nearly all of his working hours, with hardly any let-up in pace. Other jobs are more moderately paced, with frequent let-ups in speed or pressure or effort. Regardless of the reason, *at what pace do you normally find yourself working* in your job?

During the time I spend on my job and related activities, I normally find myself working:	(check one) ↓ 44
At a maximum pace almost the whole time; seldom any let-up	<input type="checkbox"/> 1
At a maximum pace most of the time; occasional let-ups ..	<input type="checkbox"/> 2
At a maximum pace a majority of the time, but with moderately paced let-ups fairly often	<input type="checkbox"/> 3
At a moderate pace a majority of the time	<input type="checkbox"/> 4
At low pace a majority of the time	<input type="checkbox"/> 5
Cannot make any estimate for my job	<input type="checkbox"/> y

52. There may be several reasons for the pace at which you work. Which of the factors listed below has the *most to do with setting the pace* of your own job?

Please check in Column A the factor which has *most* effect on setting your pace; check in Column B the factor which has the *next* most effect on your pace.

	A. Most effect (check one) ↓ 45	B. Next effect (check one) ↓ 46
What the job itself (the nature of the work) requires of me	<input type="checkbox"/> 1	<input type="checkbox"/> 1
What my chief (or chiefs) expect of me	<input type="checkbox"/> 2	<input type="checkbox"/> 2
What my group of close professional associates expect of me	<input type="checkbox"/> 3	<input type="checkbox"/> 3
What the people under me expect of me	<input type="checkbox"/> 4	<input type="checkbox"/> 4
What I expect of myself	<input type="checkbox"/> 5	<input type="checkbox"/> 5

Job interest

53. The different job activities listed above may vary in the *interest and involvement* they arouse in you. How much interest and involvement do you feel (if any) in each of these activities?

(The following activities have the same meaning as in question 49):

(Check one box in each line)

	Intense interest	Strong interest	Moderate or mild interest	Disinterest or dissat- isfaction	No opinion	Don't do this in my job
a. Professional work, done largely by myself:						
—performing my own work	47→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
—performing professional services requested by others ..	48→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
b. Professional work, where I work with close professional associates	49→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
c. Activities bearing on professional matters, involving persons other than the above	50→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
d. Administrative matters, working largely by myself	51→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
e. Administrative matters, where I work with my close professional associates	52→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
f. Activities bearing on administrative matters (or public relations matters), involving persons other than the above	53→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0
g. Any other activities named in question 49	54→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> y	<input type="checkbox"/> 0

54. Roughly, how much time per week are you now spending on *activities which could be shifted to other people or eliminated* without impairing your present scientific or other professional work?

Roughly _____ hours per week [55 _____]

Approximately how would you break down this amount of time (if any) into the following three activities?

a. Activities which could be handled by *other professionally trained persons*:

Roughly _____ hours per week [56 _____]

b. Activities which could be handled by *administrative or technical personnel* or by assistants *below the professional level*:

Roughly _____ hours per week [57 _____]

c. Activities which could be *eliminated altogether*:

Roughly _____ hours per week [58 _____]

Add any comments you wish on your job and job activities.

Facilities for professional information

55. What *sources* do you rely on most for scientific or professional information *in your own field or discipline* (both inside and outside of NIH)?

How important to you is each one of the sources listed below? (Please indicate in Column A.)

For which of the following would you like to see more facilities or means available than now (or less)? (Please indicate in Column B.)

	Column A Importance of each source to me at present: (check one box in each line)				Column B I would like to see the facilities or means for these sources: (check one box in each line)			
	Very important	Fairly important	Not very important	Hard to say	Made larger	Kept the same	Made smaller	No opinion
Hearing papers presented at NIH or Institute seminars	11→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	12→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Hearing papers presented at outside professional meetings	13→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	14→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Participating in journal clubs and other small groups where current literature is covered	15→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	16→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Personal contacts with individuals at NIH	17→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	18→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Personal contacts with individuals outside NIH; people I meet at professional meetings, etc.	19→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	20→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Newsletters, memos, etc.	21→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	22→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Reading books, journals and reprints that I keep in my working library, or those obtained from colleagues	23→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	24→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Reading books, journals and reprints I obtain from the central NIH library	25→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	26→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Other (specify):	27→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	28→ <input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y

56. How do you feel about the *amount and type of information* you receive on scientific and other professional activities *elsewhere in NIH* (outside your own group)?

Please check *any* of the following answers which apply. (check any)

↓

Do not have enough chance to exchange views and experiences with other people in my *own* field, discipline, or problem area 29 ☐

Not receiving enough information about NIH activities in *other* fields, disciplines, or areas 30 ☐

Many NIH or Institute seminars not informative enough to justify the time spent 31 ☐

On the whole, I find the NIH or Institute seminars interesting and profitable 32 ☐

I would like to know more about whom to see for certain types of professional information if I should need it 33 ☐

I know fairly well whom to see for whatever professional information I need. 34 ☐

57. How do you personally feel about the provisions for *travel to professional meetings*, both in terms of the basic policies and in terms of the way these policies have been applied in practice?

(check one)

↓ 35

The travel policies are reasonably sound in principle and are satisfactory in practice ☐1

The policies are reasonably sound, but occasionally arbitrary or inflexible in practice ☐2

The policies are reasonably sound, but frequently arbitrary or inflexible in practice ☐3

The policies themselves are relatively unsatisfactory ☐4

No opinion ☐y

I do not know what the policies are ☐0

Add any other comments you wish on facilities for transmitting professional information:

Promotions and careers

58. Have you observed cases where two or more people are doing work at the *same level of competence and responsibility* but in *different grades or ranks*?*

- (check one)
↓ 36
- I have observed frequent discrepancies of this sort ☐1
- I have observed occasional discrepancies ☐2
- I have seldom or never observed discrepancies of this sort .. ☐3
- I have very little familiarity with this situation ☐0

*Such discrepancies might exist either if persons with different responsibilities were in the same grade, or if persons with similar responsibilities were in different grades.

59. If you have observed such discrepancies, where do most of them occur? (Check *any of the following* which apply.)

- (check any)
↓
- Within Civil Service 37 ☐
- Within Commissioned Corps 38 ☐
- Between Civil Service and Commissioned Corps 39 ☐
- Between my Institute and other Institutes 40 ☐
- Between NIH and other parts of PHS or FSA 41 ☐
- None of these; few or no discrepancies 42 ☐

60. How has the promotion process for scientists or other professionals worked out, in the experience of people you know personally?

Please answer both in terms of Civil Service and Commissioned Corps promotions, insofar as you are familiar with either.

We are interested not only in how well each system is functioning at present, but whether you have noticed any change in either one over the past few years.

- | This promotion process: | Civil Service promotions
(check one)
↓ 43 | Commissioned Corps promotions
(check one)
↓ 44 |
|--|---|--|
| Has been and continues to be reasonably satisfactory | <input type="checkbox"/> 1 | <input type="checkbox"/> 1 |
| Is much better now than it used to be; it is now reasonably satisfactory | <input type="checkbox"/> 2 | <input type="checkbox"/> 2 |
| Is better now than it used to be, but it should be improved further | <input type="checkbox"/> 3 | <input type="checkbox"/> 3 |
| Has been and continues to be relatively unsatisfactory | <input type="checkbox"/> 4 | <input type="checkbox"/> 4 |
| Is less satisfactory now than it used to be ... | <input type="checkbox"/> 5 | <input type="checkbox"/> 5 |
| No opinion, or no personal experience on which to judge | <input type="checkbox"/> y | <input type="checkbox"/> y |

61. In terms of your scientific or other professional career, how do you see NIH as fitting into your plans?

Please answer in terms of your *personal preference*, barring unforeseen contingencies; and also in terms of what you may reasonably expect NIH to provide in type of work, promotions, etc.

- Subject to the above qualifications: (check one)
↓ 45
- I would probably like to stay with NIH permanently ☐1
- I would like to stay here for the time being, but to move somewhere else eventually ☐2
- I would be willing to move somewhere else as soon as a more suitable opportunity arises ☐3
- No opinion ☐y

62. Would you be interested in a higher level job at NIH if it meant doing less of your present work and more of something else? For example, would you be interested in a higher level job which required spending a large part of your time on the activities below? (Or a larger part than you spend now?)

- (check one on each line)
- | A job which required a large (or larger) part of my time on: | Yes, interested | Possibly | No, not int'd | No opinion |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Professional leadership: stimulating or advising subordinate professionals about their work 46→ | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> y |
| Administrative planning or co-ordination: allocation of funds, recruitment of personnel, expediting of services, etc. 47→ | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> y |
| Public relations and appropriations: appearing before congressional committees, securing the support of outside groups, etc. 48→ | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> y |

Add any comments you wish about the promotion process and career opportunities at NIH:

Organizational changes at NIH

63. Over the past five years, many important changes have occurred at NIH and in the various Laboratories and Branches. The major change has, of course, been a rapid increase in size and in facilities. New Institutes, Laboratories, etc., have been started, and some existing groups have been expanded. In addition, there have been changes such as: re-combination of groups, additional supervisors, new activities, etc. These changes may have had both beneficial and harmful consequences.

To what extent have *you personally* been affected by such changes? (Please answer in Column A.)

How do you feel about the way you have been affected? (Please answer in Column B.) *Note:* Do not answer in terms of changes due to your own promotion or transfer, but only in terms of changes in the *situation around you*.

	Column A Do you now have more or less of the following items than before? (Check one box in each line)				Column B How do you feel about the change or lack of change? (Check one box in each line)				
	More now	About the same	Less now	No experience	Distinct improvement	Does not matter much	Distinct disadvantage	No opinion or no experience	
The voice I have in important matters which affect me 49→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	50→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Amount of time for my own scientific or other professional work 51→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	52→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Amount of time for discussion with other professionals working with me 53→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	54→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Freedom in selection of problems or assignments 55→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	56→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Ability to control the activities I am responsible for 57→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	58→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Extent of talking things over with my immediate chief 59→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	60→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Extent of talking things over with my Institute director (answer in terms of any change since this position was created) 61→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	62→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Extent of talking things over with the NIH Director or his immediate staff 63→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	64→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y
Information about other NIH work in my own field or problem area 65→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 0	66→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y

Add any other comments you wish on the way these organizational changes have affected you:

Changes due to the Clinical Center

Card 16

64. By the middle of next year the Clinical Center will be in operation. This will mean a number of organizational changes, such as many more people on the staff, an influx of clinically oriented doctors, a larger proportion of auxiliary personnel (nurses, dieticians, etc.), shifts in Laboratories to the Clinical Center, etc.

We would like your opinions about some specific changes that may occur. What are your personal opinions, your subjective feelings, whatever the facts may ultimately turn out to be?

The following expectations may be felt by some people. How would you personally feel about each one if it should happen in your own work situation? (Indicate in Column A.)

Do you think it is likely to happen in your own work situation? (Indicate in Column B.)

Possible changes:	Column A				Column B		
	If this were to happen in my own situation, I would tend to feel:				How likely is each change to happen in your situation?		
	(check one in each line)				(check one in each line)		
	Pleas- ed	Neu- tral	Wor- ried	No opin.; or doesn't apply	Likely to happen	Not likely to happen	Can't say; or doesn't apply
In my Institute, the work may tend to shift toward a substantial emphasis on applied as well as basic research11→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	12→	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> y
The growth in size may decrease the adequacy of services, communication, information, etc. we get ...13→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	14→	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> y
The clinical research programs may provide stimulating ideas and problems for our basic research programs15→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	16→	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> y
A shorter time may elapse between our basic medical discoveries and their application in clinical situations17→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	18→	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> y
People with clinical backgrounds may have considerably more weight in deciding scientific policies affecting my Institute19→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	20→	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> y
There may be less emphasis on extramural activities (research grants, etc.) in my Institute21→	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> y	22→	<input type="checkbox"/> 1	<input type="checkbox"/> 2 <input type="checkbox"/> y

Add if you wish other advantages or disadvantages of the Clinical Center which appear likely to you:

The survey itself

65. Finally, what comments would you like to make about this survey itself—the questionnaire, the procedures, or any other aspect?