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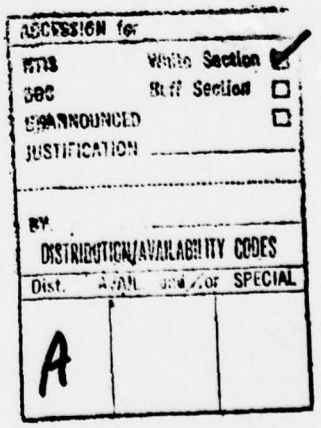
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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
(14) 1. REPORT NUMBER AFIT-LSSR-33-77B	2. GOVT ACCESSION NO. — 3. RECIPIENT'S CATALOG NUMBER
(6) 4. TITLE (and Subtitle) AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN TASK-GOAL CHARACTERISTICS AND PERCEIVED ORGANIZATIONAL LEVEL.	(9) 5. TYPE OF REPORT & PERIOD COVERED Master's Thesis; 6. PERFORMING ORG. REPORT NUMBER
(10) 7. AUTHOR(s) Gerald E. McNair, Captain, USAF; Anton J. Price, Captain, USAF	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Graduate Education Division, School of Systems and Logistics, Air Force Institute of Technology, WPAFB, OH	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Department of Research and Administrative Management, AFIT/LSGR, WPAFB, OH 45433	(11) 12. REPORT DATE Sept[illegible]977; 13. NUMBER OF PAGES 104 (12) 119 p.
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report) Unclassified; 15a. DECLASSIFICATION/ DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

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

Ø12 25Ø

18. SUPPLEMENTARY NOTES

APPROVED FOR PUBLIC RELEASE AFR 190-17.

JERRAL F. GUESS, CAPT, USAF
Director of Information

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

GOAL CHARACTERISTICS
ORGANIZATIONAL LEVEL
MANAGEMENT BY OBJECTIVES
GOALS
GOAL SETTING

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

Thesis Chairman: Dale R. McKemey, Major, USAF

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The research, using data collected from USAF Air Training Command members, explores relationships between task-goal characteristics and perceived organizational level. A comprehensive literature review points to the lack of empirical field testing in this area of goal setting theory. Methodology includes the development of goal and organizational level measurements, factor analysis of the questionnaire, and parametric and non-parametric correlational analyses. The research concludes that a positive relationship exists between perceived organizational level and goal setting participation. Across-the-board participation as advocated by many modern management theories may not be a viable concept. Task-goal specificity, feedback, and difficulty did not display significant relationships to organizational level. Results suggest that these characteristics receive equal emphasis by individuals at all organizational levels. Goal acceptance and commitment require improved measurement instruments before conclusions regarding the two goal characteristics can be reached. The innovative instrument developed for perceived level measurements proved effective and provides advantages over traditional measurement techniques for this organizational characteristic.

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AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN TASK-GOAL CHARACTERISTICS AND PERCEIVED ORGANIZATIONAL LEVEL

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics Management

By

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September 1977

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MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

DATE: 7 September 1977

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COMMITTEE CHAIRMAN

ACKNOWLEDGEMENTS

We wish to express our gratitude and appreciation to Major Dale R. McKemey, our thesis advisor. His guidance throughout this research effort kept us on target. We also thank Phyllis Reynolds, our typist, for taking that extra step to insure quality; her mark of professionalism.

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CHAPTER I

INTRODUCTION

Management by Objectives (MBO) (Drucker, 1954; Odiorne, 1964), a goal-oriented management concept, has gained widespread acceptance in private industry as well as government organizations. Numerous research studies have confirmed the importance of goals in regulating work motivation and performance and have spurred implementation of MBO programs.

The keystone upon which MBO is based is participative goal setting (Tosi, 1975b, p. 406). Participation is not limited to management levels as the concept's name may suggest; rather, it is extended through all organizational levels and involves managers, supervisors, and workers.

Because MBO programs are intended to develop goals through joint participation and facilitate direction of group efforts in achievement of those goals, the importance of goal quality cannot be overemphasized. Managers involved in MBO programs or similar goal-oriented management programs must, therefore, concern themselves with the quality of the goals developed within their organizations.

To effectively evaluate goal quality, a basic knowledge of goals and other organizational variables is

necessary. Extensive research has significantly broadened knowledge of goals and the relationships between goals and some organizational variables. There is, however a problem in that research concerning relationships between goals and other important organizational variables is incomplete.

Included in the organizational variables which may be related to goals and may have an impact on goal quality or effectiveness is a group of variables categorized as "organizational characteristics." One specific organizational characteristic which has received major attention in research other than that involving goals is "organizational level," a term referring to the position of individuals within organizations. Several leading researchers have strongly suggested that a relationship may exist between organizational level and the task-goal emphasis by individuals assigned at various levels (Porter & Lawler, 1965; Tosi, 1975b; Umstot, 1977). Specific research, however, has not been conducted to investigate possible relationships between organizational level and goal characteristics.

The problem for research is that there is a clear need to investigate the possible relationship of task-goal characteristics of individuals and their perceived organizational level.

Literature Review

The following discussion briefly reviews specific studies relevant to each of the key research variables.

Organizational Characteristics

Organizational characteristics are those structural, social, and operational variables of an organization which, along with other forces, influence the behavior of individuals in the organization. Commonly included are:

1. Organizational level
2. Line and staff hierarchies
3. Span of control
4. Size: subunits
5. Size: total organization
6. Shape: tall or flat
7. Shape: centralized or decentralized

(Porter & Lawler, 1965, p. 24).

Through research dealing with each of these organizational characteristics, our understanding of specific areas of human behavior in organizational settings has been gradually expanded. The single organizational characteristic of the current research effort, organizational level, has been the subject of numerous other research efforts in areas other than that regarding goal phenomena.

Review of research involving organizational levels discloses one very clear point--there is no universally

accepted measurement for organizational level. Level has been considered in several different respects by behavioral researchers and various methods have been used to measure the variable. Researchers have attempted to measure level in such terms as upper-level, middle-level, and lower-level management; blue-collar and white-collar positions; technical and administrative functions; and manager and worker positions.

There have been a few research efforts in which attempts to use more realistic methods for operationalizing level were made. Adams, Laker, and Hulin (1977) attempted to use a twenty-point scale on which they identified each point in terms of job level. Definition of job level was accomplished through ratings made by the investigators and was based on training time or educational requirements, responsibility, and authority inherent in the job. "Because of the small numbers of workers within these separate job levels, the actual job level hierarchy was trichotomized [Adams, Laker, & Hulin, 1977, p. 137]." The trichotomy used as the actual measurement was ". . . Job Levels 1-6 (unskilled), 7-11 (skilled), and 12-20 (professional/supervisory) [Adams, Laker, & Hulin, 1977, p. 337]." Thus, the research ultimately reverted to the more common form of measurement on an ordinal scale.

Combining traditional measurement concepts with a concept involving perception of employees, Porter (1963)

operationalized level in a somewhat unique way. For vertical levels of the organizations used in his research, Porter used respondent self-classification of positions to categorize jobs in one of four levels; vice-president, upper mid[illegible], lower middle, and lower.

[illegible]us measurement associated with the management [illegible]ncept has been the most generally accepted method used by researchers. This type of measurement has been employed in studies which have produced much of the modern management theory such as that forwarded by Argyris (1957) and McGregor (1960). Although level has been treated as a simple dichotomy in the majority of investigations, common sense and evidence easily found in organizations suggest that it is seldom considered as a simple dichotomy in the business environment. Charts displaying the functional or administrative structure of the organization are typically found in formal organizations. Whether the charts indicate a line-and-staff structure, a chain of command, a pyramid of the management hierarchy, or functional arrangement, one point is evident; there are many different levels within an organization and many different approaches to viewing these levels.

Research in the area of goal characteristics has been more abundant and specific than that in the area of organizational level. In the following discussion, a

brief review of studies involving goal characteristics is presented.

Goal Characteristics

As goals and goal-oriented management concepts have received more and more emphasis, organizational behavioralists have delved deeper and deeper into studies seeking explanations to goal phenomena. Several defineable goal characteristics or attributes have evolved from the extensive research. Prominent researchers in the field have been Richard M. Steers and Lyman W. Porter, who suggested the existence of six specific goal characteristics. In their studies, Steers and Porter

> . . . demonstrated the existence of five relatively autonomous attributes: (a) goal specificity, (b) participation in goal setting, (c) feedback on goal progress, (d) peer competition for goal attainment, and (e) goal difficulty [Steers & Porter, 1975, p. 436].

Steers and Porter used factor-analytic techniques to identify the above five specific attributes or characteristics. The sixth goal characteristic they considered important, although it was not derived through factor-analytic techniques, was "goal acceptance."

The six goal characteristics Steers and Porter considered important have been subjected to numerous field experiments and laboratory tests with mixed results in efforts to show their relationships to sundry other variables such as job characteristics, worker productivity, and

job satisfaction. The following discussion of goal characteristics summarizes research efforts conducted to expand the knowledge we have concerning each of the six goal characteristics.

Goal specificity. Goal specificity suggests the degree of direction a goal provides. Specifically stated goals contribute to increased worker performance because it makes clear to the individual what he is supposed to do. Research in this area has shown that ". . . subjects assigned specific goals improved in performance in trial blocks at a much faster rate than subjects assigned less specific goals [Steers & Porter, 1975, p. 436]." Bryan and Locke (1967) demonstrated that low motivation groups, when provided highly specific goals, could equal the performance of high motivation groups which did not have such clearly defined goals.

The effects of a goal setting program on productivity were studied (Raia, 1966) on a plantwide basis in a medium-sized manufacturing firm. Production during the thirteen-month period following implementation of the goal setting program increased by 18 percent over its previous level. The proposition that there is a positive relationship between goal setting and productivity was supported in later field studies (Umstot, 1977), demonstrating that people assigned specific goals achieved greater performance levels than those without.

Participation in goal setting. Martin Patchen suggested that employee participation in decision making aspects will lead to stronger perceptions of shared characteristics with management including perceptions of common goals, and that this will result in stronger feelings of loyalty to the organization (Patchen, 1970, p. 181). Conducting studies in selected units of the Tennessee Valley Authority, Patchen found that as participation increased, the perception of common purpose with management did indeed increase. The implication is that participation in decision making, including goal setting, tends to develop greater worker commitment to the organizational cause.

Advocates of goal setting participation argue that employee involvement in establishing goals tends to produce more meaningful goals. They tie their argument to the argument that goal appraisal should be based upon meaningful goals (Porter & Lawler, 1975, p. 335). A great deal of literature supports the view that when subordinates participate in setting their own goals, they develop ". . . a sense of 'ownership' of the goals, and their feelings of self-esteem and competence become more closely tied to their attempts to achieve the goals [Porter & Lawler, 1975, pp. 335-36]." Porter and Lawler emphasized that goal realism may be enhanced by employee participation, and that unilaterally set goals may be unrealistically easy or hard because the superiors lack information about the goals.

Because subordinates frequently know important information about the levels goals should be set at, their participation can often overcome this problem. Laboratory and field experiments support the view that employee participation increases goal setting effectiveness (Steers & Porter, 1974). However, opposing views have resulted and "the degree to which participation specifically influences the relation between goal setting and performance . . . remains to be determined [Steers & Porter, 1975, p. 438]."

Porter and Lawler attributed a partial explanation of the contradiction found in the literature concerning goal setting participation to the modifying effects of personality and environmental factors on the impact of participation. Investigation into the relationship of personality traits to goal setting participation has indicated that highly authoritarian personalities performed better when told what to do and how to do it without participating in the decisions (Odiorne, 1972, p. 145). Other research has shown that the situation or type of work also had significant effects on the results of goal setting participation. For instance, it has been shown that scientists are generally better producers when involved in determining what goals are to be pursued, but that insurance salesmen working on a commission basis do not produce as well when left alone to determine goals (Odiorne, 1972). Thus, while there is strong evidence that goal setting participation

is related to worker performance, there is also strong evidence that other factors moderate the relationship and must be taken into account when addressing the performance implications of goal participation.

Feedback. In order to achieve established goals, a "map" is needed to keep people moving in the right direction. One source of this direction is feedback, or knowledge of performance results. Feedback may be considered as serving two functions: (1) direction, keeping behavior on course; and (2) incentive, stimulating workers to greater effort. It seems reasonable that an individual can best improve his performance when he has knowledge of weaknesses in that performance, and that knowledge of success will serve as an incentive, a "pat on the back." The proposition that clear, unambiguous feedback improves the performance of individuals has been supported by results of laboratory and field research (Tosi, 1975a, p. 407). However, difficulty has been encountered in separating the effects of feedback from the effects of an individual's aspiration level. When these two variables have been separated, feedback alone has not been shown to be a significant influence on behavior. Thus, Locke, Cartledge, and Kneer (1970) concluded that feedback affects performance only to the extent that it prompts individuals to higher performance. In general, a review of research in

this area leads to the conclusion that if feedback causes an individual to be satisfied with his performance, he will not likely change his goal levels. However, if the feedback causes dissatisfaction, he may very well modify his goals.

Cummings, Schwab, and Rosen (1968) considered not only the presence or absence of positive/negative feedback but the amount and accuracy of the feedback as well. They concluded that only when employees are provided accurate feedback, based on clear goals, will they achieve maximum performance. A subsequent experiment conducted at General Electric Corporation (Meyer, Kay & French, 1975) demonstrated that not all feedback relates positively to performance. In general, negative feedback, especially a great deal of negative feedback, was found to have an adverse impact on performance.

Based on the results of the numerous research efforts directed toward the effects of feedback, it is apparent that several factors such as personal aspiration levels, personality traits, etc. serve as moderators, and that further research is necessary if firm conclusions are to be reached.

Peer competition. Another key characteristic of goal setting is that of peer competition for goal achievement. Considerable disagreement exists concerning the

effects of peer competition on worker performance. A number of researchers have concluded that a competitive atmosphere drives people toward greater achievement. Likert (1967), Locke (1968), and Steiner (1972) are among those who consider peer competition as a motivating force. Conflicting results have evolved from other research. Etzioni (1964) concluded that a high degree of competition may increase the quantity of an individual's work product, but that, typically, quality would be sacrificed. Additional research in this area is needed to analyze the effects on the competition-performance relationship by factors such as the nature of the technology, the degree of craftsmanship involved, and the type of reward system used. Also, because most research on the subject of competition versus performance has disregarded goal setting considerations, studies are needed in this area (Steers & Porter, 1974).

Goal difficulty. The degree of difficulty associated with a goal is another goal characteristic of concern to students of organizational behavior. The general conclusion supported by extensive research into the effects of goal difficulty on work performance is that performance will improve as goals are made more difficult up to a certain level of difficulty. It seems reasonable, however, that an "impossible task" will discourage a worker. Stedry

(1966) found that, indeed, there was a maximum level at which goal difficulty should be set and that if set too far beyond that level, the goal would tend to discourage a worker. He noted a result of this being either no real effort to achieve the goal, or a frenzy of self-defeating action. Stedry's research identified one particular phenomenon associated with goal difficulty which should be of concern to organizations involved with participative goal setting programs. He noted that when individuals set personal goals first, they tended to reject assigned goals, considered them too difficult, and did not appear to put forth sincere effort in achieving those goals. Steers and Porter concluded from Stedry's experiment that

> . . . higher group performance could result where the supervisor takes the initiative--and sets forth his--targets as a basis for discussion. The resulting group goal decisions should theoretically be higher than if the supervisor first asked for worker opinions as to goals and then offered his own [Steers & Porter, 1974, p. 442].

Other research has raised doubt about the time factor related to goal difficulty. Most research into the effects of goal difficulty has used relatively short time frames for evaluation. Additional research is needed to determine the duration of time over which moderately hard goals will be effective in increasing performance (Steers & Porter, 1974, p. 442).

Goal acceptance. Finally, goal acceptance is a characteristic which may be thought of as the sense of

ownership an individual feels for a goal. Previous discussion indicated that one of the aims in getting individuals to participate in setting goals was to develop in them a sense of ownership in the goals. Research has shown that participation tended to increase acceptance of goals although individual aspiration levels may not have originally been congruent with the goals (Steers & Porter, 1974). Apparently participation served to adjust aspiration levels in the direction needed for goal achievement.

Before a complete theory of goal setting can be formulated, additional research is needed to determine the impact of goal acceptance on goal attainment. In terms of congruence between assigned goals and personal aspiration levels, goal acceptance apparently represents an important variable and should be given careful consideration.

Review of studies made in the areas of organizational level and goal characteristics failed to reveal any attempt to investigate relationships existing between these two key variables. Justification for conducting such an investigation is discussed in the remaining portion of this chapter.

Justification

In theory, goal setting should have a significant impact on performance, employee attitudes, and need satisfaction. The literature supports the contention that the

act of setting goals on an individual basis has a strong positive relationship to increased performance. The findings (Bryan & Locke, 1967; Lawrence & Smith, 1955; French, Kay, & Meyer, 1965; Raia, 1965, 1966) have demonstrated this relationship in laboratory experiments and in the field. However, a gap exists in the explanation of what can be done to improve the effectiveness of goal setting (Steers & Porter, 1975, p. 441). This weakness in our understanding of goal phenomena has created a need for continued research and for investigation into specific aspects of existing goal theory.

Most research conducted in the area of phenomena associated with organizational level has operationalized "level" as a management-worker dichotomy. In so doing, the differentiation which exists between levels of real organizations has been largely ignored.

> This relative lack of attention to the effects of differentiation among levels within management is somewhat surprising when one considers the amount of interest the individual psychologists and sociologists have shown in the effect of divisions of labor [Porter & Lawler, 1965, p. 25].

Weaknesses in the studies relating to organizational level have had carry-over effects in other related areas of organizational behavior research.

Research on goal setting theory has been criticized for its lack of emphasis on investigating employee behavior in a natural work environment (Heneman & Schwab, 1972).

Use of simulated workers on simulated jobs has been the major area of criticism. Inferred by the use of simulation is the fact that attempts to relate goals to real world organizations have been scarce. Further, some areas of goal and organizational characteristic relationships have been completely neglected as far as behavioral studies are concerned. Attention has been called to the absence of studies attempting to determine such relationships in the case of one particular organizational characteristic. Concluding a review of research related to goals and organizational characteristics, Umstot noted that "no studies were found that related goal setting to organizational levels [Umstot, 1977, p. 18]."

The concept that employees at different levels within an organization may have differing views of organizational goals and place differing degrees of emphasis on those goals makes psychological sense. For instance, an owner of a construction company should have a far greater concern for the goals of his organization than would a ditch-digger working for the organization. In turn, employees at levels between the organization's owner and the ditch-digger would likely place varying degrees of emphasis on the organization's goals.

The relationship of goals to the various levels of an organization should be understood in order to effectively evaluate goals established for the organization.

This is especially true in situations involving management concepts such as MBO. One of the prime factors or elements of such management concepts is that

> Consistent factoring and communication of goals to lower organizational levels is necessary. The general objective of the organization must be continually broken down into smaller and smaller units [Tosi, 1975b, p. 411].

Because there is a lack of understanding concerning the relationship between goals and the levels to which people are assigned within organizations, managerial capability to effectively evaluate goals toward which group activities are directed may be limited. Through increased knowledge of relationships existing between organizational level and goal characteristics, managers might be better prepared to break goals down to meaningful increments for the different levels within their organization.

Summary

Conspicuous by its absence in all literature reviewed was any effort to determine relationships which may exist between each of the goal characteristics and organizational level. If goals are to be effectively broken down into increments and communicated through all organizational levels, then the relationship of goal characteristics to the various levels of an organization must be investigated.

Scope

The research scope was to investigate the relationship of task-goal characteristics to perceived organizational level in a military organization. Demonstration of causality was not attempted because of the added complexity of causal design.

Research Assumptions

An important assumption upon which the research was based was that an individual's perception of goal characteristics would accurately reflect the true nature of goals within his organization. Also made was the assumption that the level (undefined in conventional terms of position-power or management responsibility) at which an employee perceives himself is potentially more important as far as goal emphasis is concerned than the defined organizational level to which he is assigned.

Research Objective

The research objective was to determine if the emphasis individuals place on task-goal characteristics is related to the individual's perceived level within an organization.

Research Question

The research was intended to answer the following question: Is there a relationship between identified task-goal characteristics and perceived organizational level?

CHAPTER II

RESEARCH DESIGN AND METHODOLOGY

Introduction

The research had two distinct phases: the development and pretest of an instrument to measure goal characteristics and perceived organizational level; and the application of the developed instrument to a real organizational setting.

This chapter describes: (1) the development of the instrument used in the research effort; (2) the pretest of the questionnaire; (3) the population and sample selection process; (4) data collection procedures; and (5) analysis methodology.

Instrument Development

Goal Characteristics

A review of current literature disclosed items that reportedly measure goal characteristics. Goal related questionnaire items were taken from the "Task-Goal Attribute Questionnaire" (Steers, 1976, p. 9), and from a questionnaire designed by Umstot (Umstot, undated).

The five relatively autonomous goal characteristics used in Steers' "Task-Goal Attribute Questionnaire" and discussed in the previous chapter were:

1. Participation in goal setting
2. Feedback on goal effort
3. Peer competition
4. Goal specificity
5. Goal difficulty (Steers, 1976, p. 9)

Steers subjected his questionnaire to a reliability test to insure that it was a reliable instrument for measuring goal characteristics. The items used for measuring feedback, peer competition, goal specificity, goal difficulty, and participation were shown to be highly reliable. Steers' instrument for measuring these five goal characteristics was selected for use as the basic foundation in this research effort. Since review of other research failed to disclose a proven instrument for measuring goal commitment and acceptance, it was necessary to select an unvalidated instrument which appeared promising. The items used for measuring commitment and acceptance were designed by Umstot (Umstot, undated). The specific items selected for measuring particular goal characteristics and the sources of the items are shown in Figure 2-1. Some of the items are negatively phrased to reduce response bias.

A seven-point Likert scale (see Figure 2-2) was used in the questionnaire for deriving data values from the responses. For each item, the choices of response ranged from "strongly disagree" to "strongly agree." Use

NOTE: "R-S" identifies items requiring reverse scoring.

Commitment (Umstot)

I continue to work toward a goal even when it becomes difficult.

I give up easily if I can't reach the goal. (R-S)

I will work toward some goal for a long time before giving up.

Acceptance (Umstot)

I accept the work objectives or goals for my job.

I accept the specific goals or standards set for my job.

I do not try to meet the goals established for this job. (R-S)

Participation in Goal-Setting (Steers)

I am allowed a high degree of influence in the determination of my work objectives.

I really have little voice in the formulation of my work objectives. (R-S)

The setting of my work goals is pretty much under my own control.

My supervisor usually asks for my opinions and thoughts when determining my work objectives.

Feedback (Steers)

I receive a considerable amount of feedback concerning my quantity of output on the job.

Fig. 2-1. Sources and Items Used for Goal Characteristics

Feedback--Continued (Steers)

I am provided with a great deal of feedback and guidance on the quality of my work.

My boss seldom lets me know how well I am doing on my work toward my work objectives. (R-S)

Peer Competition (Steers)

Most of my co-workers and peers try to out-perform each other on their assigned work goals.

There is a very competitive atmosphere among my peers and I with regard to attaining our respective work goals; we all want to do better in attaining our goals than anyone else.

Specificity (Steers)

My work objectives are very clear and specific; I know exactly what my job is.

I think my work objectives are ambiguous and unclear. (R-S)

I understand fully which of the work objectives are more important than others; I have a clear sense of priorities on these goals.

Difficulty (Steers)

I should not have too much difficulty in reaching my work objectives; they appear to be fairly easy. (R-S)

My work objectives will require a great deal of effort from me to complete them.

It will take a high degree of skill and know-how on my part to attain fully my work objectives.

My work objectives are quite difficult to attain.

Fig. 2-1--Continued

of the Likert scale and data capture procedures described later in this chapter made it possible to accomplish mathematical processes with the data. Previous research indicated that behavioral data in this form is amenable to factor analytic techniques (Steers, 1976).

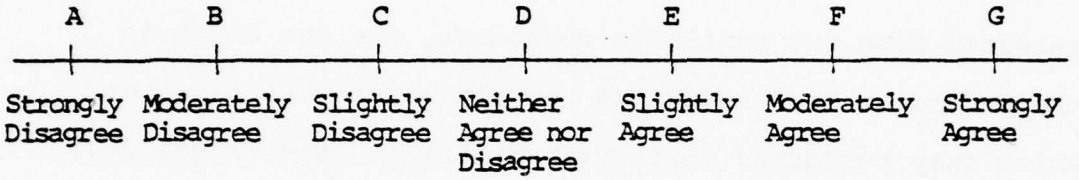


Fig. 2-2. A Seven-point Likert Scale

The goal characteristics measured by the goal instrument were to be eventually investigated for relationships with the second key variable, perceived organizational level.

Perceived Organizational Level

Definition of organizational level was limited for the purpose of this research effort. Survey participants were instructed to consider their position within the organization to which they were assigned. Thus, subjects were to identify their perceived location within the structure of their work group and not relate it to the structure of the entire Air Force organization. Thus, *perceived* organizational level was measured, and not level as defined in such traditional organizational terms as rank, position, or title.

The single item instrument used for measuring perceived organizational level consisted of a continuum scale, similar to the Likert scale, on which the respondent identified his work position (see Appendix A). The ten-point scale was unanchored with "top level" indicated at one extreme and "bottom level" at the other. Respondents selected from the available responses, the one which in their opinion best indicated the organizational level at which they performed their primary duties (see Figure 2-3).

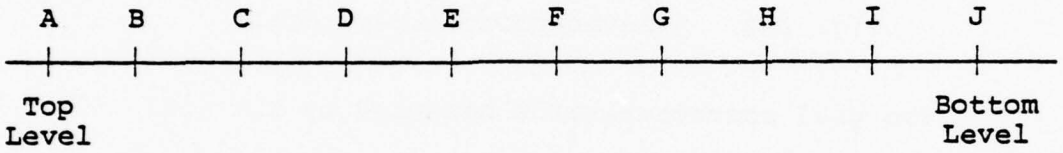


Fig. 2-3. Perceived Organizational Level Scale

The complete questionnaire, including the goal characteristic instrument, the organizational level instrument, and instruments for obtaining respondents' grade data and miscellaneous other information not directly associated with the research can be found in Appendix A.

To assess the validity of the questionnaire in measuring goal characteristics, a pretest was conducted.

Pretest of Goal Questionnaire

The questionnaire was administrered to students of the School of Systems and Logistics, Air Force Institute of Technology. Three sections of the 1977B class were

selected for sampling purposes based on instructor cooperation and class scheduling. All military individuals within the selected classes completed the questionnaire on the day it was administered. Since answers to the questionnaire items were based on the individual's previous duty assignment rather than on his present student assignment, two second lieutenants who had no previous duty assignments were not administered the questionnaire. A total of sixty-three individuals completed the questionnaire.

Using data gathering procedures and analytic techniques described later in this chapter, a factor analysis was performed on the pretest data. The *a priori* assumption was that the selected items would separate into seven factors. However, the factor analysis resulted in only five easily identifiable factors.

Two items used on the pretest questionnaire failed to meet the factor loading criterion of .40 or greater in any factor. In addition, both of the items achieved a relatively low value of communality. Four additional items failed to achieve significant communality or load significantly into any single identifiable factor.

Although the pretest of the goal questionnaire pointed to six doubtful questionnaire items and a five factor solution as optimal, the complete questionnaire was retained for use in the primary research effort. To have

eliminated items from the questionnaire based on the results of such a relatively small sample (N=63) as that used in the pretest could have resulted in degradation of the research effort. It was anticipated that the much larger size of the research sample would provide a significant reduction in the magnitude of the sample error.

Population and Sample

Many organizations within the Air Training Command (ATC) have recently implemented MBO programs. ATC was selected as the population from which the sample subjects for this research effort would be drawn. Seven major ATC organizations and a total of sixty-four subunits of those organizations were identified as representative of ATC from which the sample was to come. The researchers originally requested a random sample of 100 to 300 subjects from each major organization stratified according to sub-units. The total size of the requested sample was 1,900.

However, the full requested sample could not be drawn. Instead, a randomly drawn sample of 520 was selected. The sample was stratified through 49 military installations and over 100 subordinate organizations of typical ATC units.

The list of selected subjects was received in the form of a computer card deck from the Air Force Military Personnel Center. A data file was established for the

Honeywell 635 computer system using the card deck as an input, and a computer program was developed for extracting necessary information from the raw data. Figure 2-4 illustrates the format of the raw data file and identifies pertinent data fields.

```
    A              B                          C      D    E  FG
    |              |                          |      |    |  ||
RJOJFN62CITIZEN JOHN Q                  999999999 0560FTASQ03
RJOJFCKXDOE JOE E                       111001111 3300STUSQ35
```

A - Personnel accounting symbol (PAS code): identifies the installation to which an individual is assigned.
B - Last name, first name, middle initial.
C - Social Security Account Number.
D - Numeric designator of an individual's organization.
E - Organization (FTASQ = Field Training Squadron, STUSQ = Student Squadron, etc.).
F - "0" indicates officer. "3" indicates enlisted.
G - The number reflected indicates grade. For instance, If Column F=0 and G=3, the grade is 0-3 for Captain. If Column F=3 and G=5, the grade is E-5 or Staff Sergeant.

Fig. 2-4. Selected Sample: Raw Data Format

Survey questionnaires were mailed on 27 May 1977 to the 520 selected subjects including 125 officers and 395 enlisted personnel (Appendix A). The 18 July 1977 cutoff date for data collection was established to insure adequate time for analysis and reporting. As the questionnaires were returned, the data was captured to a computer file for data analysis as described on the following pages.

Analysis Methodology

Factor Analysis

Prior to exploration of relationships between perceived organizational level and task-goal characteristics, determination of which goal characteristics were represented by the survey questionnaire was required. A factor analysis was performed on questionnaire items 4 through 25, the goal-related items.

The purpose of the factor analysis was to determine whether or not the twenty-two separate questionnaire items could be combined into a few groups or factors identifiable as goal characteristics. This analysis basically consisted of determining the intercorrelations existing between the separate responses to the twenty-two goal related items and ascertaining whether or not the variations could be accounted for adequately by a number of basic categories smaller than twenty-two (Fruchter, p. 1).

A priori assumptions about the selected items for the questionnaire led to the belief that seven factors would emerge from the factor analysis. It was therefore necessary to determine whether or not the questionnaire contained a sufficient number of variables (items) to permit *at least* seven factors to emerge. Equation 2-1 (Thurston, pp. 291-294) was used to determine the number of variables (n) required to determine (r) unique factors.

$$n = \frac{2r + 1 + \sqrt{8r + 1}}{2} \qquad \text{(Equation 2-1)}$$

The *a priori* (R=7) value applied to Equation 2-1 (Fruchter, p. 69) yields:

$$n = \frac{2(7) + 1 + \sqrt{8(7) + 1}}{2}$$

$$n = 12$$

Because there were 22 items in the questionnaire, the minimum required number of items was exceeded. In this respect, the number of questionnaire items was more than adequate.

Although it was believed that perhaps seven factors would emerge from the factor analysis, precautions were necessary to insure that the results would not be forced into an unrealistically limited number of factors because of an insufficient number of questionnaire items. A test was made using Equation 2-2 (Fruchter, p. 69).

$$r = \frac{2n + 1 - \sqrt{8n + 1}}{2} \qquad \text{(Equation 2-2)}$$

where: r = number of unique factors, and

n = number of variables.

Substituting 22, the number of variables (items) in the questionnaire for n resulted in:

$$r = \frac{2(22) + 1 - \sqrt{8(22) + 1}}{2}$$

$$r = 15.8668 = 15$$

Since fifteen exceeded the expected number of factors, the 22-item questionnaire was considered suitable.

The factor analysis was performed using the Honeywell 635 computer system with written programs to activate subprograms from the Statistical Package for Social Sciences (SPSS) (Nie, *et al.*, 1975).

Subprogram FACTOR of SPSS, version 6 (Nie, *et al.*, pp. 468-514) was used to accomplish the factor analysis. The method chosen for use with subprogram FACTOR was PA2, principal factoring with iteration, a widely accepted method capable of accommodating the factoring needs of this research effort. The solution was rotated using a varimax orthogonal rotation (Nie, *et al.*, p. 485). Varimax was used to maximize the squared loadings in each column and to provide a measure of isolation and stability if it became necessary to delete any item(s).

Selection of the final factor solution was based on the criteria of parsimony and interpretability. Only items with factor loadings of .40 or greater were retained for consideration in the correlational analysis. The value of .40 established as the determinant of significant or "substantial" loading was more conservative than that

used by Guilford (Guilford, p. 500) and was used to facilitate analysis and increase the validity of the results.

The method employed in deriving the optimal factor solution (5 factors) included use of the Kaiser criterion applied to eigenvalues, Cattell's scree test, and practical and psychological interpretation.

The Kaiser criterion was used as a decision rule for determining the number of factors to retain in the solution (Kaiser, 1960). The rule states that only factors with eigenvalues (factor contributions) of 1.0 or greater should be retained in a factor analysis.

The Cattell scree test was to serve as a means of identifying and eliminating error factors.

Practical and psychological interpretations of the factor analysis results were applied in labeling factors as particular goal characteristics.

Goal characteristics (final solution factors) were treated as the dependent variables and perceived organizational level as the independent variable in subsequent correlational studies. Techniques used in conducting the correlational analysis are discussed in the remaining portion of this chapter.

Correlational Analysis

SPSS subprograms PEARSON CORR and NONPAR CORR were used for performing bivariate correlational analysis of

the data. The function of each program was to summarize the relationships existing between perceived organizational level and each of the identified goal characteristics.

Parametric correlations. For a parametric analysis, which assumes a normal distribution of the cases on the variables, subprogram PEARSON CORR was used. PEARSON CORR computes Pearson product-moment correlations for pairs of variables. The coefficient (r) of the Pearson correlation indicates the strength of the relationship between the subject variables.

> Mathematically, r is defined as the ratio of covariation to the square root of the product of the variation in X and the variation in Y, where X and Y symbolize the two variables [Nie, *et al.*, p. 280].

Subprogram PEARSON CORR uses the following formula for computing the Pearson correlation coefficients:

$$r = \frac{\sum_{i=1}^{N} X_i Y_i - \left(\sum_{i=1}^{N} X_i\right)\left(\sum_{i=1}^{N} Y_i\right)/N}{\left\{\left[\sum_{i=1}^{N} X_i^2 - \left(\sum_{i=1}^{N}\right)^2\right]\left[\sum_{i=1}^{N} Y_i^2 - \left(\sum_{i=1}^{N} Y_i\right)^2 /N\right]\right\}^{1/2}}$$

(Equation 2-3)

where: X_i = ith observation of variable X,

Y_i = ith observation of variable Y, and

N = number of observations.

Significance test results are derived through use of Student's t values with N-2 degrees of freedom (Nie, *et al.*, pp. 280-81).

A critical Z-test was conducted as an alternative significance measure for correlation coefficients in the parametric analysis.

Nonparametric correlations. Option 6 was used with subprogram NONPAR CORR in order to perform both Spearman and Kendall correlations. With each of these two nonparametric analytic techniques, there is no requirement for assumptions regarding the data distribution (Nie, *et al.*, p. 277).

> The chief differences between Spearman's (rho) and Kendall's tau seem to be that Kendall coefficients are somewhat more meaningful when the data contain a large number of tied ranks. Spearman's (rho), on the other hand, seems to yield a closer approximation to product-moment correlation coefficients when the data is more or less continuous, i.e., not characterized by a large number of ties at each rank [Nie, *et al.*, p. 289].

Option 3 was used with each of the SPSS subprograms for correlational analysis. Option 3 overrides a 1-tail significance test default function of SPSS and causes a 2-tailed significance test to be performed instead. Since no expectations regarding the direction of relationships between perceived level and task-goal characteristics were held, a 2-tail significance test was appropriate (Nie, *et al.*, pp. 283-84).

Results of the methodology are presented in the following chapter.

CHAPTER III

RESULTS

Introduction

The purpose of this chapter is to present the data collected from the questionnaire and report the results of the analyses.

Table 3-1 provides pertinent data relating to the administration of the questionnaire.

TABLE 3-1

QUESTIONNAIRE ADMINISTRATION

27 May 1977	520 questionnaires mailed (125 to officers, 395 to enlisted personnel)
18 July 1977	288 completed questionnaires returned
	288 completed questionnaires were useable

NOTE: Frequency distributions of responses to questionnaires are contained in Appendix B.

Of the 288 individuals responding to the survey, 94 were officers, and 194 were enlisted personnel. The rank (grade) distribution of the respondents is indicated in Table 3-2. Slightly over 55 percent of the selected subjects responded, including 75 percent of the selected officers and 49 percent of the selected enlisted subjects. Because of the

very broad rank distribution and the diversity of the organizations from which subjects were drawn, the total sample was considered representative of the Air Training Command.

TABLE 3-2

RANK DISTRIBUTIONS OF RESPONDING SURVEY SUBJECTS

Officers		Enlisted	
0	2nd Lieutenants (0-1)	4	Airman Basics (E-1)
18	1st Lieutenants (0-2)	7	Airmen (E-2)
50	Captains (0-3)	21	Airmen 1st Class (E-3)
12	Majors (0-4)	32	Senior Airmen/Sergeants (E-4)
11	Lt. Colonels (0-5)	53	Staff Sergeants (E-5)
3	Colonels (0-6)	41	Technical Sergeants (E-6)
0	Brigadier Generals or above (0-7)	25	Master Sergeants (E-7)
		10	Senior Master Sergeants (E-8)
		1	Chief Master Sergeant (E-9)

The collected data were subjected to the techniques described in Chapter II to determine which identifiable factors (goal characteristics) the survey instrument was actually measuring, and the relationships existing between each of the goal characteristics and perceived organizational level. Results of the analyses are presented below.

Factor Analysis

Prior to the factor analysis of the questionnaire, and ignoring the inconclusive pretest results, the researchers did not know whether the twenty-two items relating to goals would separate into factors readily identifiable as

goal characteristics. Since the results of the factor analysis were to serve as the basis for the subsequent correlational studies involving goal characteristics and organizational level, only those factors which could be clearly identified as goal characteristics could be used.

Table 3-3 reflects the final analysis results. Four questionnaire items failed to meet the inclusion criterion, and are identified in the table under "EXCLUDED ITEMS."

As noted earlier, an eigenvalue of 1.0 or greater would meet the criterion for factor retention. Eigenvalues for each of the seven factors retained in the final solution by SPSS subprogram FACTOR prior to axis rotation are reflected in Table 3-4.

Cattell's scree test was used for the elimination of error factors (Figure 3-1). Error factors are those factors which have equal and low factor contributions (Cattell, 1966). The point at which the scree occurs is that point at which the curve approaches horizontal. All factors to the left of this point are real factors; those to the right are error factors. The percent of variance accounted for by factors to the right of that point will continue to progress toward zero in ever-decreasing amounts. Some difficulty is associated with interpreting the results of the scree test in that the precise point at which a scree has appeared is difficult to ascertain. The scree

TABLE 3-3

FACTOR ANALYSIS OF GOAL CHARACTERISTICS INSTRUMENT

Factors and Items	Factors I	II	III	IV	V	Communality
Factor 1: Participation						
S9. I am allowed a high degree of influence in the determination of my work objectives.	.71	.09	.16	.13	.24	.54
S13. I really have little voice in the formulation of my work objectives.	.73	.02	.11	.12	.05	.48
S19. The setting of my work goals is pretty much under my own control.	.65	-.03	.07	.07	.06	.41
S25. My supervisor usually asks for my opinions and thoughts when determining my work objectives.	.61	.12	.37	.04	.01	.49
Factor 2: Difficulty						
S10. Most of my co-workers and peers try to out-perform each other on their assigned work goals.	.13	.61	.18	.23	.02	.51

TABLE 3-3--Continued

Factors and Items	Factors I	II	III	IV	V	Communality
S12. My work objectives will require a great deal of effort from me to complete them.	.03	.60	.08	.08	.02	.36
S18. It will take a high degree of skill and know-how on my part to attain fully my work objectives.	.02	.56	.03	.12	.26	.35
S21. There is a very competitive atmosphere among my peers and I with regard to attaining our respective work goals; we all want to do better in attaining our goals than anyone else.	.26	.48	.24	.20	.08	.52
S24. My work objectives are quite difficult to attain.	-.09	.64	.01	-.14	.07	.39
Factor 3: Feedback						
S6. I receive a considerable amount of feedback and guidance on the quantity of output on the job.	.18	.08	.77	.03	.10	.59

TABLE 3-3--Continued

Factors and Items	Factors I	II	III	IV	V	Communality
S20. My boss seldom lets me know how well I am doing on my work toward my work objectives.	.33	.03	.48	.18	.10	.40
S22. I am provided with a great deal of feedback and guidance on the quality of my work.	.13	.11	.85	.18	.10	.64
Factor 4: Specificity						
S11. My work objectives are very clear and specific; I know exactly what my job is.	.13	.02	.18	.69	.10	.46
S16. I accept the specific goals or standards set for my job.	-.02	.12	-.05	.40	.17	.26
S17. I think my work objectives are ambiguous and unclear.	.18	.01	.18	.78	.09	.53
S23. I understand fully which of my work objectives are more important than others; I have a clear sense of priorities on these goals.	.30	.05	.32	.41	.20	.39

TABLE 3-3--Continued

Factors and Items	Factors I	II	III	IV	V	Communality
Factor 5: Commitment						
S7. I continue to work toward a goal even when it becomes difficult.	.01	.05	.16	.02	.66	.26
S8. I accept the work objectives or goals for my job.	.18	.17	.05	.29	.43	.36
EXCLUDED ITEMS						
S4. I give up easily if I can't reach the goal.	.15	.06	-.01	.05	.31	.17
S5. I should not have too much difficulty in reaching my work objectives; they appear to be fairly easy.	-.03	.36	-.05	-.03	-.01	.18
S14. I do not try to meet the goals established for this job.	.03	.04	.06	.07	.14	.10
S15. I will work toward some goal for a long time before giving up.	-.01	-.002	.02	.05	.30	.13
Percent of Variance Explained (prior to rotation)	22.7	10.8	7.6	6.5	6.0	
Cumulative Percent	22.7	33.5	41.1	47.6	53.7	

TABLE 3-4

FACTORS WITH EIGENVALUES GREATER THAN ONE

Factor	Eigenvalue	Percent of Variance
1	4.99882	22.7
2	2.37162	10.8
3	1.68199	7.6
4	1.42821	6.5
5	1.32366	6.0
6	1.11568	5.1
7	1.04520	4.8

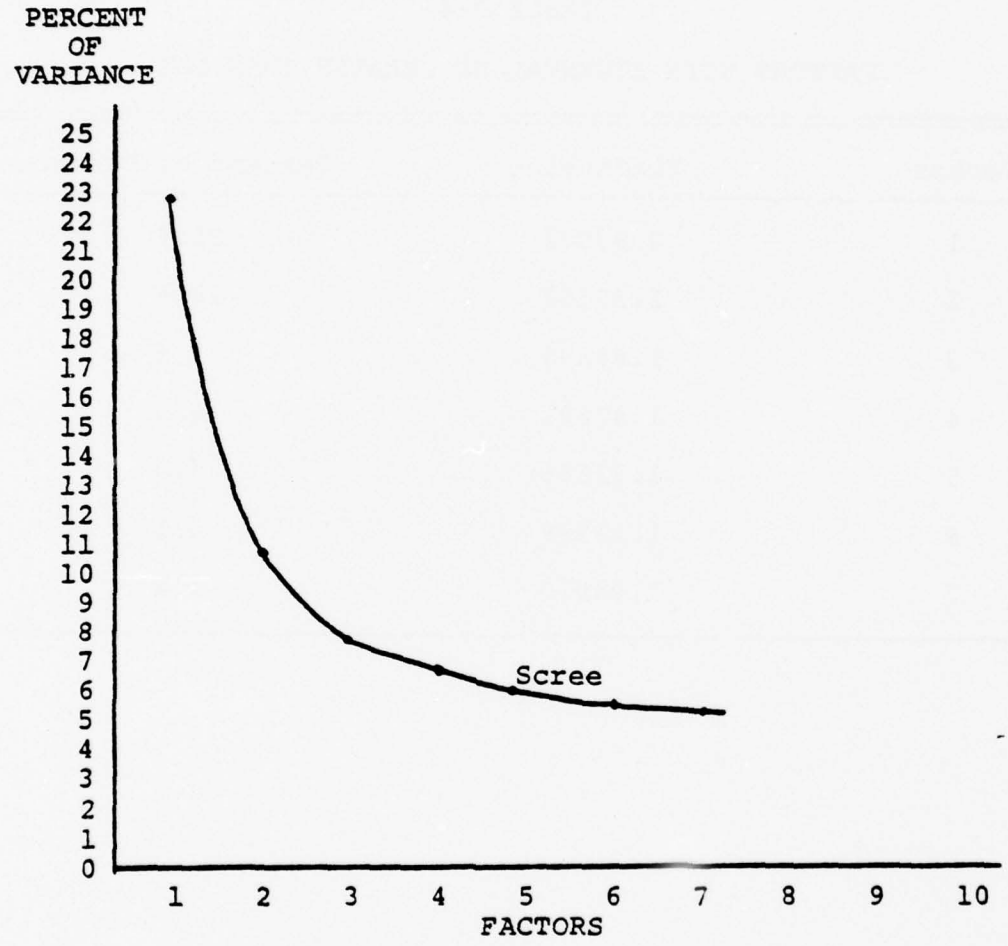


Fig. 3-1. Cattell's Scree Test for Factors

test was used in conjunction with the other techniques described to identify factors for use in the correlational studies.

The Kaiser criterion and Cattell scree were considered along with the practical and psychological significance of the factors. The five-factor solution fit the decision rules of Kaiser and Cattell and made practical and psychological sense. There were seven factors that displayed eigenvalues of 1.0 or greater. Only five of these factors could be identified as goal characteristics, however. The remaining two factors could not be identified and were declared residual to the analysis. Each of the five factors retained had an eigenvalue greater than 1.0, and the scree appears to begin at approximately the five-factor point on the plot.

The five identifiable factors that emerged from the analysis were:

1. Participation
2. Difficulty
3. Feedback
4. Specificity
5. Commitment

Two of the seven *a priori* goal characteristics identified in Figure 2-1 failed to factor using the collected survey data. These two goal characteristics were:

1. Acceptance

2. Peer-Competition

In addition to the failure of two characteristics to emerge as identifiable factors, two questionnaire items (10 and 21), originally assumed to be measures of peer-competition, loaded into the factor identified as Difficulty. One item (16), originally assumed to measure goal acceptance loaded into factor 4, Specificity.

Table 3-5 reflects a composite of the identified factors with the mean scores and standard deviations of the responses to the goal-related items in the questionnaire. Histograms for each of the items are contained in Appendix B and display, for each item, the number of responses to each alternative.

TABLE 3-5

CHARACTERISTICS, MEANS AND STANDARD DEVIATIONS

Characteristic	N=	Mean	Standard Deviation
Feedback	288	3.6921	1.7467
Specificity	288	3.6921	1.7467
Participation	288	3.5634	1.6618
Difficulty	288	3.4653	1.4020
Commitment	288	4.5035	1.3291

Table 3-6 indicates the number of survey subjects selecting each of the available responses to the perceived organizational level measurement in the questionnaire.

TABLE 3-6

RESPONSES TO "LEVEL" (ITEM 26)

Level	N=
0 (Top)	24
1	32
2	51
3	45
4	44
5	15
6	21
7	20
8	12
9 (Bottom)	24
Mean = 3.8125	
Standard Deviation = 2.6278	
N = 288	

Correlational Analysis

The goal characteristics identified through factor analysis were treated as dependent variables for correlational analyses with perceived organizational level treated as the independent variable. Pearson product-moment correlations (parametric) and Spearman and Kendall correlations (nonparametric) were performed. Assumptions common to such analyses were made and are specifically stated in the following discussion of the correlational analyses results.

Parametric Results

The collected data were subjected to the Pearson product-moment correlation using SPSS subprogram PEARSON

CORR. It was necessary to make two assumptions about the data. First, the data were assumed to be normally distributed; and second, it was assumed to be of an interval scale. In making the second assumption, the researchers considered the Likert scale to be an interval scale measurement of goal characteristics. These same measurements of goal characteristics were used by Steers (1976, pp. 6-15).

The correlation coefficients provided by the Pearson technique indicate the degree to which a change in one variable is related to a change in another. The SPSS subprogram used to perform the Pearson correlation provided the coefficients listed in Table 3-7.

TABLE 3-7

PEARSON CORRELATION COEFFICIENTS (r)
(N = 288)

Variable Pair	r	Significance
Level with Feedback	.1634	.005
Level with Specificity	.1630	.006
Level with Participation	.4228	.001
Level with Difficulty	.2061	.001
Level with Commitment	.3335	.001

A critical Z-test was also used as a significance check for the Pearson correlation coefficients. The critical Z-test results are shown in Table 3-8.

TABLE 3-8

SIGNIFICANCE OF r
(N = 288)

Variable Pair	r Coefficient	Z-test	Decision
Level with Feedback	.1634	2.76	Significant
Level with Specificity	.1630	2.76	Significant
Level with Participation	.4228	7.15	Significant
Level with Difficulty	.2061	3.49	Significant
Level with Commitment	.3335	5.64	Significant

NOTE: If Z is greater than $\pm$ 1.96, then r is significant at the .05 level using a two-tailed test.

Nonparametric Results

Further tests of the data were conducted using the Spearman and Kendall nonparametric correlational analyses. Use of nonparametric correlational analysis offers at least two distinct advantages over parametric methods: (1) there is no requirement to assume a normal distribution of the sample data; and (2) data on which the nonparametric techniques are to operate need be of only ordinal scale. Results of the Spearman and Kendall nonparametric analyses, rho or tau respectively, provide a measure of how similar (or dissimilar) the ranking is between the respondents of various levels and their perception of goal characteristics.

The collected data demonstrated no characteristics that suggest an advantage of the tau measurement over the measurement of rho, or vice-versa. In practice, there are

no fixed rules for making this distinction (Nie, *et al.*, p. 289). Both correlations were used.

Kendall's tau. The coefficient of tau will range from +1.0 to -1.0. A coefficient of +1 or -1 indicates a perfect fit, or that the relationship is similar in a positive or negative direction. As the coefficient approaches zero the relationship is defined as more dissimilar than similar. In Table 3-9 the variables of goal characteristics and perceived organizational level are shown with their computed Kendall correlation coefficients (tau).

TABLE 3-9

KENDALL'S TAU
(N = 288)

Variable Pair	Tau Coefficient	Significance
Level with Feedback	.1138	.008
Level with Specificity	.1347	.002
Level with Participation	.3036	.001
Level with Difficulty	.1298	.002
Level with Commitment	.2815	.001

Spearman's rho. The coefficient of the Spearman's test, rho, is interpreted in the same manner as was the coefficient for the Kendall test. In Table 3-10, the variables of goal characteristics and organizational level are shown with computed correlation coefficients (rho).

TABLE 3-10

SPEARMAN'S RHO
(N = 288)

Variable Pair	Rho Coefficient	Significance
Level with Feedback	.1524	.010
Level with Specificity	.1813	.002
Level with Participation	.4112	.001
Level with Difficulty	.1796	.002
Level with Commitment	.3711	.001

The results were in some cases inconclusive. In other cases, current goal theory was supported. In some instances, however, there is evidence that impacts goal theory as it now stands. Discussion, conclusions and recommendations based on the research results are presented in the final chapter.

CHAPTER IV

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

In this chapter the results of the analyses are discussed, conclusions drawn from the results are presented, and recommendations relating to the research effort are offered.

Discussion

Perceived Organization Levels

The methodological difficulty of measuring actual organizational level has been well documented in the literature. Following Porter (1963), the research effort attempted to measure perceived organizational level. The assumption stated in Chapter I was that an individual's perceived level may differ significantly from his grade, position, title, or organizational level defined in other such formal or traditional terms. Indeed, as can be seen in a comparison of Tables 3-2 and 3-6, perceived level and actual rank level were largely unrelated. Suggested reasons for this phenomenon are presented in the following discussion.

The amount of organizational responsibility or authority an individual has is, in many instances, more a function of the job he holds than of his rank. Within a

given military organization, it is quite feasible for a low ranking individual to perceive himself at a relatively high level within the organization, while a higher ranking individual perceives himself at a very low organizational level. In each position, the degree of authority to influence behavior of others may contribute to the perceptions developed by individuals in those positions. It seems reasonable that the more direct control over subordinates an individual has, the greater his perception of importance to the organization will be, and thus the higher will be his perceived organizational level. To illustrate, consider a common situation in which a Staff Sergeant is a supervisor in charge of a group of twenty or so aircraft maintenance technicians. A Captain belonging to the same organization is assigned to a staff position in which he has no supervisory duties. The Staff Sergeant may well view his position as being toward the top level of the organization because of the supervisory power and responsibility inherent in his job while the Captain views his position as low within the organization because of his relative lack of immediate supervisory power and responsibility. In both cases, aspects of the respective jobs influence perceptions individuals have of the organizational level at which they perform their duties.

Organizational climate may also influence perceptions individuals have regarding their organizational level.

Perceptions may be distorted to either high or low ends of the level scale depending on whether the individual finds himself in what he considers a favorable or an unfavorable organizational climate.

Stigmas are sometimes associated with various ranks. These stigmas may have negative or positive connotations, and may come from within an individual or from those with whom he works. To illustrate, a Second Lieutenant may be regarded as incompetent merely because he is a "new" junior officer (negative stigma), or because he is an officer, he may be regarded as "energetic and aspiring" (positive stigma). The manner in which he senses his subordinates, peers, or supervisors regarding him, as well as the manner in which he personally thinks of his rank may well influence his sense of importance to the organization, and thus, distort his perception toward high or low ends of the level scale.

These suggestions point to a speculation that while perceived organizational level might be more amenable to operationalizing than objective measures of the variable, the many antecedent components combine to form a complex construct. The complexity of the perceived organizational level variable poses difficult analytical problems. However, the results of this research show that the scaled perceptual measure permits more extensive analysis than the traditional measures. The conclusion drawn is that

the interval scaled perceptual measure is methodologically superior to the nominal or ordinal scaled measures commonly used. This methodological superiority permits use of parametric techniques for correlational analysis with other multidimensional variables (such as goal characteristics) in an attempt to explain behavior.

Goal Characteristics

Basic descriptions of the factor analysis and correlational analyses results were presented earlier in this report. Additional details of the results were reserved for inclusion in this chapter in order to facilitate the discussion of relationships indicated by the analysis. Sequentially, the relationships of Factors I through V with perceived organizational level are discussed in the following portion of this chapter.

Factor I--Participation. Each of the four questionnaire items (9, 13, 19, and 25) designed to measure individual emphasis on participation in goal setting loaded into Factor I (Table 3-3). Terms contained in the four items included "high degree of influence," "formulation of objectives," "setting of work objectives," "control," and "my opinions and thoughts." Psychological sense could be made in associating these various terms, and "participation" was considered the common thread linking the four questionnaire items. The factor alignment of these items

replicates the results of Steers' (1976) experiment discussed in Chapter I. The four items had a mean loading of .67. Factor I, Participation, displayed a high positive correlation to perceived organizational level. This correlation was present in both the parametric and nonparametric tests. The Pearson (parametric) test correlating perceived level with participation resulted in a correlation coefficient (r) of .4228 with statistical significance of .001. A two-tailed critical Z-test of the significance of the sample statistic (r) resulted in a 7.15 value for Z (Table 3-8). Because the value of Z was greater than +1.96, the results indicated that the correlation coefficient was statistically significant.

The results of the Spearman and Kendall nonparametric tests also indicated a positive correlation between emphasis on participation and the perception of organizational level. The Spearman test produced a correlation coefficient (rho) of .4112, also significant at the .001 level (Table 3-10).

Results of the Kendall test indicated a slightly weaker relationship between participation and perceived organizational level. A correlation coefficient (tau) of .3036 was indicated (Table 3-9). As were the statistics of the two previous tests, tau was significant at a level of .001. Although the magnitude of the Kendall correlation

coefficient was slightly less than the coefficients of the other tests, it too indicated a clear relationship.

The results of both parametric and nonparametric tests, therefore, indicate a positive relationship between an individual's perceived level in his organization and the emphasis he places on participation.

Factor II--Difficulty. Five of the questionnaire items (10, 12, 18, 21, and 24) loaded highly into Factor II with a mean loading value of .58. Although *apriori* assumptions were that the items which loaded into factor II would, instead, separate into two separate factors, peer-competition and difficulty, the actual factoring results were psychologically understandable.

The descriptive terms used in items 10 and 21, items originally thought to measure peer-competition, suggest a situation entailing a relatively high degree of difficulty. The two items contained the phrases "out-perform," "we all want to do better," and "very competitive atmosphere" which connotate a demanding or difficult work situation. Items 12, 18, and 24 are perhaps more clearly linked to a concept of difficulty by their inclusion of such phrases as "a great deal of effort," "high degree of skill and know-how," and "difficult to attain." Because of the common theme of difficulty among the five items loading into Factor II, the goal characteristic represented was logically interpreted to be difficulty.

The Pearson (parametric) technique correlating perceived organizational level with difficulty failed to demonstrate a strong relationship between the two variables (Table 3-7). A correlation coefficient (r) of only .2061 was indicated, significant at the .001 level. Significance was confirmed by a critical Z-test which resulted in a Z value of 3.49 (Table 3-8).

Nonparametric tests also failed to indicate a strong relationship between the subject variables. The analyses provided a Spearman's correlation coefficient (rho) of only .1796 (Table 3-10) and a Kendall's correlation coefficient (tau) of only .1298 (Table 3-9). Both coefficients were significant at the .002 level.

Factor III--Feedback. All three questionnaire items (6, 20, and 22) originally believed to be measurements of the feedback characteristic of goals loaded decisively into Factor III. Factor III was therefore labeled "Feedback," and had a mean factor loading of .70 (Table 3-3).

A Pearson (parametric) test correlation perceived organizational level with feedback produced a correlation coefficient (r) of .1634, significant at the .005 level (Table 3-7). A critical Z-test resulted in a Z value of 2.76 (Table 3-8). Though significant, the relationship between perceived level and feedback was not strong.

Nonparametric tests also indicated a weak relationship between perceived level and feedback. The Kendall test produced a coefficient (tau) of only .1138, significant at the .008 level (Table 3-9), and the Spearman test, a coefficient (rho) of .1524 significant at the .010 level (Table 3-10).

Factor IV--Specificity. Items 11, 16, 17, and 23 loaded into Factor IV with a mean loading value of .57 (Table 3-3). With the exception of item 16, all items loading into Factor IV were originally intended to measure goal specificity. Item 16 was originally considered a measurement of goal acceptance. However, wording in item 16, "I accept the specific goals," readily lends the statement to measurement of goal specificity. Although item 16 met loading criteria, the use of the two terms "accept" and "specific" possibly contributed to its relatively low loading value (.4). Responses to this item were likely dependent upon which of the two key words received respondent emphasis. The communality value for item 16 was .26 (Table 3-3).

The Pearson (parametric) test correlating perceived level with specificity resulted in a correlation coefficient (r) of .1630 (Table 3-7) at a significance level of .006. A critical Z-test produced a Z value of 2.76 (Table 3-8).

Spearman and Kendall (nonparametric) tests produced similarly low correlation coefficients. Results indicate

a Spearman's rho of .1813, significant at a .002 level (Table 3-10) and a Kendall's tau of .1347, significant at the .002 level (Table 3-9).

Results of this research, therefore, indicate that there is not a strong relationship between perceived organizational level and the goal characteristic, specificity.

Factor V--Commitment. Two of the questionnaire items (7 and 8) loaded into Factor V with a mean loading value of .55 (Table 3-3). From the phrases "I continue to work toward a goal" (item 7) and "I accept the work objectives" (item 8), there existed a common theme the researchers interpreted as "*Commitment.*"

The Pearson (parametric) test correlating perceived organizational level to commitment resulted in a correlation coefficient (r) of .3335 significant at a .001 level (Table 3-7). A critical Z-test produced a Z value of 5.64 (Table 3-8).

Nonparametric correlational analyses supported the results of the Pearson Product-Moment correlation in suggesting that a positive relationship exists between perceived level and commitment to task-goals. The Spearman test resulted in a rho of .3711 significant at the .001 level (Table 3-10), and the Kendall test produced a tau of .2815, significant also at the .001 level (Table 3-9).

Of the five goal characteristics studied, one, participation, evidenced a strong relationship to perceived organizational level. Commitment also displayed a relatively strong relationship to level, however, for reasons previously stated, firm conclusions were reserved. The remaining three goal characteristics, specificity, difficulty, and feedback appear to be equally important to organizational members regardless of their perceived level.

The overall instrument used to measure goal characteristics provides an effective measurement. However, some improvements in the instrument are required. Specific areas for improvement are addressed in the final section of this chapter.

Conclusions drawn from the results of the analyses and recommendations based on the results are presented in the following section.

Conclusions

As noted in Chapter I, this research effort was not designed to demonstrate or address causal relationships. A determination of the relationships between perceived organizational level and the various goal characteristics emerging from the factor analysis was proposed.

One clear point concerning organizational level emerged from the research; there is significant disparity between actual rank and perceived organizational level.

Comparison of Tables 3-2 and 3-6 illustrates this disparity. Although there was a large concentration of responses in the upper half of the perceived level scale, by actual rank, only a small portion of the survey subjects occupied upper-level positions.

A great deal of speculation may be done about the relationship demonstrated between perceived organizational level and participation in goal setting. The positive relationship indicates that as the individual perceives himself at higher and higher levels within his organization, participation becomes increasingly important. Implied by this relationship is the idea that emphasis on joint participation by employees throughout an organization is not necessarily beneficial. Some who consider themselves at very low levels may simply not be interested in participating. Pressure to have such individuals join in the process of setting the organization goals could feasibly retard the process and degrade the effectiveness of group effort in deciding on the goals. Another effect of forced participation could be decreased quality of the goals established.

The converse of the above situation has equally important implications. It seems logical that as individuals are encouraged more and more to participate in setting goals for their organization, they will consider themselves a more vital part of the organization and

perceptions they have about their place in the organization will elevate to higher levels. As suggested by Patchen (1970), a strong sense of shared purpose with the organization's leadership is developed.

Conclusions drawn from the indicated relationship between perceived level and individual emphasis on goal setting participation impact current management and goal theory.

In goal oriented management programs such as MBO, individual participation is highly emphasized. Results of this research suggest that across-the-board emphasis on participation may not be as productive as current goal theory assumes. Identifying individuals who perceive their level as high in their organization, and, for them, emphasizing participation while exerting effort to elevate the perceptions the other employees have of their organizational level may be a more effective approach for managers to take than the approach now used in which emphasis is placed on getting participation from all employees.

Results of this research indicate that there is no significant relationship between perceived organizational level and goal difficulty. The researchers do not consider the results as negating the importance of challenging, difficult goals. To the contrary, the concept of establishing moderately difficult goals for all employees appears valid. The degree of difficulty designed into

goals should not be dependent upon the various levels within an organization.

As noted in Chapter I, feedback and specificity are also important aspects of goals and have received strong emphasis in modern goal theory discussions. Results of this research suggest that the importance of feedback is universal within an organization. There appears to be no advantage in stressing feedback more at certain organizational levels than at others. Rather, feedback should be equally emphasized at all levels within an organization. The concept of clear and specific goals also appears to be a viable organization-wide technique. Results of this research regarding feedback and goal specificity therefore are consistent with existing goal theory.

Recommendations

The results of this research and the conclusions based on those results cannot be considered the complete resolution to the overall problem identified in the introduction. However, knowledge regarding goal phenomena has been expanded. Recognition of the relationships exposed by this research should prompt continued research directed at providing the "hows" and "whys" of those relationships.

Summarizing the discussion section of this chapter, the researchers noted that improvements in the goal characteristics questionnaire are required. Three specific areas of improvement are recommended.

Greater depth is needed in the commitment measurement. The number of questionnaire items used to measure commitment should be increased.

In some cases, as in item 16, statements have dual meanings. Elimination of words which create this inconsistency of interpretation is necessary.

The instrument intended to measure goal acceptance is inadequate, and did not result in identifiable factoring of the acceptance items. Work is required to develop a reliable instrument for measuring this particular goal characteristic.

The questionnaire items used to measure goal participation, feedback, goal difficulty, and goal specificity replicated Steers' research results in demonstrating ability to measure each of the respective goal characteristics. They are apparently valuable tools for use in future research.

To better understand the full meaning of the relationship between perceived level and participation in the goal setting process, causality must be determined. Longitudinal studies are needed to determine which, if any, causal effects exist. The researchers also recommend that a future research effort be made to compare, over time, assigned levels (official rank) with perceived level as participation and other goal characteristics are varied.

In order to generalize the findings of this research to a greater population, similar research is required in other than military organizations.

APPENDICES

APPENDIX A

WORK OBJECTIVES SURVEY

PURPOSE OF THIS SURVEY

This questionnaire is part of a research study of jobs and people's perceptions of their jobs. The research is being conducted by Captains Gerald E. McNair and Anton J. Price of the Air Force Institute of Technology's Graduate School of Systems and Logistics. The purpose of the research is to find out whether or not people in various types and levels of organizations view particular aspects of their jobs differently. We are interested in how you feel about these aspects of your job.

Please answer the questions on the following pages as honestly and candidly as possible. Indicate how you really feel about the subject. In no way will your responses be traceable to you as an individual nor will any attempt be made to do so. There are no "trick" questions.

Not only will this survey permit you to seriously consider your job and your feelings about it, but it will also give you a means of expressing your opinions without fear of reprisal. Information gathered in this survey may ultimately prove useful in improving conditions in your job.

Keep in mind that this is not a test and there are no "correct" or "incorrect" answers. We want your honest opinion.

There are a total of 64 items on this survey questionnaire. When you have completed the survey, please place the answer form in the pre-addressed envelope and forward it through "normal" distribution channels.

In advance, "thank you" for your participation in this study. It is by your cooperation that we hope to advance our understanding of the management process.

USAF SCN 77-116 (Expires 30 Sep 1977)

PLEASE READ THE FOLLOWING INSTRUCTIONS
BEFORE ANSWERING THE SURVEY

Answer the questions as of May 1977.

Select only one answer to each question.

Mark your answers on the answer sheet.

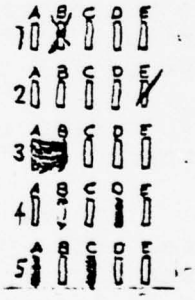
Be sure to mark your answers carefully so that you enter them opposite the same answer sheet number as survey question number.

Be sure that your answer marks are heavy and black and that you blacken the whole rectangle but stay within the rectangle lines. Do not use a ball point pen. Use a No. 2 pencil only.

RIGHT WAY
TO MARK
ANSWER SHEET



WRONG WAY
TO MARK
ANSWER SHEET



DO NOT ENTER YOUR SOCIAL SECURITY ACCOUNT NUMBER in the boxes indicated on the front of the answer sheet even though it says to do so. Do not sign the answer sheet or identify yourself as an individual in any way.

When you have completed the questions, please place your answer sheet in the pre-addressed envelope that has been provided and mail it as soon as possible through normal distribution channels. Your participation is voluntary.

Thank you for your cooperation in completing this research effort.

PART I

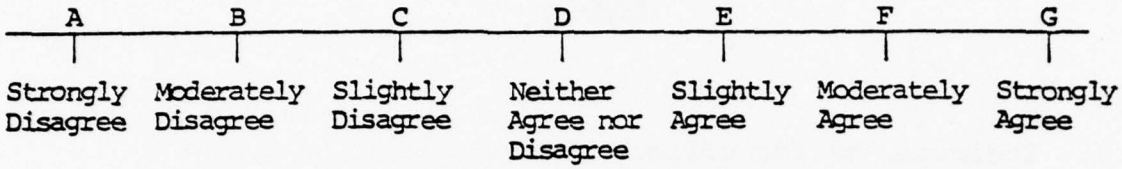
1. Indicate (a) for officer
(b) for enlisted

Of the following questions, answer question 2 if officer or question 3 if enlisted.

2. Indicate (a) for 0-1
(b) for 0-2
(c) for 0-3
(d) for 0-4
(e) for 0-5
(f) for 0-6
(g) for 0-7 and above

3. Indicate (a) for E-1
(b) for E-2
(c) for E-3
(d) for E-4
(e) for E-5
(f) for E-6
(g) for E-7
(h) for E-8
(i) for E-9

PART II



The seven-point scale above indicates various degrees of agreement. Select the alternatives which best describe your agreement with each of the following statements.

4. I give up easily if I can't reach the goal.

5. I should not have too much difficulty in reaching my work objectives.

6. I receive a considerable amount of feedback and guidance on the quality of output on the job.

7. I continue to work toward a goal even when it becomes difficult.

8. I accept the work objectives or goals for my job.

9. I am allowed a high degree of influence in the determination of my work objectives.

10. Most of my co-workers and peers try to out-perform each other on their assigned work goals.

11. My work objectives are very clear and specific; I know exactly what my job is.

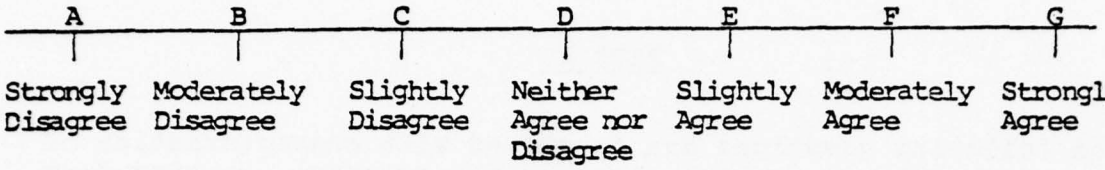
12. My work objectives will require a great deal of effort from me to complete them.

13. I really have little voice in the formulation of my work objectives.

14. I do not try to meet the goals established for this job.

15. I will work toward some goal for a long time before giving up.

16. I accept the specific goals or standards set for my job.



17. I think my work objectives are ambiguous and unclear.

18. It will take a high degree of skill and know-how on my part to attain fully my work objectives.

19. The setting of my work goals is pretty much under my own control.

20. My boss seldom lets me know how well I am doing on my work toward my work objectives.

21. There is a very competitive atmosphere among my peers and I with regard to attaining our respective work goals; we all want to do better in attaining our goals than anyone else.

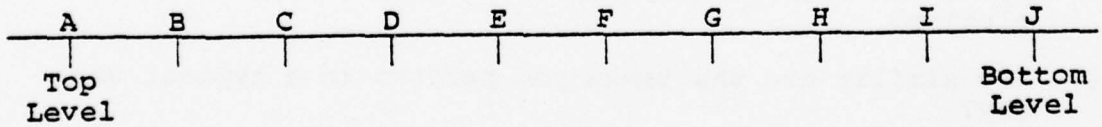
22. I am provided with a great deal of feedback and guidance on the quality of my work.

23. I understand fully which of my work objectives are more important than others; I have a clear sense of priorities on these goals.

24. My work objectives are quite difficult to attain.

25. My supervisor usually asks for my opinions and thoughts when determining my work objectives.

PART III



26. Consider the above scale as representative of the top, bottom, and all interim work levels within the organization to which you are assigned. In your opinion, at which level do you work? Mark the appropriate letter on the response form.

PART IV

The following questions are concerned with characteristics of your job. Please mark the appropriate response, ranging from "very little" to "very much."

(a) Very Little
(b) Little
(c) Moderate Amount
(d) Quite a Bit
(e) Very Much

27. How much variety is there in your job?

28. How much are you left on your own to do your own work?

29. To what extent do you do a "whole" piece of work (as opposed to doing part of a job which is finished by some other employee)?

30. How repetitious are your duties?

31. To what extent do you find out how well you are doing on the job as you are working?

32. To what extent do you have the opportunity to talk informally with other employees while at work?

33. To what extent is dealing with other people a part of your job?

34. How much of your job depends upon your ability to work with others?

35. How often do you see projects or jobs through to completion?

36. How similar are the tasks you perform in a typical work day?

37. To what extent are you able to do your job indepedent of others?

38. To what extent are you able to act independently of your supervisor in performing your job function?

Following are a number of statements describing job characteristics. Please indicate how much the characteristic is actually present in your job by marking the appropriate response, ranging from "a minimum amount" to "a maximum amount."

(a) A Minimum Amount
(b) A Little
(c) A Moderate Amount
(d) Quite a Bit
(e) A Maximum Amount

39. The opportunity to do a number of different things.

40. The opportunity for independent thought and action.

41. The opportunity to do a job from the beginning to end (i.e., the chance to do a whole job).

42. The opportunity to find out how well I am doing in my job.

43. The opportunity to talk to others on my job.

44. The opportunity in my job to get to know other people.

45. The amount of variety in my job.

46. The freedom to do pretty much what I want on my job.

47. The opportunity to complete work I start.

48. The feeling that I know whether I am performing my job well or poorly.

49. The opportunity to develop close friendships in my job.

Following are a number of questions asking for your feelings about your present job. Mark the appropriate response.

50. Which one of the following shows how much of the time you feel satisfied with your job?

(a) Never
(b) Seldom
(c) Occasionally
(d) About half of the time
(e) A good deal of the time
(f) Most of the time
(g) All of the time

51. Choose one of the following statements which best tells how well you like your job.

(a) I hate it
(b) I dislike it
(c) I don't like it
(d) I am indifferent to it
(e) I like it
(f) I am enthusiastic about it
(g) I love it

52. Which one of the following best tells how you feel about changing your job?

(a) I would quit this job at once if I could.
(b) I would take almost any other job in which I could earn as much as I am earning now.
(c) I would like to change both my job and my occupation.
(d) I would like to exchange my present job for another one.
(e) I am not eager to change my job, but I would do so if I could get a better job.
(f) I cannot think of any job for which I would exchange.
(g) I would not exchange my job for any other.

53. Which one of the following shows how you think you compare with other people?

(a) No one dislikes his job more than I dislike mine.
(b) I dislike my job much more than most people dislike theirs.
(c) I dislike my job more than most people dislike theirs.
(d) I like my job about as well as most people like theirs.
(e) I like my job better than most people like theirs.
(f) I like my job much better than most people like theirs.
(g) No one likes his job better than I like mine.

54. Do you feel that the Management by Objectives program is effective?

(a) Never heard of Management by Objectives..
(b) It's a paperwork program.
(c) Not used in my work area.
(d) I have heard of the program but don't know if it is effective.
(e) It appears to be effective.
(f) Very effective.

PART V

Each person produces something in his work. It may be a "product" or a "service." Sometimes it is difficult to identify the product or service. Listed below are some of the products or services produced in ATC.

equipment calibrated	jobs planned
pages typed	reports compleced
technical assistance	supplies ordered
weapons loaded	wiring installed
engines replaced	food prepared
transportation provided	pay vouchers checked
vehicles maintained	training given
quality control checks	fire protection

Please think carefully about the things you produce in your work and of the things produced by those people in your work group (everyone who works for your boss). Answer each question on the answer sheet.

55. Thinking of the various things produced by the people you know <u>in your work group</u>, how <u>much</u> are they producing?

    (a) Their production is very high
    (b) It is fairly high
    (c) It is neither high nor low
    (d) It is fairly low
    (e) It is very low

56. How good would you say is the <u>quality</u> of the products or services produced by the people you know <u>in your work group</u>?

    (a) Their products or services are of excellent quality
    (b) Good quality
    (c) Fair quality
    (d) Their quality is not too good
    (e) Their quality is poor

57. Do the people in your work group seem to maximize output from the resources (money, people, equipment, etc.) they have available? That is, how <u>efficiently</u> do they do their work?

    (a) They do not work efficiently at all
    (b) Not too efficient
    (c) Fairly efficient
    (d) They are very efficient
    (e) They are extremely efficient

PART VI

SUPPLEMENTARY INFORMATION

58. What is your sex?

(a) Female
(b) Male

59. Indicate your present job position.

(a) Supervisor
(b) Worker

60. Indicate age group.

(a) 17 years to 21 years
(b) Over 21 years to 26 years
(c) Over 26 years to 32 years
(d) Over 32 years to 40 years
(e) Over 40 years

61. Indicate years in service.

(a) Less than 2 years
(b) Over 2 years to 4 years
(c) Over 4 years to 8 years
(d) Over 8 years to 12 years
(e) Over 12 years to 16 years
(f) Over 16 years to 20 years
(g) Over 20 years

62. Indicate years assigned to present organization

(a) Less than 6 months
(b) 6 months to 1 year
(c) 1 year to 2 years
(d) 2 years to 3 years
(e) 3 years to 4 years
(f) 4 years to 5 years
(g) Over 5 years

63. Are you the reporting official for anyone in your organization? (Officer Effectiveness Reports, Airman Performance Reports, and/or Civilian Performance Appraisals)

(a) Yes
(b) No

64. Indicate the response which best describes your present organization.

(a) A unit of Headquarters ATC
(b) A unit of a Flying Training Wing
(c) A unit of a Technical Training Center
(d) Other

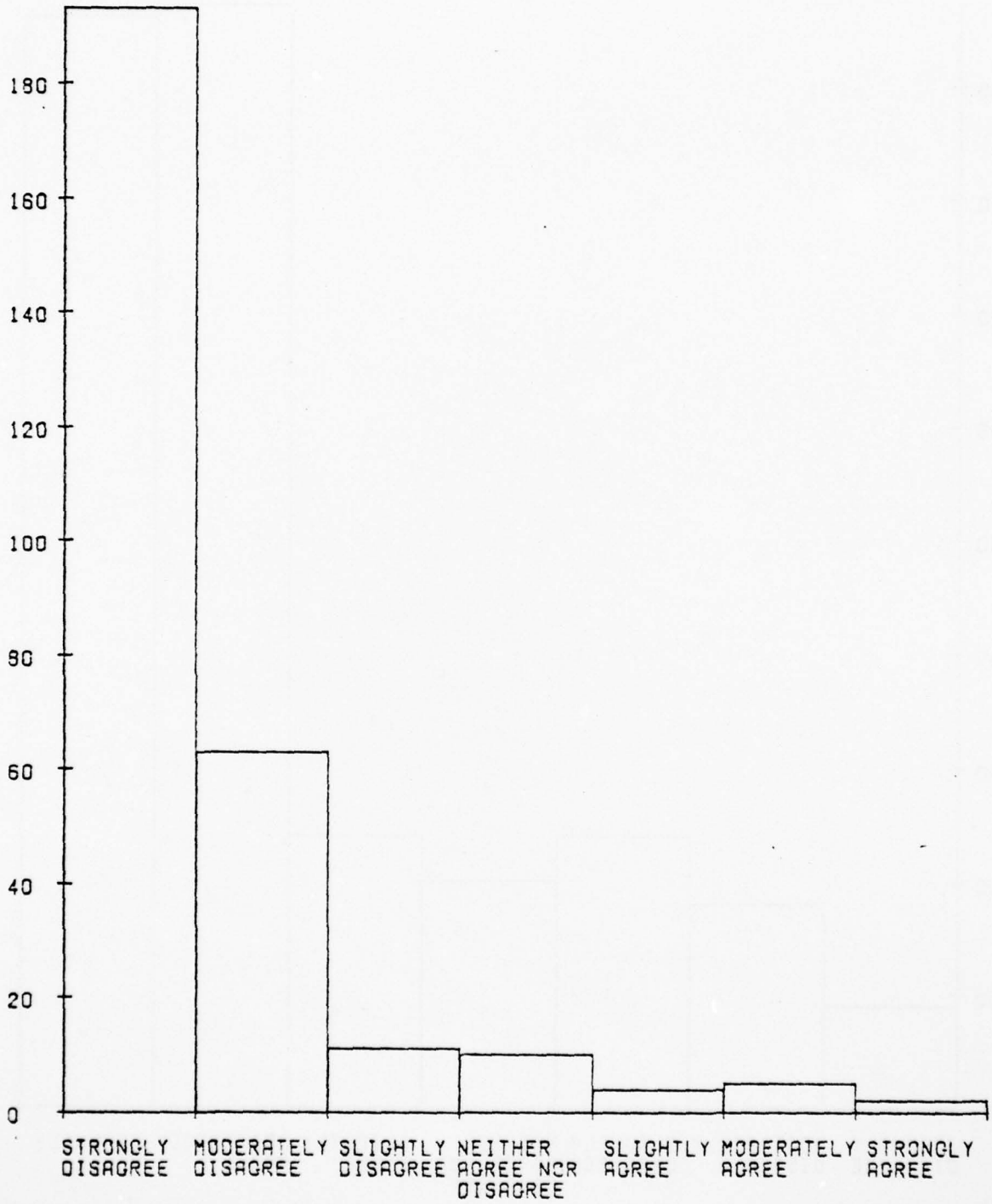
There are 64 items on this questionnaire of which you should have responded to 63 (either item 2 or item 3 should be left blank depending on officer or enlisted status). Please insure that your responses have been properly recorded on the answer form and that there are no stray or erroneous marks.

Please the completed answer form (PLEASE DO NOT FOLD) in the pre-addressed envelope provided and return through normal distribution channels.

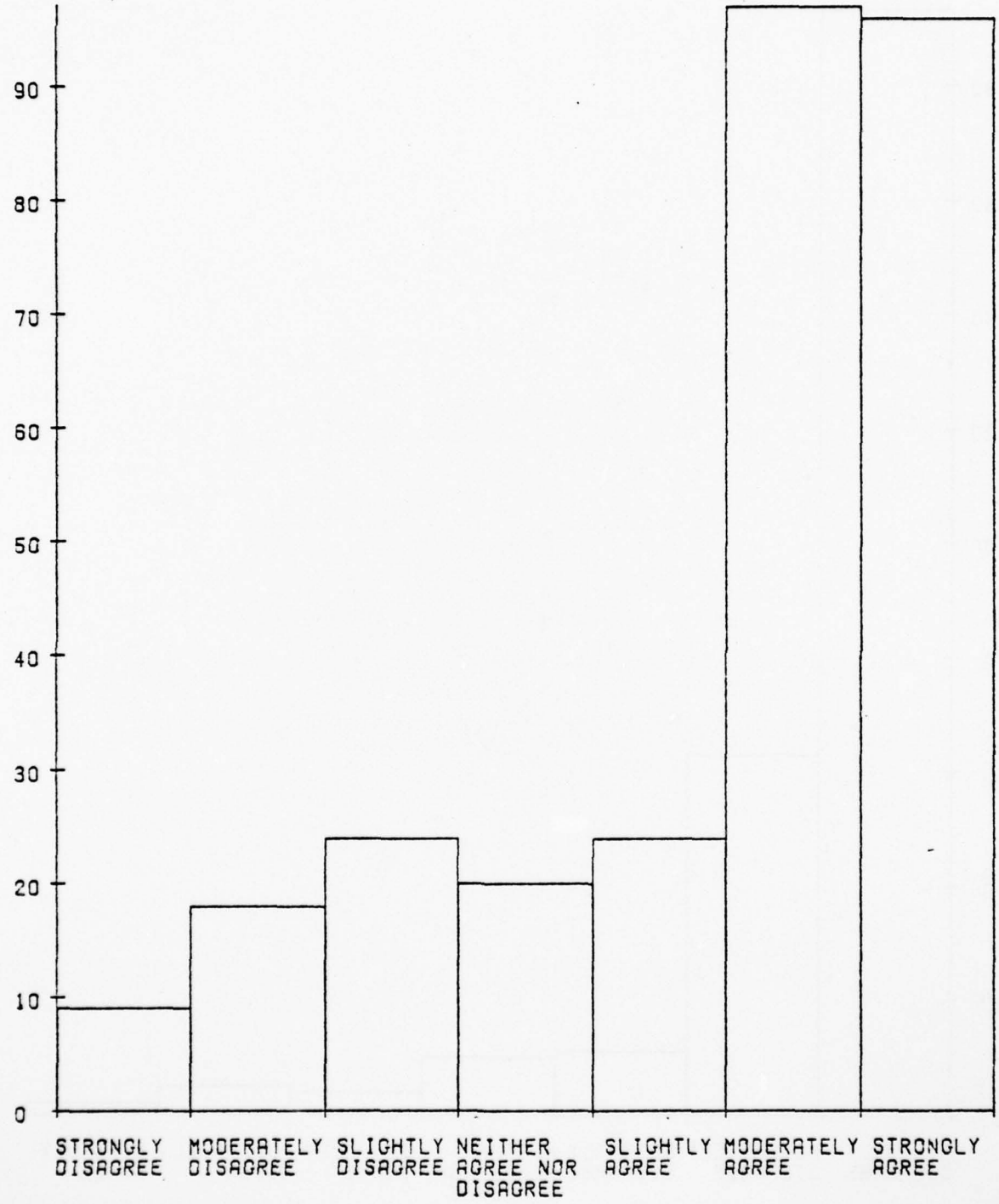
Again, thank you for your cooperation.

APPENDIX B

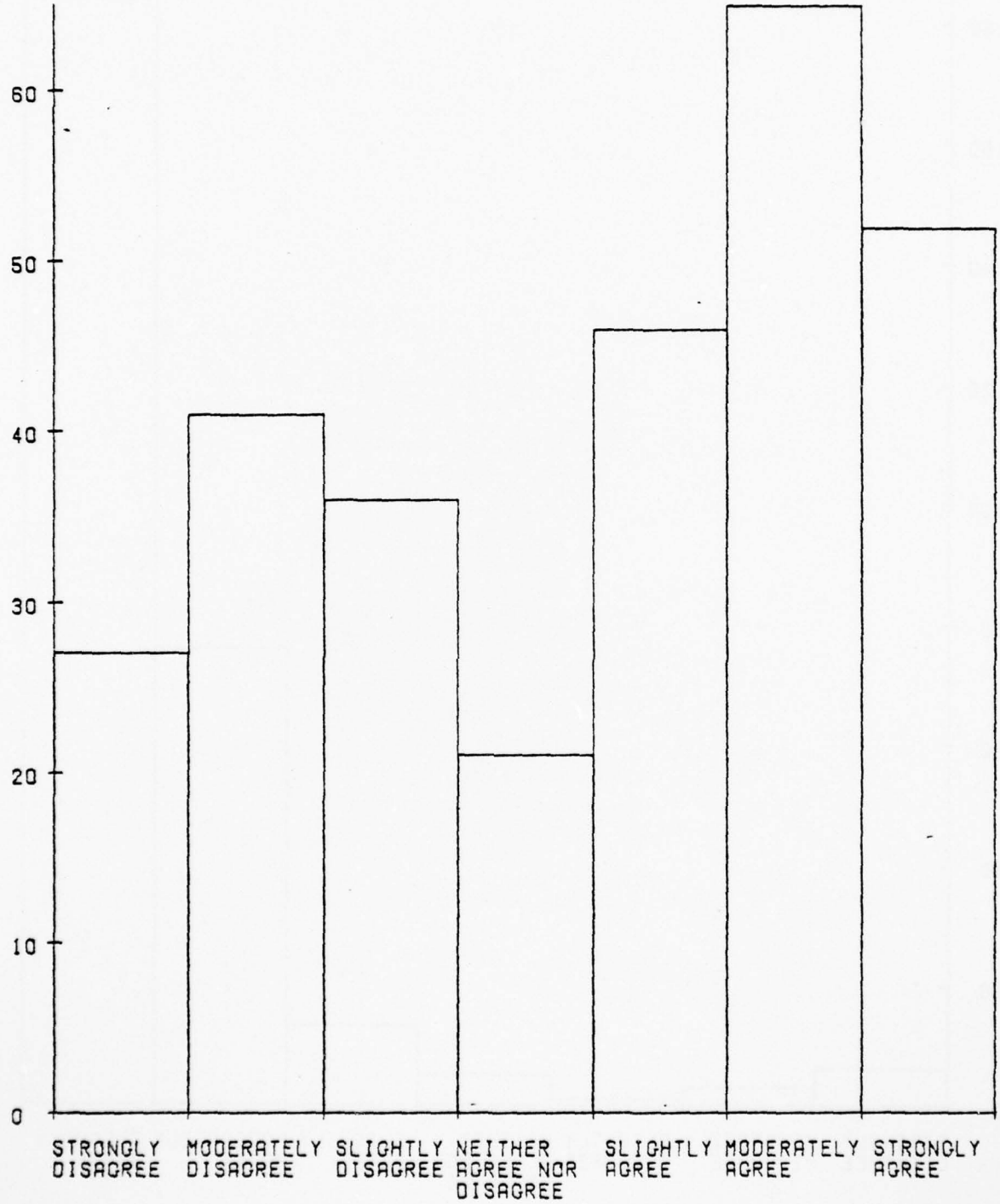
DISTRIBUTION OF RESPONSES
(GOAL QUESTIONNAIRE)



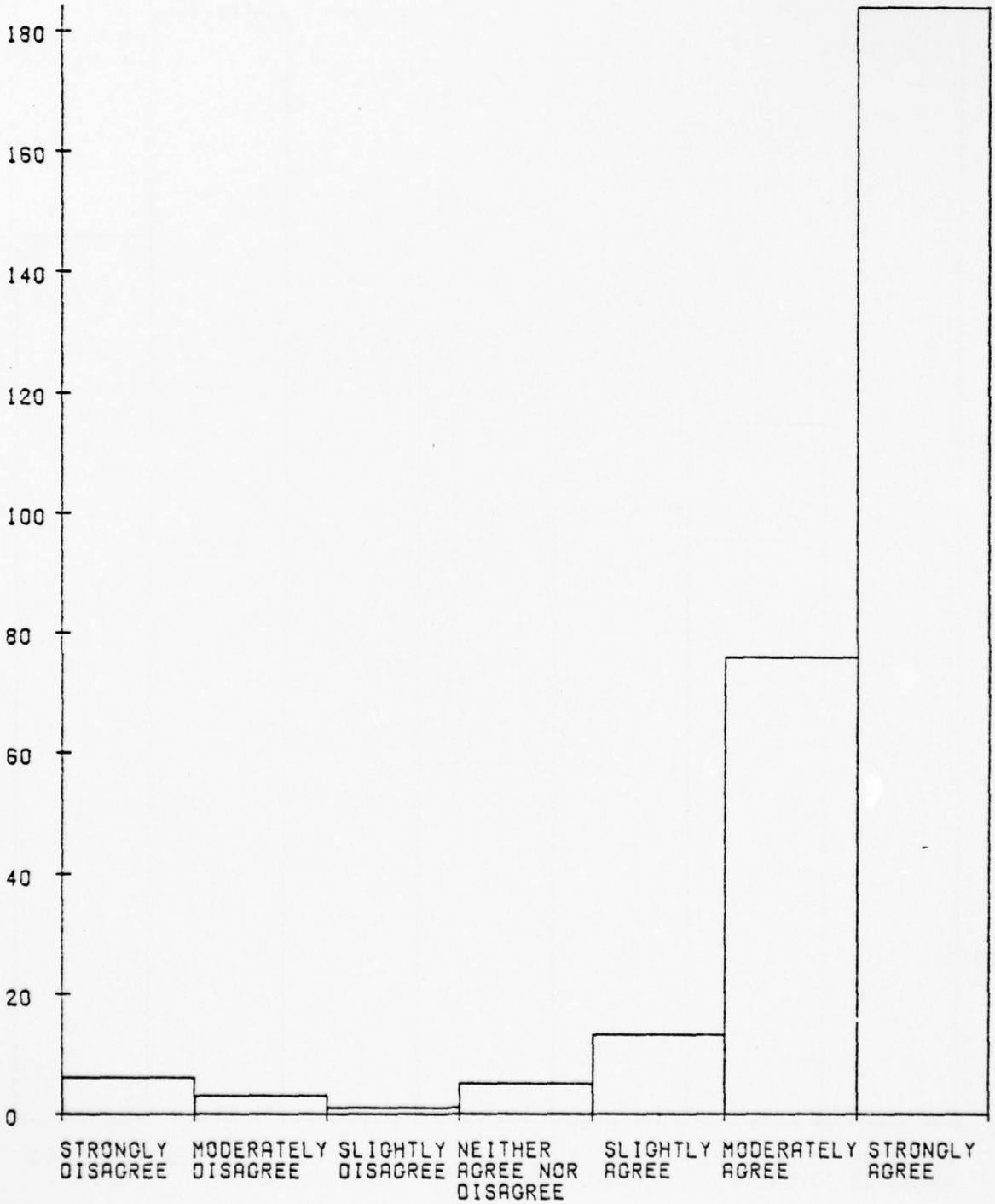
4. I GIVE UP EASILY IF I CAN'T REACH THE GOAL.



5. I SHOULD NOT HAVE TOO MUCH DIFFICULTY IN REACHING MY WORK OBJECTIVES.



6. I RECEIVE A CONSIDERABLE AMOUNT OF FEEDBACK AND GUIDANCE ON THE QUALITY OF OUTPUT ON THE JOB.

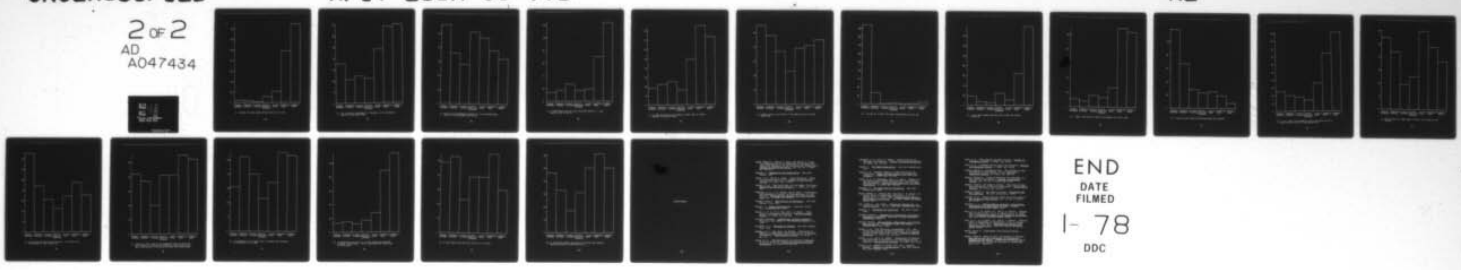


7. I CONTINUE TO WORK TOWARD A GOAL EVEN WHEN IT BECOMES DIFFICULT.

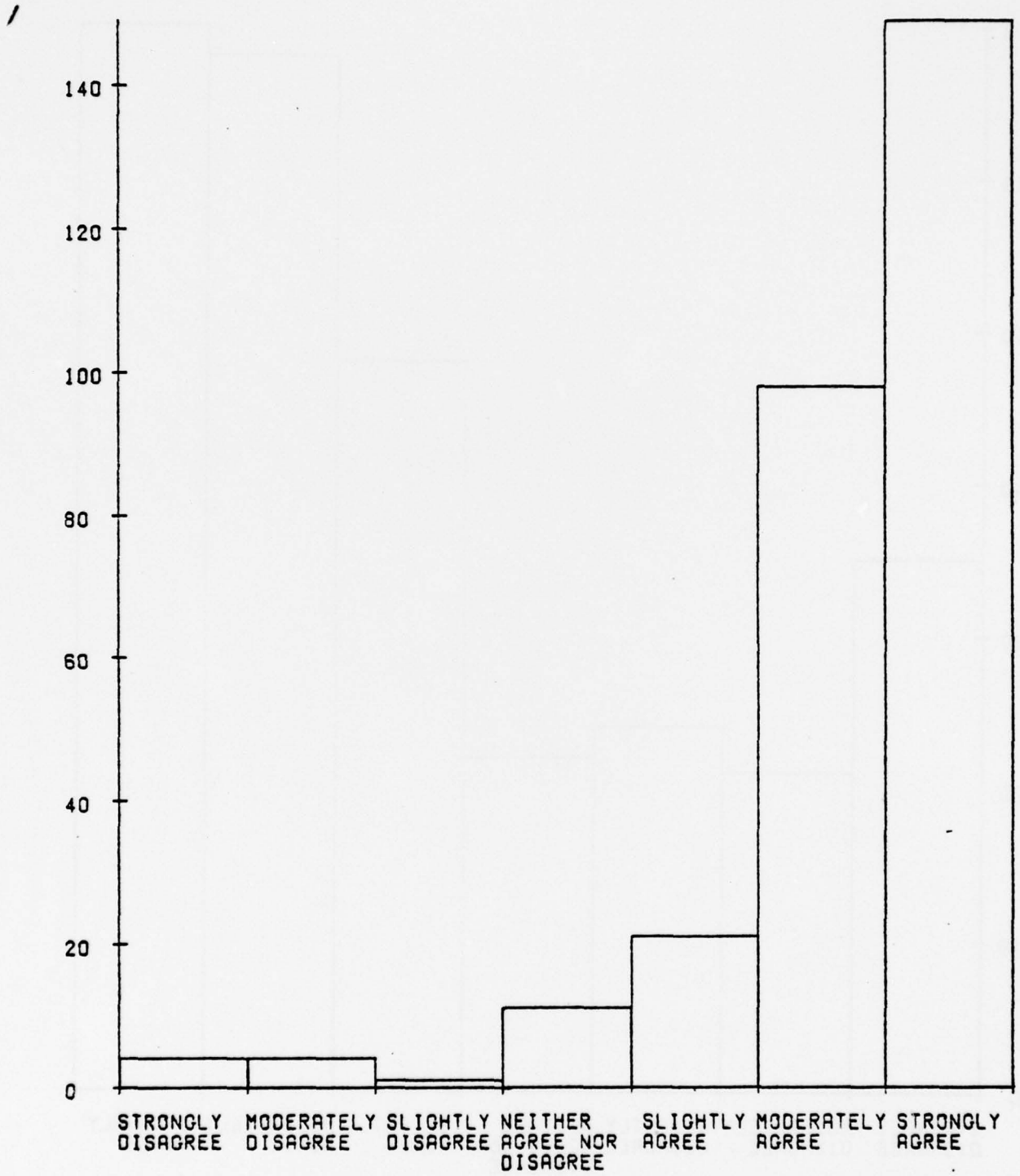
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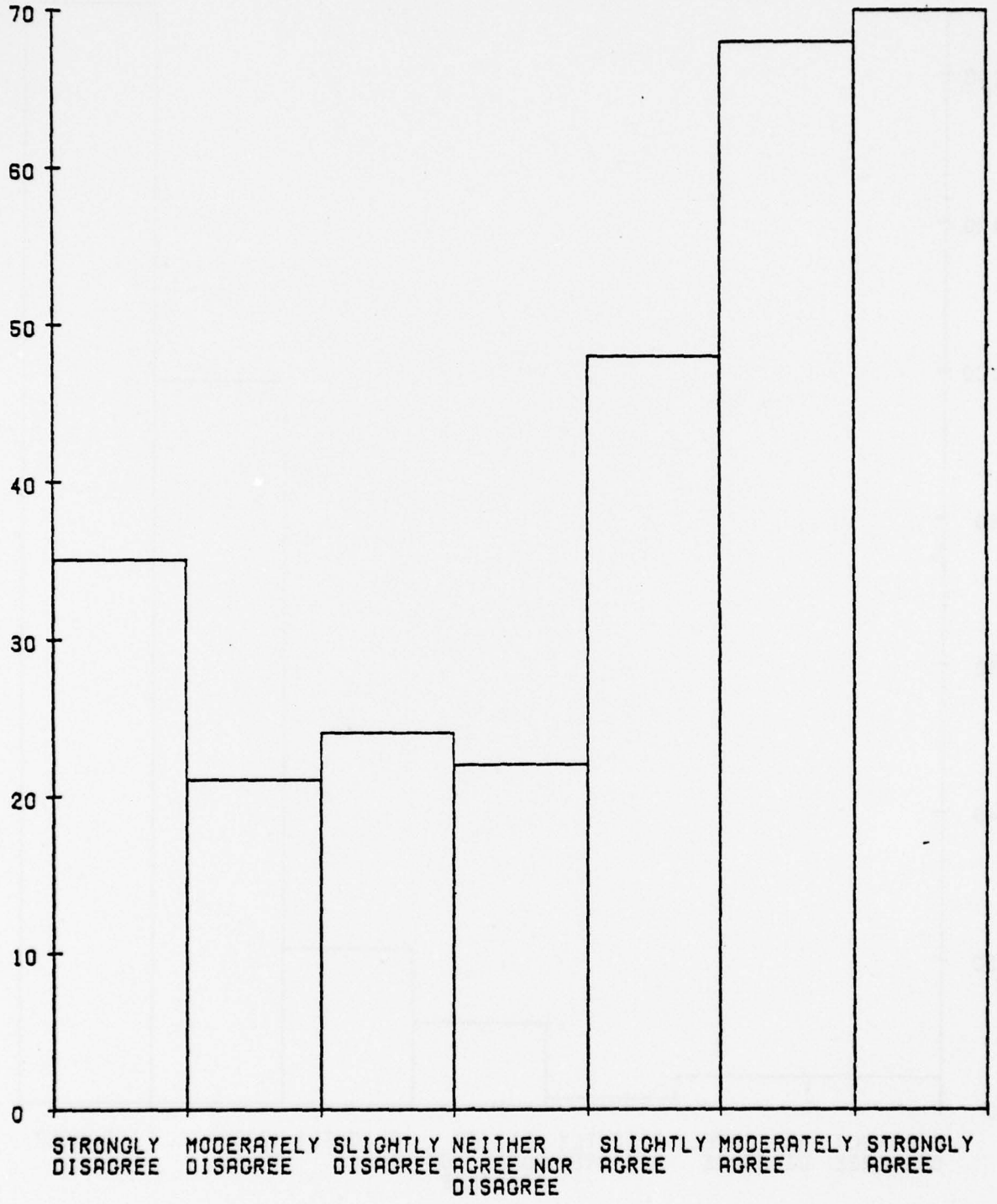
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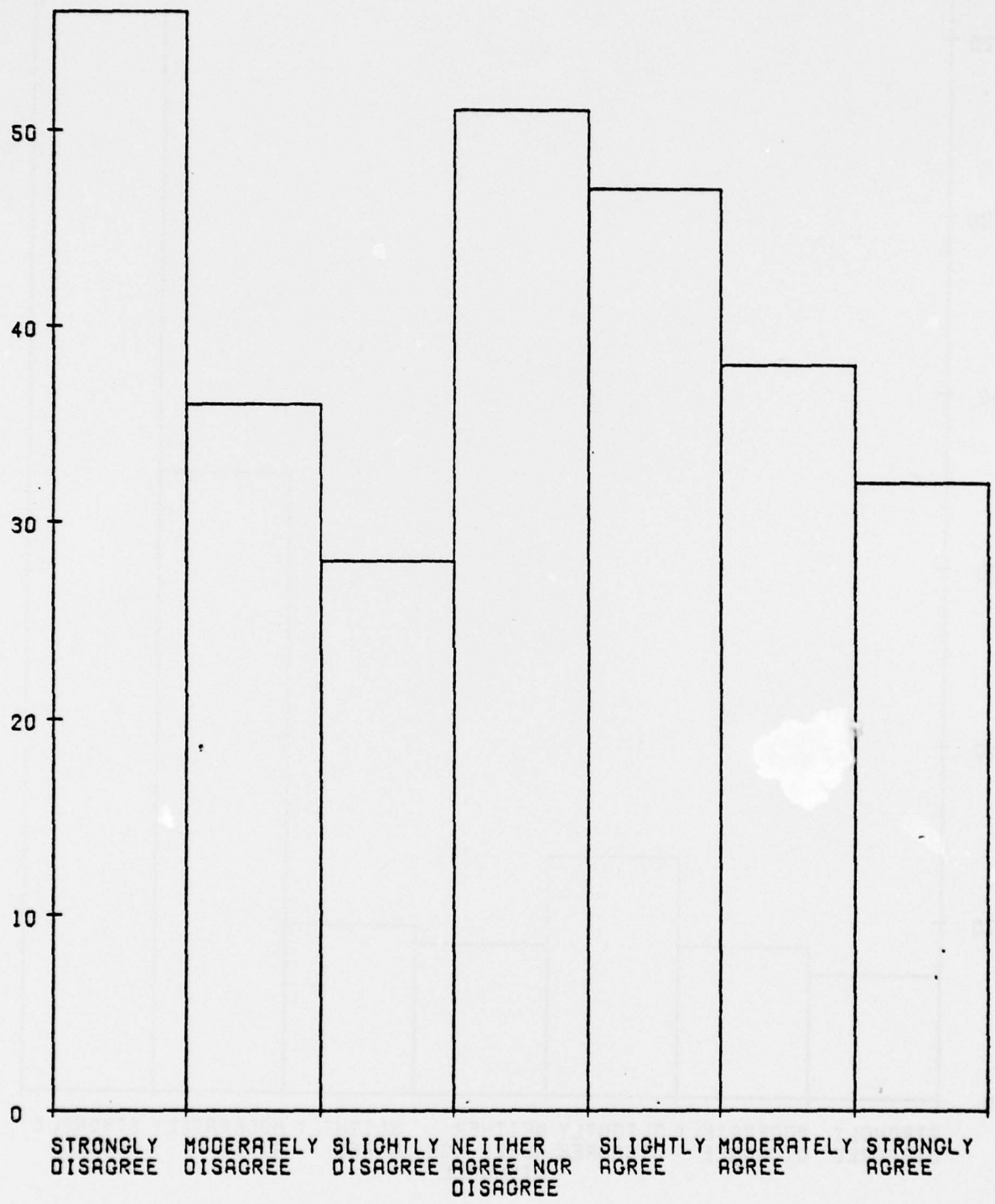
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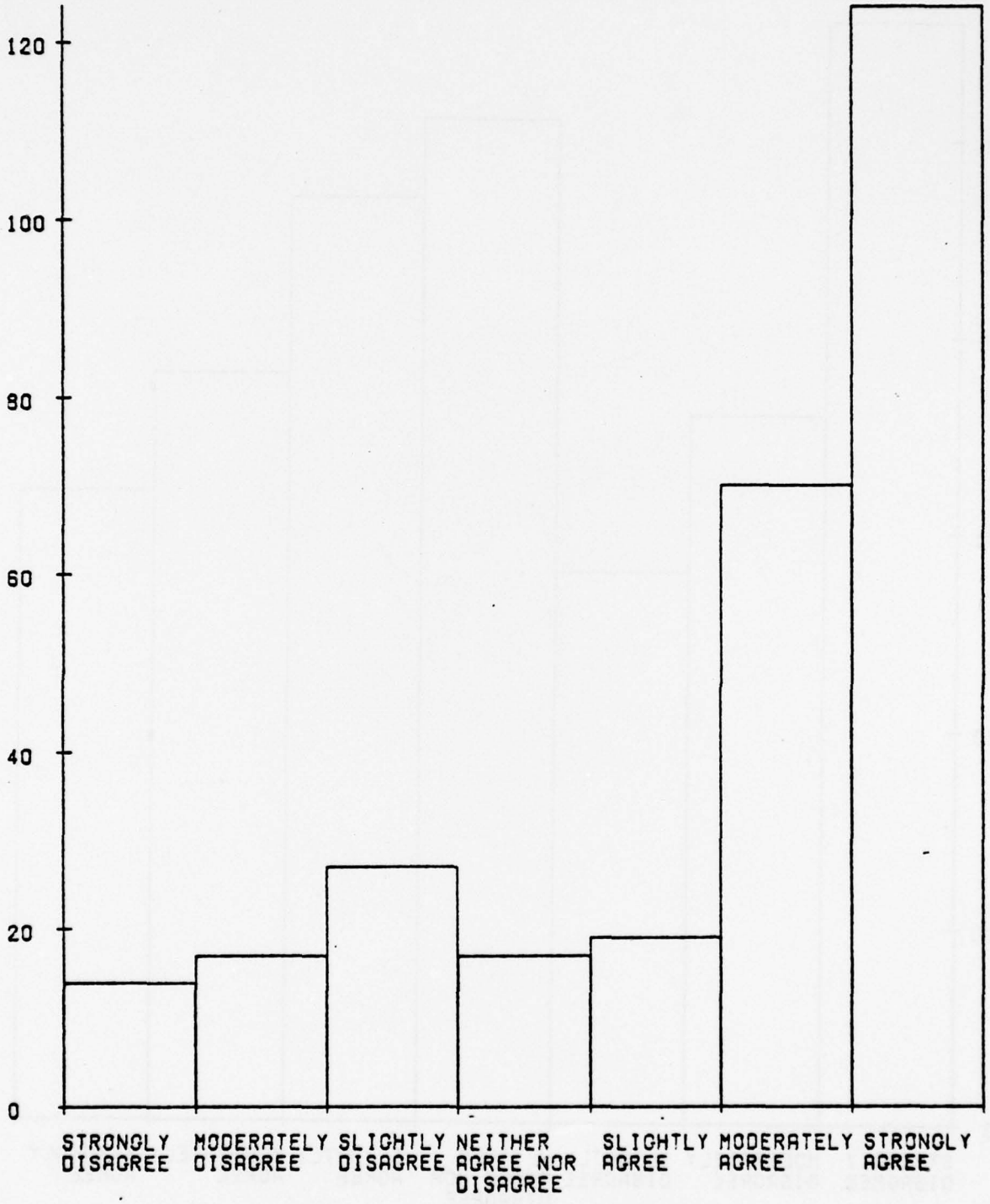
9. I ACCEPT THE WORK OBJECTIVES OR GOALS FOR MY JOB.



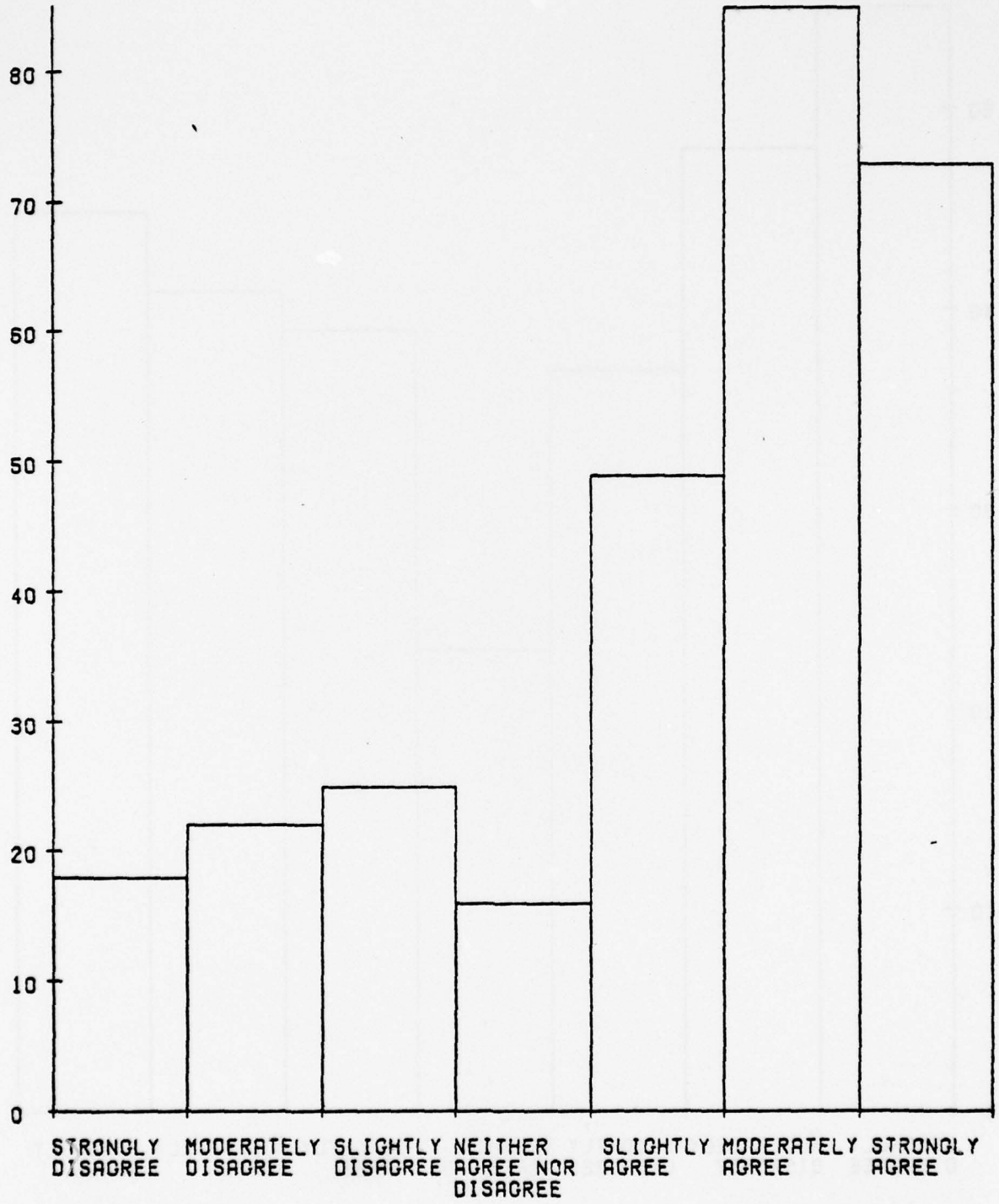
9. I AM ALLOWED A HIGH DEGREE OF INFLUENCE IN THE DETERMINATION OF MY WORK OBJECTIVES.



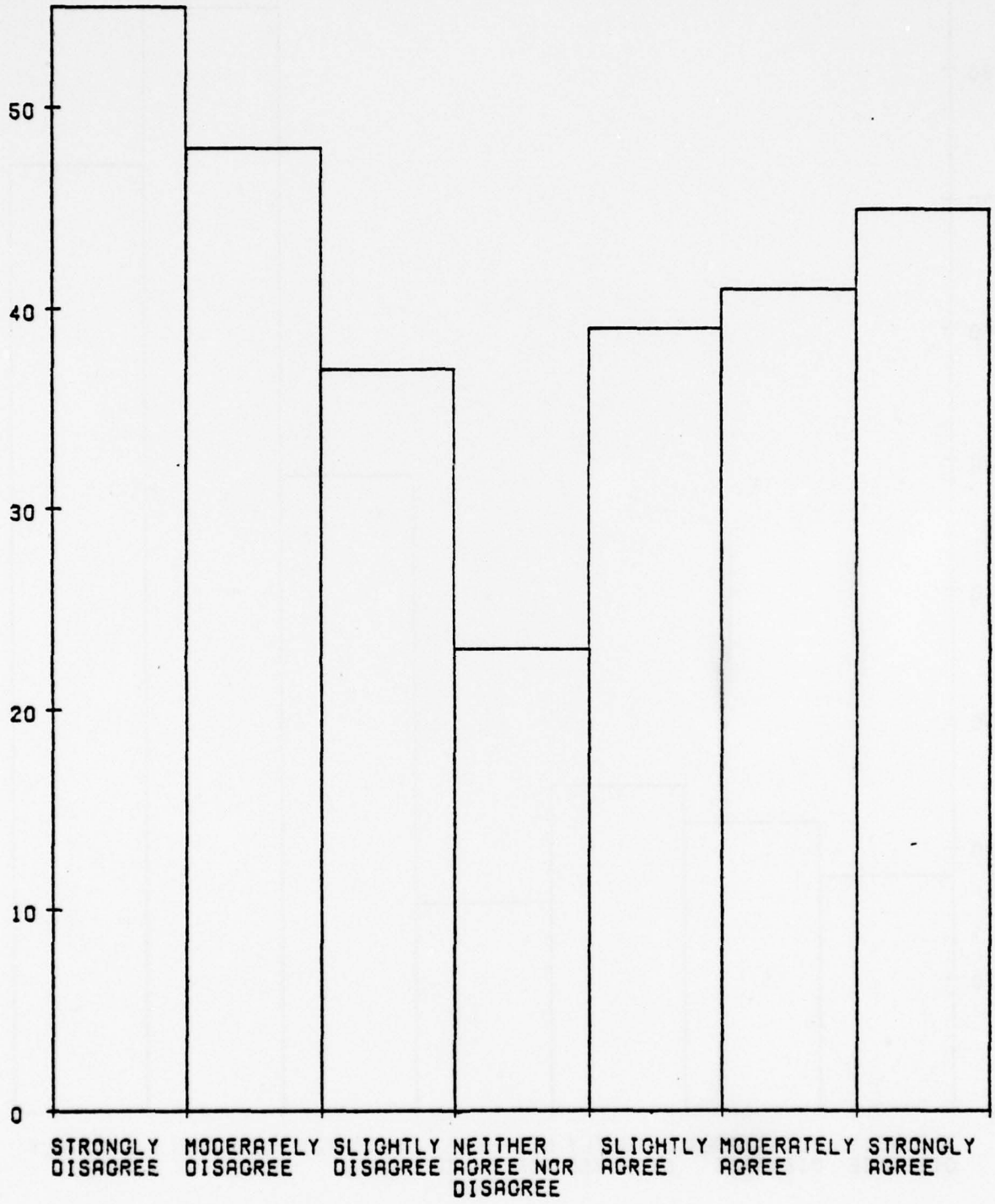
10. MOST OF MY CO-WORKERS AND PEERS TRY TO OUT-PERFORM EACH OTHER ON THEIR ASSIGNED WORK GOALS.



11. MY WORK OBJECTIVES ARE VERY CLEAR AND SPECIFIC: I KNOW EXACTLY WHAT MY JOB IS.



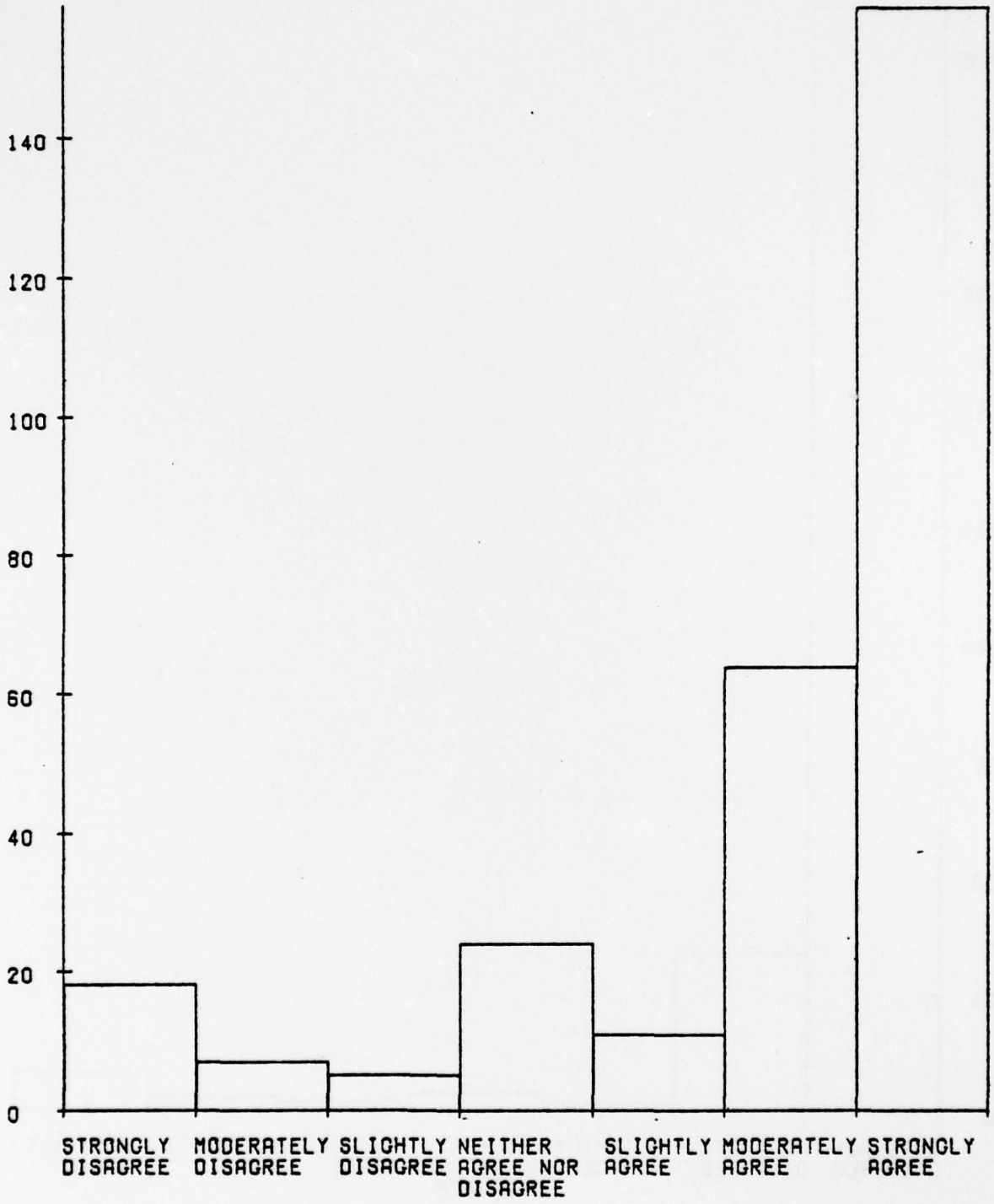
12. MY WORK OBJECTIVES WILL REQUIRE A GREAT DEAL OF EFFORT FROM ME TO COMPLETE THEM.



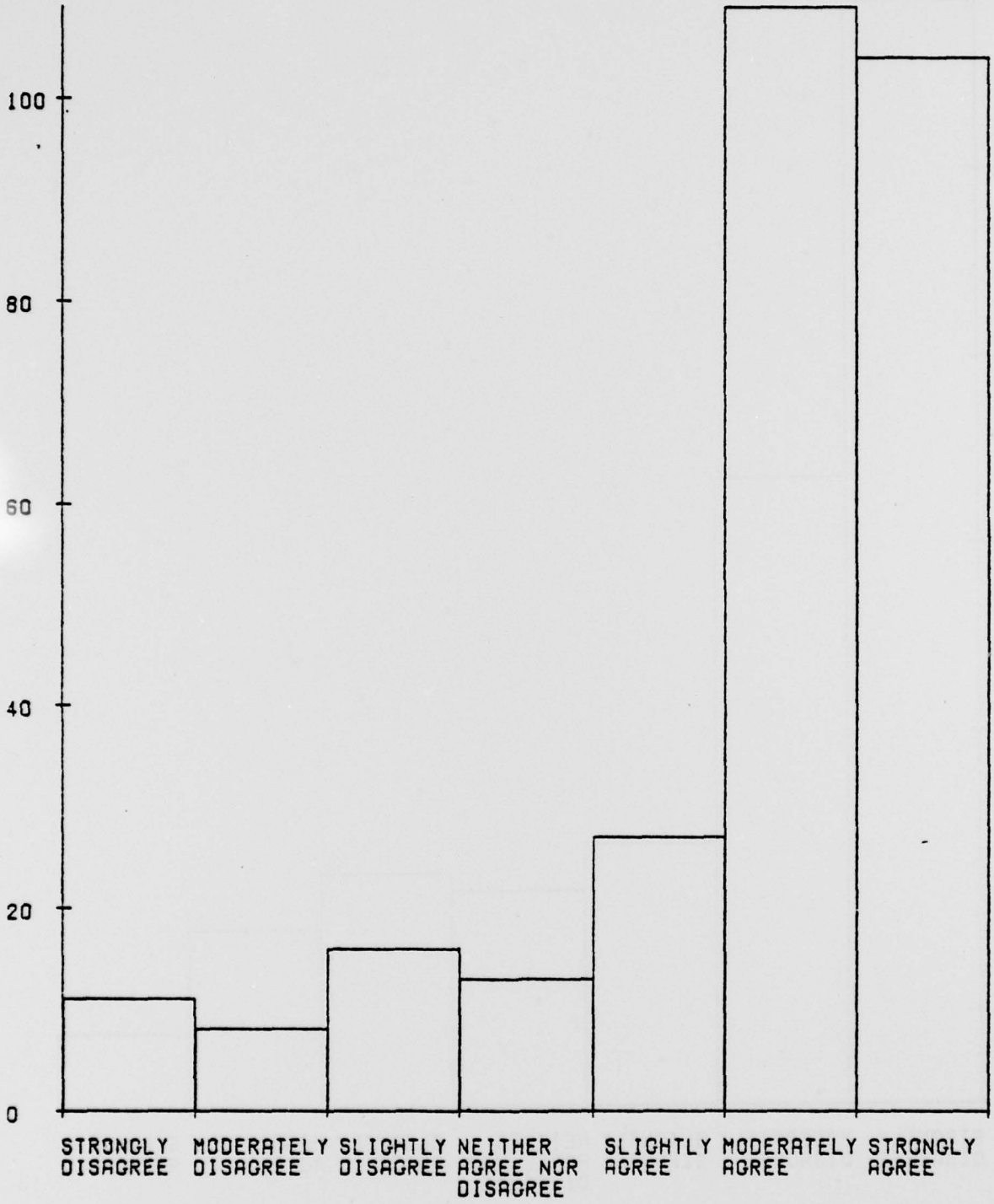
13. I REALLY HAVE LITTLE VOICE IN THE FORMULATION OF MY WORK OBJECTIVES.



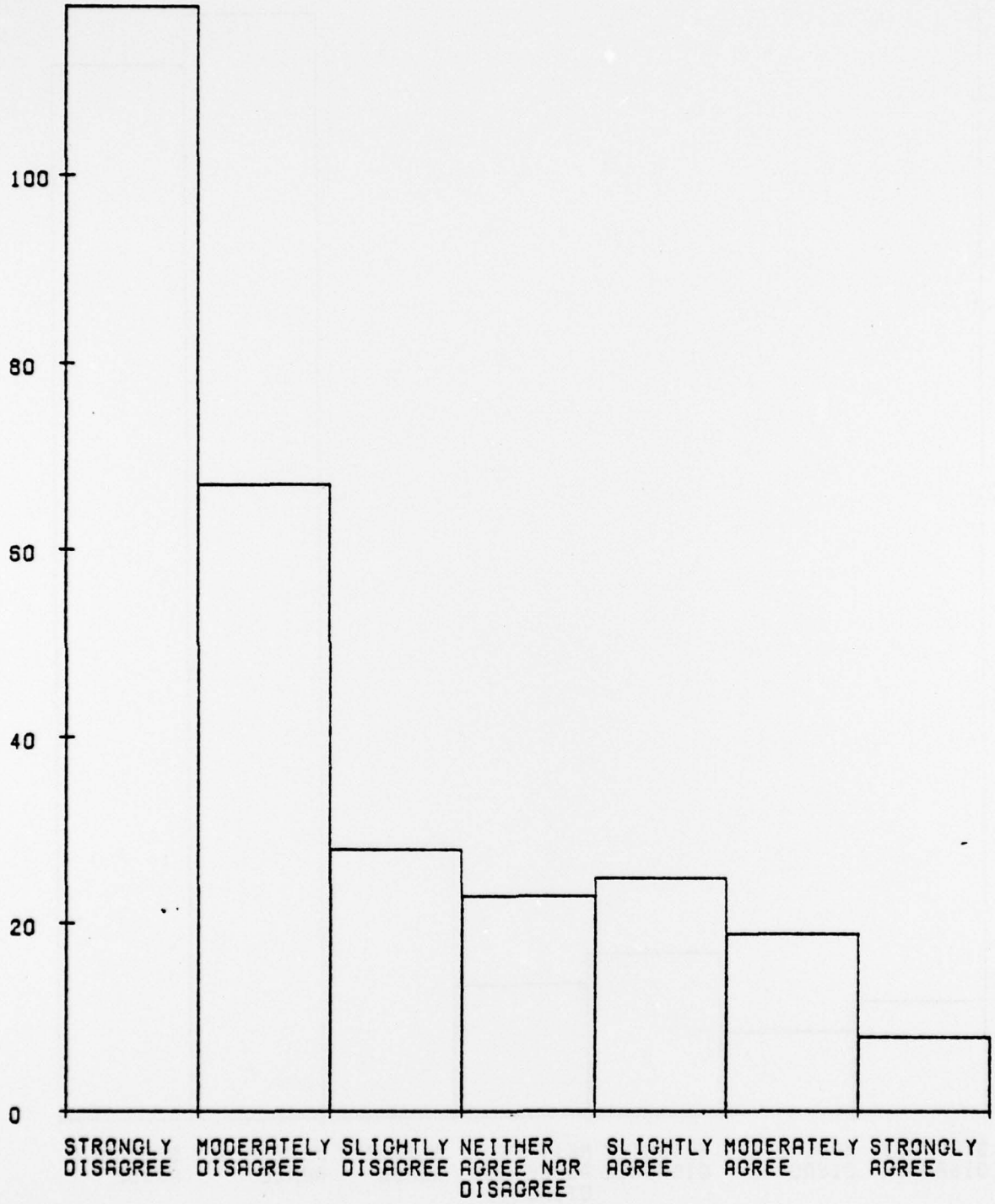
14. I DO NOT TRY TO MEET THE GOALS ESTABLISHED FOR THIS JOB.



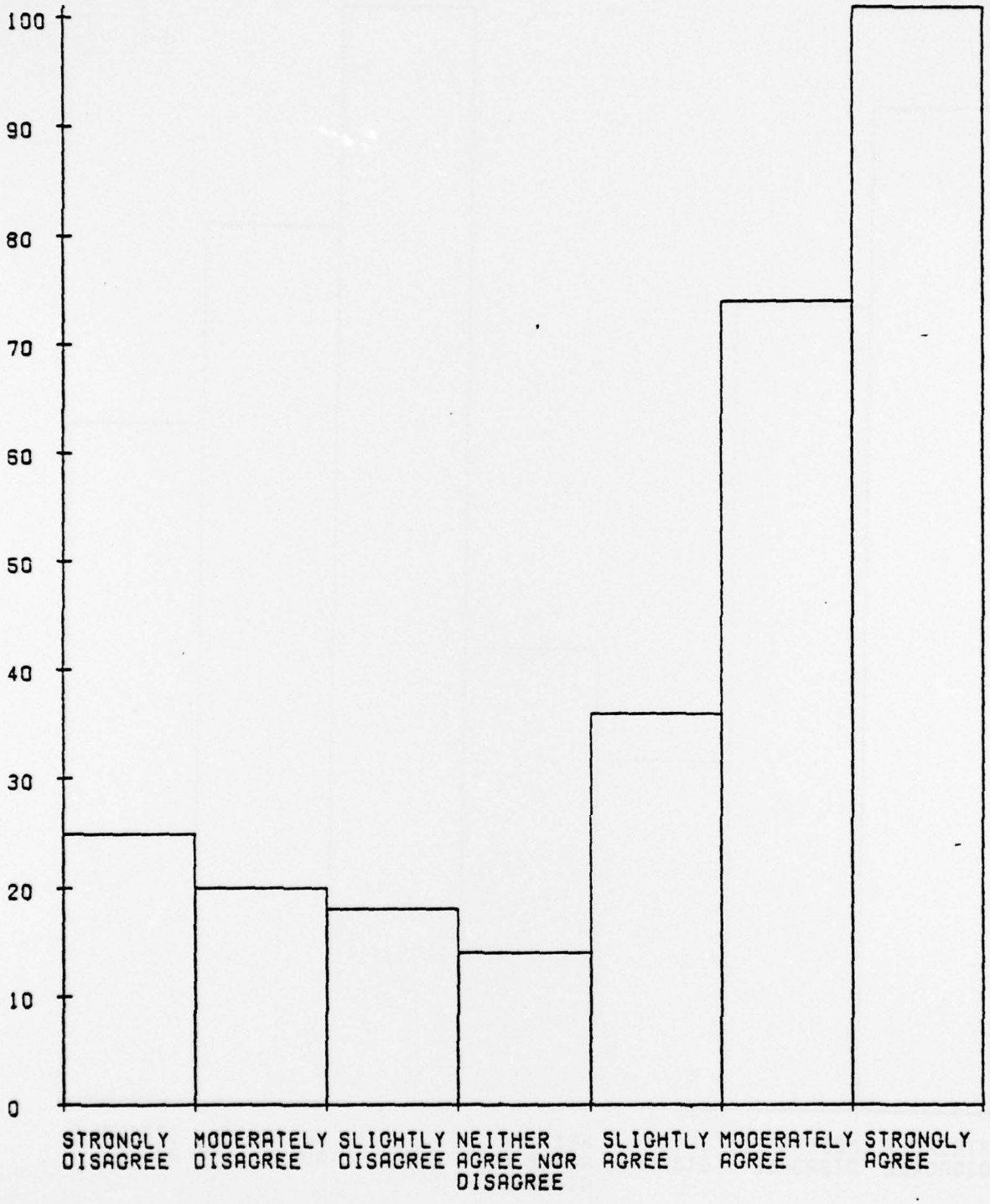
15. I WILL WORK TOWARD SOME GOAL FOR A LONG TIME BEFORE GIVING UP.



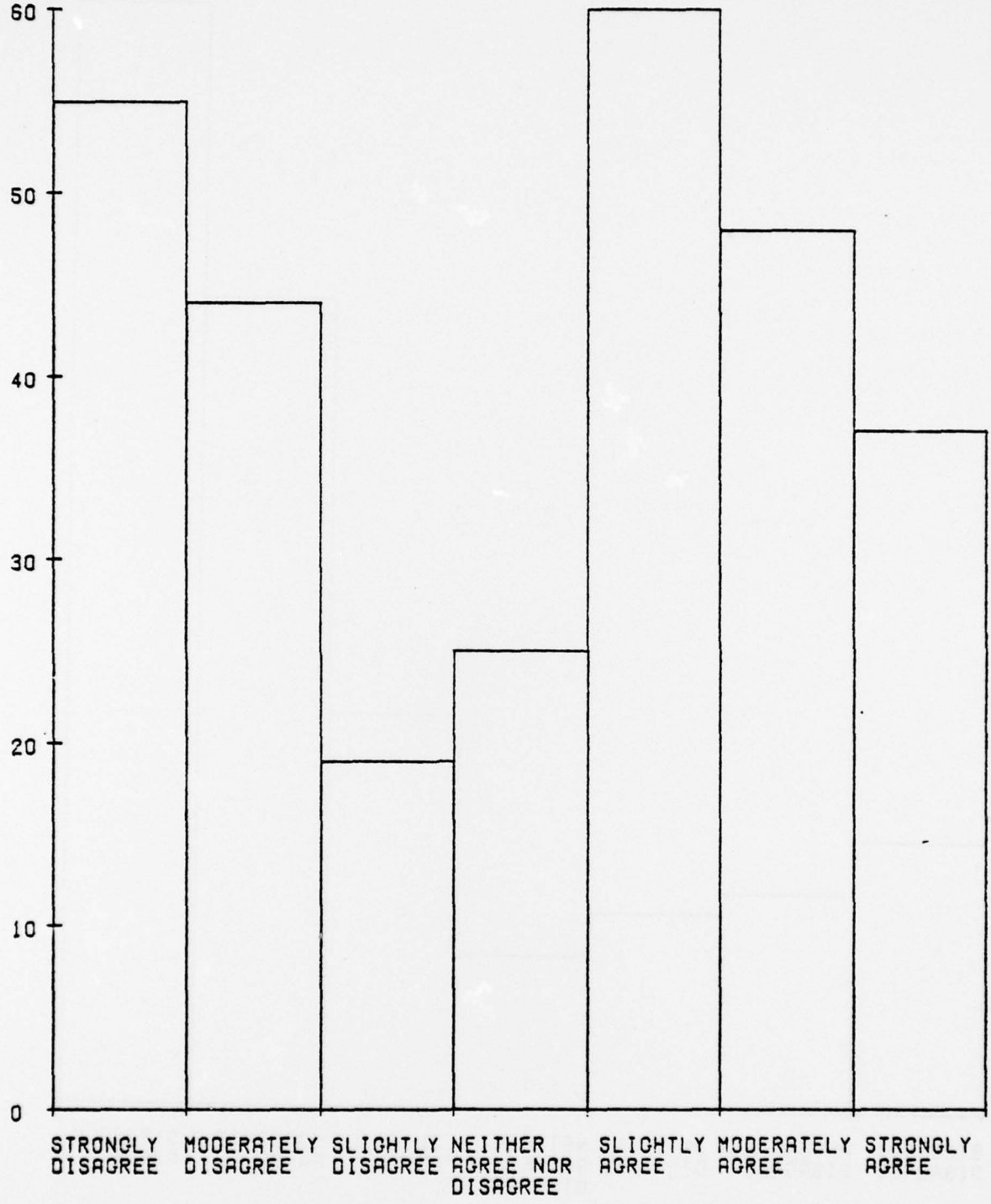
16. I ACCEPT THE SPECIFIC GOALS OR STANDARDS SET FOR MY JOB.



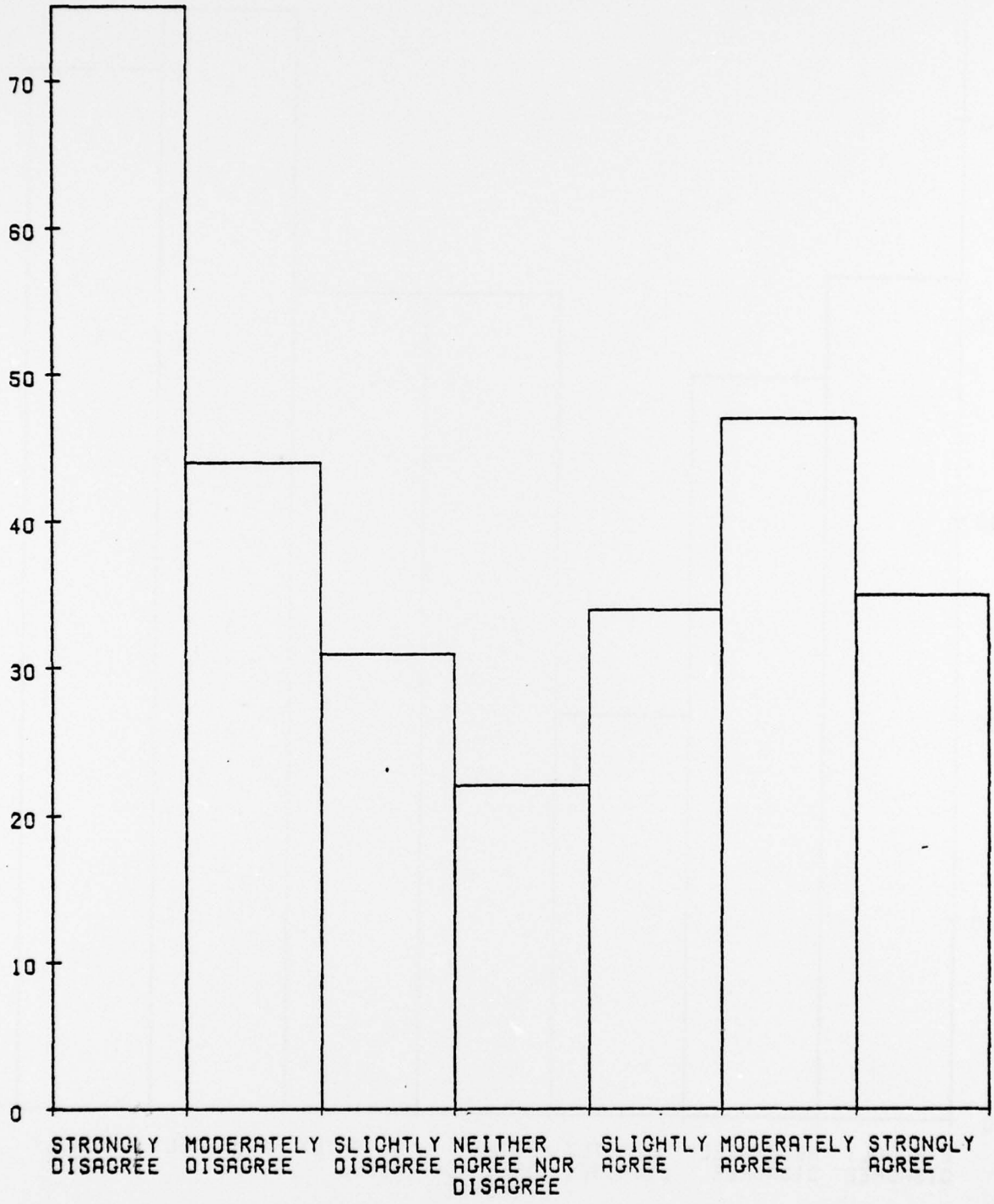
17. I THINK MY WORK OBJECTIVES ARE AMBIGUOUS AND UNCLEAR.



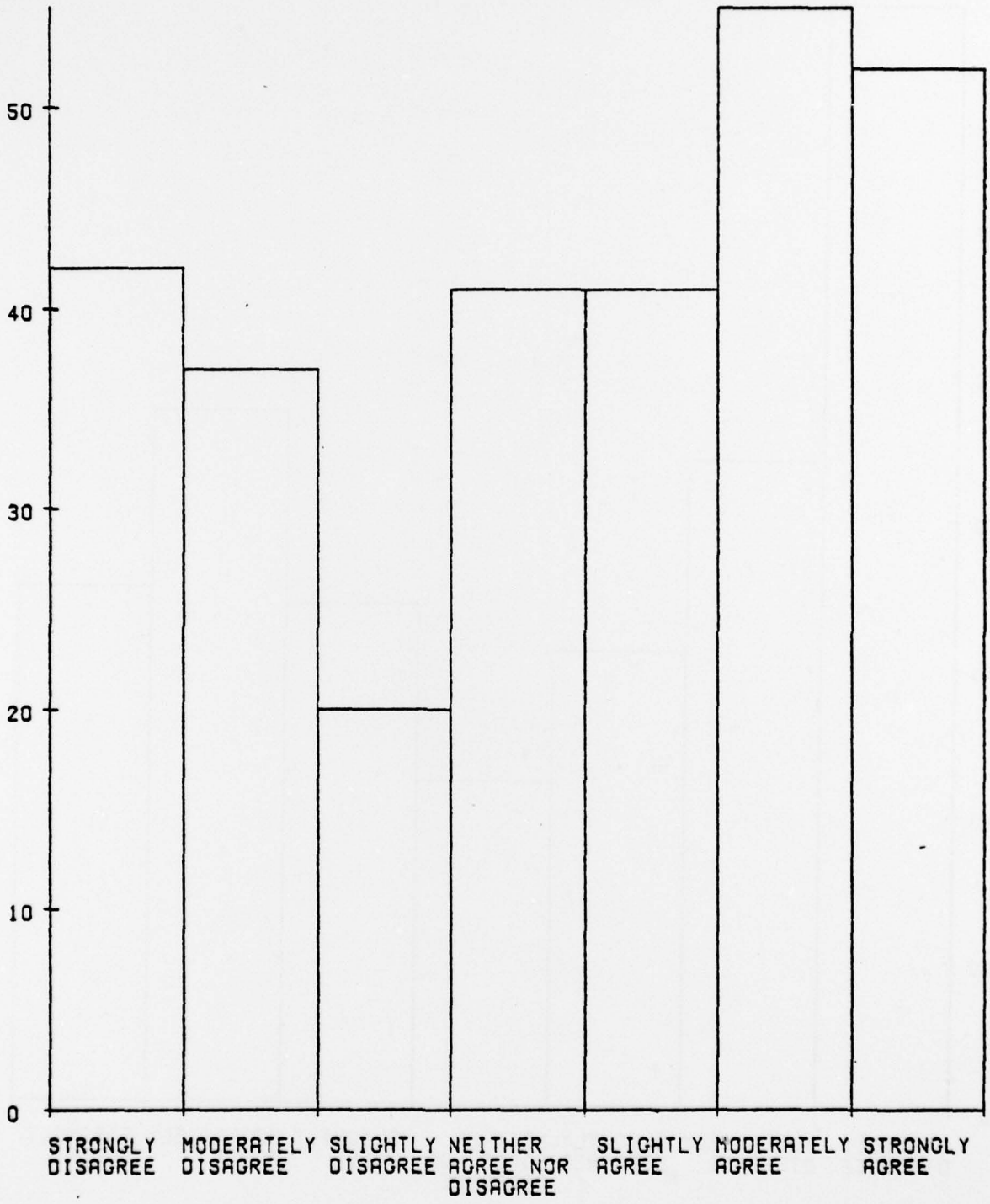
18. IT WILL TAKE A HIGH DEGREE OF SKILL AND KNOW-HOW ON MY PART TO ATTAIN FULLY MY WORK OBJECTIVES.



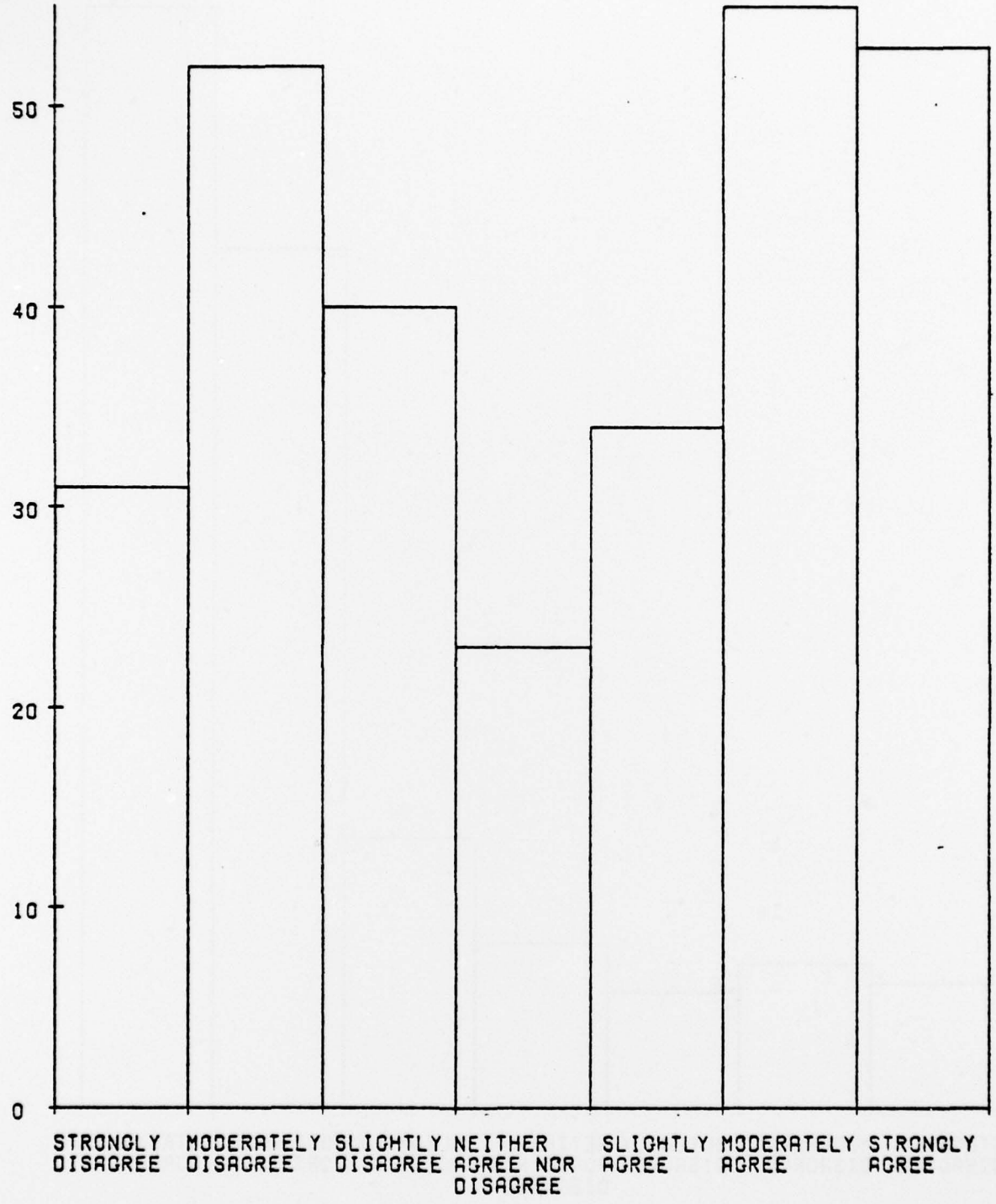
19. THE SETTING OF MY WORK GOALS IS PRETTY MUCH UNDER MY OWN CONTROL.



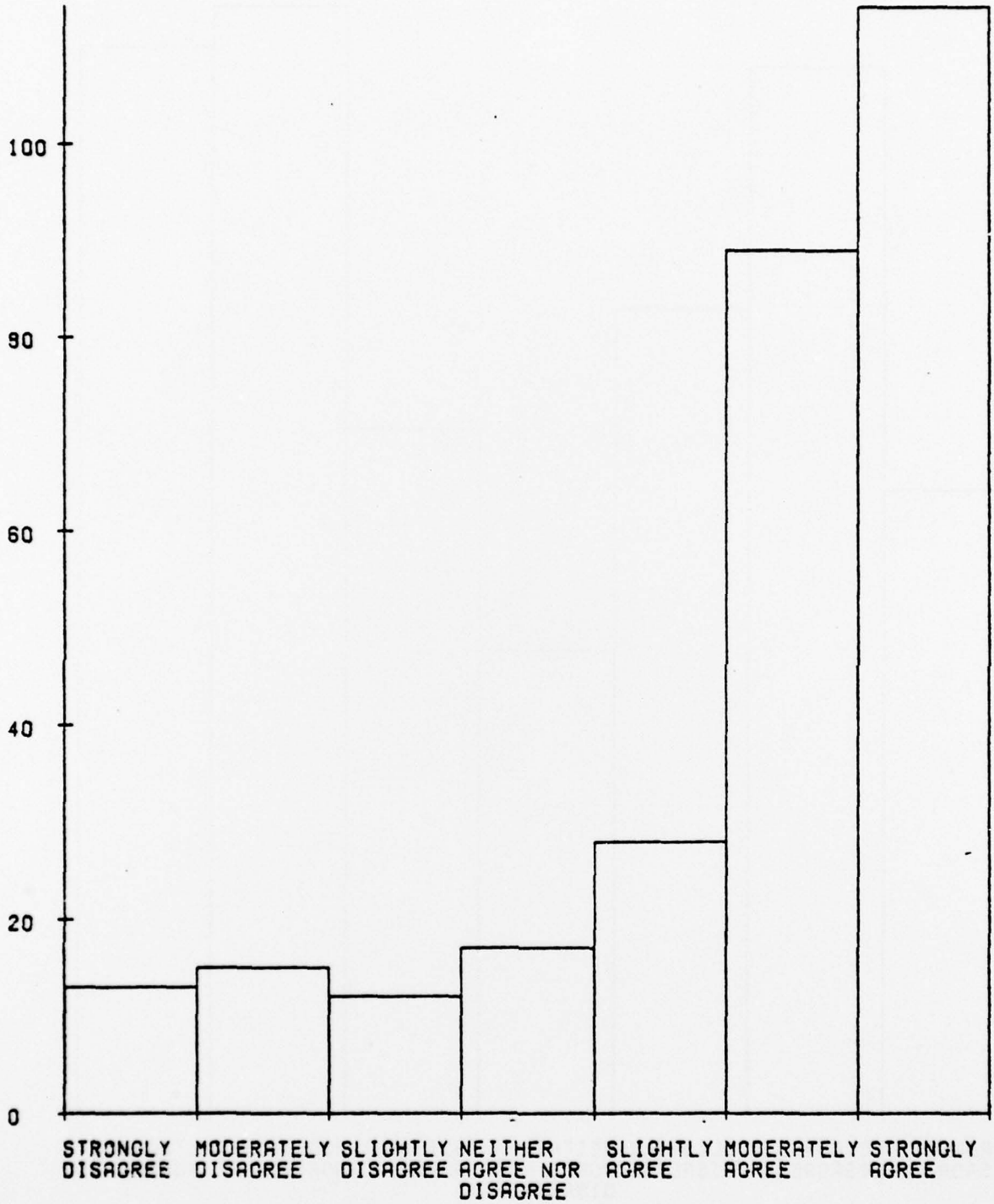
20. MY BOSS SELDOM LETS ME KNOW HOW WELL I AM DOING ON MY WORK TOWARD MY WORK OBJECTIVES.



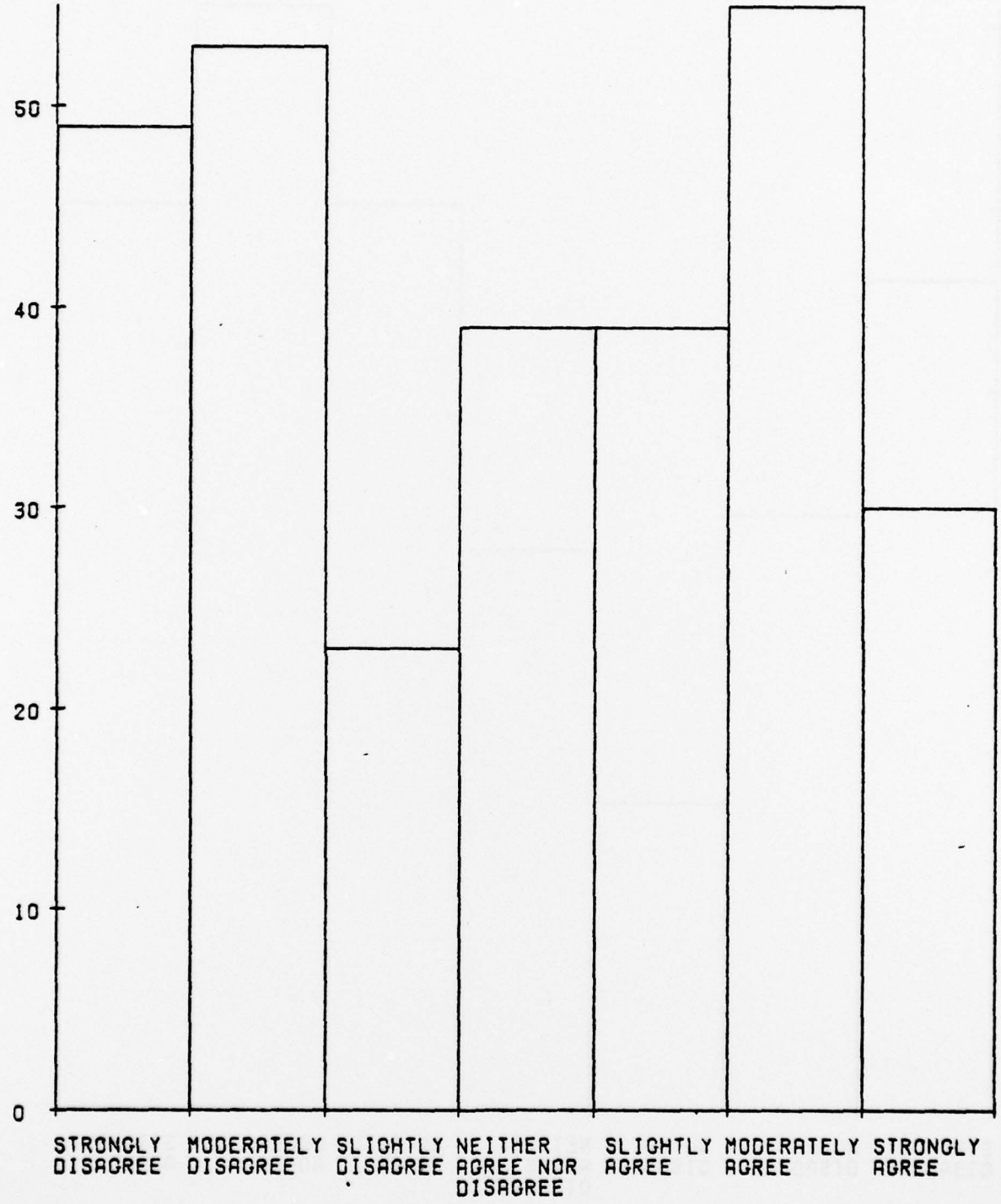
21. THERE IS A VERY COMPETITIVE ATMOSPHERE AMONG MY PEERS AND I WITH REGARD TO ATTAINING OUR RESPECTIVE WORK GOALS; WE ALL WANT TO DO BETTER IN ATTAINING OUR GOALS THAN ANYONE ELSE.



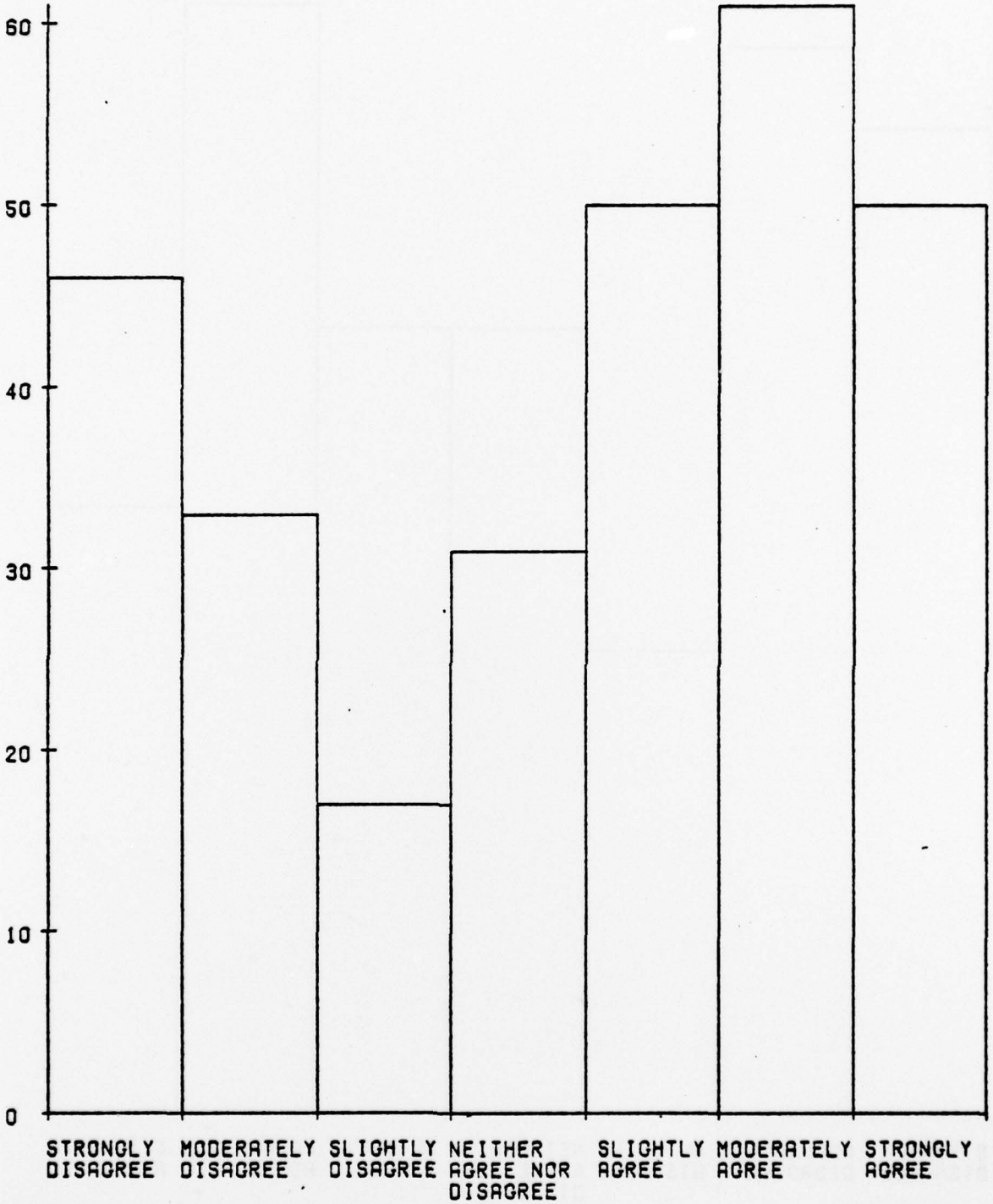
22. I AM PROVIDED WITH A GREAT DEAL OF FEEDBACK AND GUIDANCE ON THE QUALITY OF MY WORK.



23. I UNDERSTAND FULLY WHICH OF MY WORK OBJECTIVES ARE MORE IMPORTANT THAN OTHERS; I HAVE A CLEAR SENSE OF PRIORITIES ON THESE GOALS.



24. MY WORK OBJECTIVES ARE QUITE DIFFICULT TO ATTAIN.



25. MY SUPERVISOR USUALLY ASKS FOR MY OPINIONS AND THOUGHTS WHEN DETERMINING MY WORK OBJECTIVES.

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