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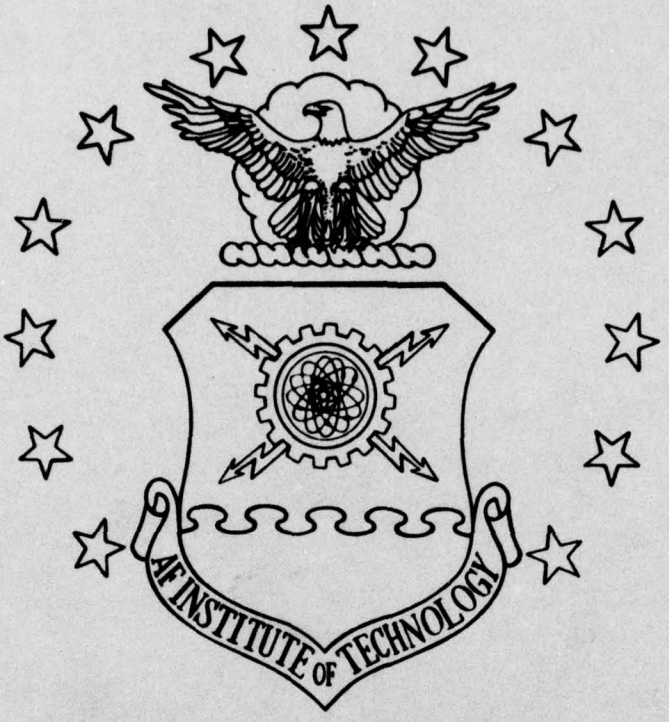

UNITED STATES AIR FORCE

AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

JOB ENRICHMENT: THE EFFECTS OF GROWTH NEEDS AND SOCIAL NEEDS ON THE JOB CHARACTERISTICS-JOB SATISFACTION AND JOB CHARACTERISTICS-PERCEIVED PERFORMANCE RELATIONSHIPS

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LSSR 24-77B

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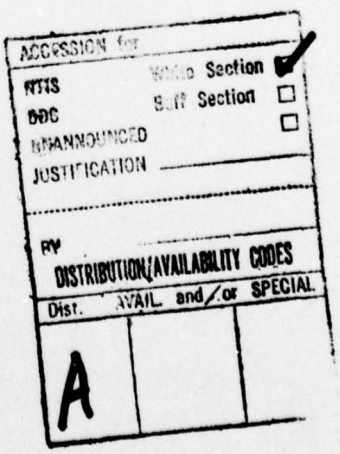

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This study examines the job characteristics-job satisfaction and job characteristics-perceived performance relationships using the job characteristics model developed by Hackman and Oldham (1976) as the theoretical base for analysis. Additionally, the study explores the possible moderating effects of individual growth needs and social needs on these relationships using both moderated regression and subgroup analysis. A full methodology is provided for using moderated regression, which is considered to be more appropriate in the analysis of moderator variables.

• The major conclusions of this study were that job characteristics were significant predictors of job satisfaction, and that neither individual growth needs nor individual social needs significantly or constantly moderate the job characteristics-job satisfaction/perceived performance relationships. Furthermore, it was found that social needs and growth needs were positively correlated, contrary to expectation. This last finding suggests that social and growth needs may be elements of a larger individual difference variable, need for personal worth, which is considered to be a more realistic indicator of individual differences.

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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

Degrees of Master of Science in Logistics Management

and Master of Science in Facilities Management

By

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(Captain Anthony C. Jones)

MASTER OF SCIENCE IN FACILITIES MANAGEMENT
(Captain David E. Ridenour)

DATE: 7 September 1977

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Chapter 1

INTRODUCTION

Rapid technological, social, and cultural changes have had a dramatic impact on organizations over the last decade (Huse, 1975). Rising labor costs, reduced capital availability, and slow economic growth have added to this impact, forcing management's attention to the fuller development of human resources in order to increase productivity (Reif, Ferazzi & Evens, 1974). Mills (1972) saw this interest in human resources as sound business. The development of human resources is at such a low point that the marginal return on investment can be relatively large.

Specialization of labor has enabled high speed, low cost production. However, extreme specialization, such as that found in mass production industries, often has serious effects on the worker, passing on to the productive system.

The problem is the degree of specialization. When do the disadvantages outweigh the advantages? The disadvantages dominate the advantages much more often than previously thought. The reasons are many but may be summarized in the "too-small-job-chain" where a repetitious job leads to monotony, boredom, job dissatisfaction, and ultimately poor job performance (Chase & Aquilano, 1973).

Organizations, by overspecialization and underdevelopment of human resources, have incurred excessive material, psychological and social costs (Walton, 1972). One conclusion is that organizations are failing themselves and society by not fully developing their human resources.

Employee Alienation: Social and Organizational Costs

The failure of organizations to develop their human resources has nurtured the growth of employee alienation. The problem of employee alienation has two parts associated with it. First, because of increased employee alienation, the output of American organizations is becoming inadequate to maintain our economic position internationally. Overall economic growth has and may continue to decline. Second, the social effects of employee alienation result from employee dissatisfaction with the job in which he works. This employee dissatisfaction is expressed by passive withdrawal, absenteeism, inattention on the job, sabotage, deliberate waste, assaults, violence, and other disruptions of the organization (Walton, 1972).

Additionally, a Health, Education and Welfare report on Work in America (1973) indicated that

> . . . as work problems increase, there may be a consequent decline in employee physical and mental health, family stability, and community participation and

cohesiveness. Additionally there may be an increase in drug and alcohol abuse, aggression, and delinquency. (p. xi)

Clearly, such incidents are manifestations of a conflict between changing employee attitudes and organizational inertia. Increasingly what employees expect from their jobs is different from what organizations are prepared to offer them (Walton, 1972).

Employee Alienation: Impact on the Military

Obviously, the military organization is affected by the same technological, social, and cultural trends that effect civilian industry (Crooch, 1976). However, the effects of employee alienation in the military can have more profound consequences.

Generally, requirements of national defense place higher demands upon quality and efficiency in the military than in civilian industry. Furthermore, because of improvements in weaponry, warning time has diminished so much that technical failure in strategic weapon systems could threaten our national survival. Therefore, the implication of any occurrence of employee alienation contributing to such technical failure has far greater significance (Herzberg & Rafalko, 1975). Additionally, reduced manpower, increased labor costs, and expanded mission responsibility magnifies

the need for new management techniques that increase individual levels of performance and satisfaction, while reducing [illegible]lienation (Crooch, 1976).

Job E[illegible] A Solution to Employee Alienation?

Military and civilian managements' concern with the more efficient use of human resources is commensurate with their growing interest in job enrichment as a useful management technique. Job enrichment assumes the best way to increase both job performance and satisfaction is to concentrate on redesigning the work itself (Reif, et al., 1974). Principally, the technique focuses on satisfying an individual's personal needs and goals through the work itself, rather than by work-related benefits such as pay, security, pensions, or other related fringe benefits (Porter, Lawler & Hackman, 1975). The prospects for job enrichment have been so great that the Health, Education and Welfare special report, Work in America (1973), selected it as the most encouraging method of improving work in organizations.

> The redesign of jobs is the keystone of this report. Not only does it hold out some promise to decrease mental and physical health costs, increase productivity, and improve the quality of life for millions of Americans at all occupational levels; it would give for the first time a voice to many workers in an

important decision making process. Citizen participation in the arena where the individual's voice directly affects his immediate environment may do much to reduce [employee] alienation in America. (Work in America, 1973, p. xii)

Job Enrichment and Individual Differences

Initially, successes in job enrichment application confirmed the publicized potential. Numerous case studies involving such companies as AT&T, Traveler's Insurance Company, Chemical Bank, and Kaiser Aluminum Company, have applied job enrichment techniques with very rewarding results in improving levels of performance and worker satisfaction (Ford, 1969; Walters, 1975). However, as these job enrichment efforts have spread, increasing numbers of failures raised questions about the continued viability of job enrichment as a management technique (Hackman, 1975). As evidenced by Reif et al. (1974) in a study on 300 of Fortune's top 1,000 industrial companies, only 37 of these companies had planned any job enrichment efforts. Additionally those companies planning these efforts were skeptical in their approach. Representative written comments from these companies, concerning their skepticism, were:

1. I would like to see more research prior to actually adopting job enrichment.

2. It [job enrichment] has limited applicability.

3. Problems in routine jobs are solved more efficiently by automation and technical improvements.

4. It is used reluctantly, but increasingly, and it is accepted with limited success. (Reif, Ferazzi, & Evens, 1974, p. 74)

One reason given for the quandry over job enrichment application was that existing theories were not adequate to meet problems encountered in their application (Hackman & Oldham, 1976). One school of thought suggested that early theories did not account for the moderating effect of individual differences (Hackman & Lawler, 1971). Specifically, the more complex, fulfilling jobs offered by job enrichment would be motivating only to individuals who have a strong desire for the high order growth needs (self-esteem, personal accomplishment, prestige) associated with those jobs (Hackman & Lawler, 1971, p. 284). Conversely, those individuals who have little desire for higher order growth needs are posited to have a high desire for social interaction needs (friendship, dealing with others) and would be motivated by jobs with greater opportunities to fulfill those social needs (Sims & Szilagyi, 1976, p. 226). In general, proponents of job enrichment agree that the job enrichment process is somehow linked to the psychological make-up of the individual, and there is strong evidence

supporting the individual difference approach to explaining this link. However, this support has been inconclusive. Therefore, for job enrichment to remain a viable technique, the underlying theory must focus on how the characteristics of jobs and the individual differences of workers interact to determine when an "enriched" job will have beneficial outcomes, and when it will not (Hackman & Oldham, 1976, p. 251).

Problem Statement

The full potential of job enrichment for maximizing the return on invested human resources cannot be realized unless its theoretical foundations are understood. Past research has indicated that individual growth needs effect how satisfied an individual will be with an enriched job; however, the impact of an enriched job on individual performance remains in doubt (Umstot, Bell & Mitchell, 1976). The effect of social needs as a moderator on the outcome of a job enrichment effort has not been studied. Consequently, additional research needs to be conducted to verify the moderating effects and possible interactions of individual growth need strength and social need strength on the desired job enrichment outcomes: increased performance and satisfaction.

Requirement for the Research

Despite present emphasis on pay and various other fringe benefits within the Air Force, there is a growing awareness by USAF managers that their subordinates want to be challenged, to have interesting jobs, and to be responsible for their actions. Additionally, these managers recognize that their subordinates want to be involved, and may be more satisfied if they are. Consequently, there has been an increasing interest in using job enrichment as a management technique within the Air Force (Crooch, 1976, p. 58).

However, little is known about the relative effects of applying various job enrichment strategies. There are a number of reasons for this state of affairs. Some are as a result of methodological difficulties in carrying out job enrichment projects; others derive from the limited capability to measure what happens when jobs are changed. Perhaps one of the most basic reasons for this problem is the inability of existing research to explain exactly how jobs affect the behavior and performance of employees (Hackman & Oldham, 1975, p. 159). Various job enrichment strategies may produce spectacular success in some organizations (Walters, 1975) and dismal failure in others (Frank & Hackman, 1975). While there were some areas of success in the Air Force use of job enrichment at the Ogden Air

Logistics Center, Ogden, Utah, there were also some incidents of resistance to change which reduced the overall success of the program (Rafalko, 1976, p. 50).

While Air Force implementation efforts are just beginning, parallels for successful implementation can be drawn from civilian industry. Central to civilian successes is the concept that job enrichment involves the identification of those job situations and individuals that will benefit most from the job enrichment process. If the Air Force can accomplish this identification process, then the Air Force should be able to maximize its return on the job enrichment investment while minimizing prospects of failure.

The current theory that best identifies jobs and individuals for the enrichment process is the job characteristics model of job enrichment developed by Hackman and Oldham (1975, 1976). This study used the job characteristics model in an analysis of data resulting from a previous survey conducted at an Air Force installation. If the theoretical basis of this model is supported, then the model may be generalized as appropriate for other military installations, thus providing a necessary technique for Air Force managers to identify those jobs and individuals which may benefit from a job enrichment process. The hypotheses that were tested were designed to examine the theoretical basis of the job characteristics model with the possible introduction of social need strength as a moderator variable.

Objectives

There were six objectives to the proposed research. First, the relationship between job characteristics and level of job satisfaction was investigated. Second, the basic relationship between job characteristics and level of job satisfaction was examined to uncover any moderating effects of growth need strength. Third, the relationship between job characteristics and individual level of perceived performance was investigated. Fourth, the relationship between job characteristics and individual level of perceived performance was examined for any moderating effects of social need strength. The fifth objective, the relationship between job characteristics and level of job satisfaction, was examined for any effects of social need strength. The sixth objective was to examine the relationship between job characteristics and individual level of perceived performance for any effects of social need strength.

Research Hypotheses

The following research hypotheses were tested to accomplish the first four objectives:

1. There is a positive relationship between job characteristics and job satisfaction. As job characteristics increase, job satisfaction increases.

2. The relationship between job characteristics and and job satisfaction is stronger for individuals with a high GNS, than for individuals with a low GNS.

3. There is a positive relationship between job characteristics and perceived performance. As job characteristics increase, perceived performance increases.

4. The relationship between job characteristics and perceived performance is stronger for individuals with a high GNS than for individuals with a low GNS.

Research Questions

The following research questions were studied to accomplish the last two objectives:

1. Is the job characteristics-job satisfaction relationship affected by the SNS?

2. Is the job characteristics-perceived performance relationship affected by the SNS?

Chapter 2

LITERATURE REVIEW

Job Interaction with Individual Differences

This chapter provides a literature review of research concerned with the job characteristics-worker response relationships and individual differences, with special emphasis on theories that consider the moderating effects of growth need strength. Additionally, the basis for the research questions regarding social need strength is discussed in terms of conceptual applications drawn from the literature.

Research on Individual Differences

Much of the early research suggests that individual differences moderate the job characteristics-worker response relationship (Pierce & Dunham, 1976, p. 87). The early individual differences discussed in the literature were urban versus rural background, alienation from the Protestant ethic, and growth need strength.

Urban versus rural background. Turner and Lawrence (1965) made the observation that job enrichment led to high job satisfaction and attendance for workers from factories

located in towns but not from cities. This observation came as a result of their study on worker motivation. Turner and Lawrence conducted a comprehensive analysis of employee reactions to various aspects of their job (variety, autonomy, required interaction, optional interaction, knowledge and skill, and responsibility). Those job attributes were measured by the Requisite Task Attribute Index (RTA Index) that they developed. Initially, Turner and Lawrence hypothesized that employees would respond favorably to jobs rated high in the RTA. Further, they predicted a positive relationship between job complexity and job satisfaction, and a negative relationship between job complexity and low attendance. This hypothesis was not supported. However, further analysis showed workers from small towns responded favorably in the hypothesized manner, and that workers from cities did not. Turner and Lawrence suggested the reason for the disparity was due to the social and subcultural differences between individuals living in towns versus cities.

Alienation from Protestant ethic. Blood and Hulin (1967) re-analyzed data from 1,300 blue-collar workers gathered by another researcher. They found a near zero relationship between skill level jobs and job satisfaction for blue-collar workers from highly urban areas; but a positive relationship between skill level and job

satisfaction was found for workers from less urbanized areas. They argued that workers from large cities could not be considered as being anomalistic on the basis of this evidence, but could be considered to be alienated from work norms of the middle class (belief in the work related aspects of Calvinism and the Protestant ethic), and integrated with the norms of their own particular subculture. They concluded that a job enrichment effort as a means of motivating workers, decreasing boredom and dissatisfaction, and increasing attendance and productivity, is valid only when applied to certain segments of the work force--white collar, supervisory, and nonalienated blue-collar workers (Hulin & Blood, 1968, p. 50).

Stone and Porter (1973) examined the relationship between job characteristics (as measured by the RTA Index) and job satisfaction for a sample of employees who worked and lived in urban areas. Results showed that indices of job characteristics were positively and significantly related to satisfaction with the work itself. Contrary to what is suggested by the Hulin and Blood (1968) study, Stone and Porter's sample of urban employees, who worked on jobs of higher complexity, did not experience greater dissatisfaction with work. Therefore, Stone and Porter concluded that their results did not support the findings of Hulin and Blood.

Growth need strength. A study by Hackman and Lawler (1971) was a major development in the study of employee reactions to job characteristics. They conceptualized that high satisfaction and high performance would result from desires for higher order need satisfaction (growth need strength) combined with conditions on the job such that performance would bring about the desired need satisfaction.

Their research was conducted on a group of 208 employees and 62 supervisors who worked in 13 jobs in the traffic department of an eastern telephone company. The 13 jobs were rated using four job characteristics of autonomy, variety, task identity, and feedback. Measures of desire for higher order need satisfaction were taken along with measures of criterion variables of satisfaction (motivation, performance, and attendance). In general, positive relationships were found between the four job characteristics and the four criterion variables. Analyses were performed in the upper and lower third of the sample based on higher order need strength. Growth need strength was found to be a moderator in the relationship between job satisfaction and three of the four job characteristics (autonomy, variety, and feedback). Additionally, the relationships were stronger for the higher growth need strength group than for the total sample and, the relationships were weaker for the lower need strength group than for the total sample.

Emergence of Growth Need Strength

The existence of differences either subcultural, sociological, or individual, appears to influence the job enrichment process. Wanous (1974) compared three of the previously proposed individual difference variables: urban versus rural background, strong versus weak belief in the Protestant ethic, and higher order need strength (growth need strength). The research was conducted in an eastern telephone company, using a sample of about 80 newly hired female telephone operators. His results indicated that higher order need strength is the most effective of the three individual differences studied, followed by the Protestant ethic which showed moderate effectiveness as a moderator variable, and last by the urban/rural difference which was generally ineffective (p. 620).

Growth need strength supported. In order to support or refute earlier findings, Brief and Aldag (1975) performed a constructive replication of the Hackman and Lawler (1971) investigation.[1] Brief and Aldag sampled 104 employees (at a Division of Corrections in a midwestern state) employed in a variety of jobs whose ultimate purpose was the rehabilitation of inmates. Significant positive correlations between job characteristics and worker responses (internal work motivation, general job satisfaction, performance, and absenteeism) were found only for individuals with high

growth need strength. Their findings provided additional support for and served to extend the applicability of the Hackman and Lawler study. However, Brief and Aldag questioned how growth need strength actually moderates the relationships, even though they found generally significant support for its moderating influence.

Hackman and Oldham (1975, 1976) developed and tested a "job characteristics model" which was an attempt to extend, refine, and optimize the relationships between job characteristics and worker responses. The basic job characteristics model is presented in Figure 1. At the most general level, five job characteristics are seen as prompting three psychological states which in turn lead to a number of beneficial personal and work outcomes. The links between the job characteristics and the psychological states, and between the psychological states and worker responses, are shown as moderated by individual growth need strength. Their model was tested using data from 658 employees working on 62 different jobs in seven organizations. The jobs were highly heterogeneous, including blue-collar, white-collar, and professional workers. The organizations were all business organizations located in the East, Southeast, and Midwest in both urban and rural settings.

The primary data collection instrument was the Job Diagnostic Survey (Hackman & Oldham, 1975) which was designed to measure each of the variables in the job

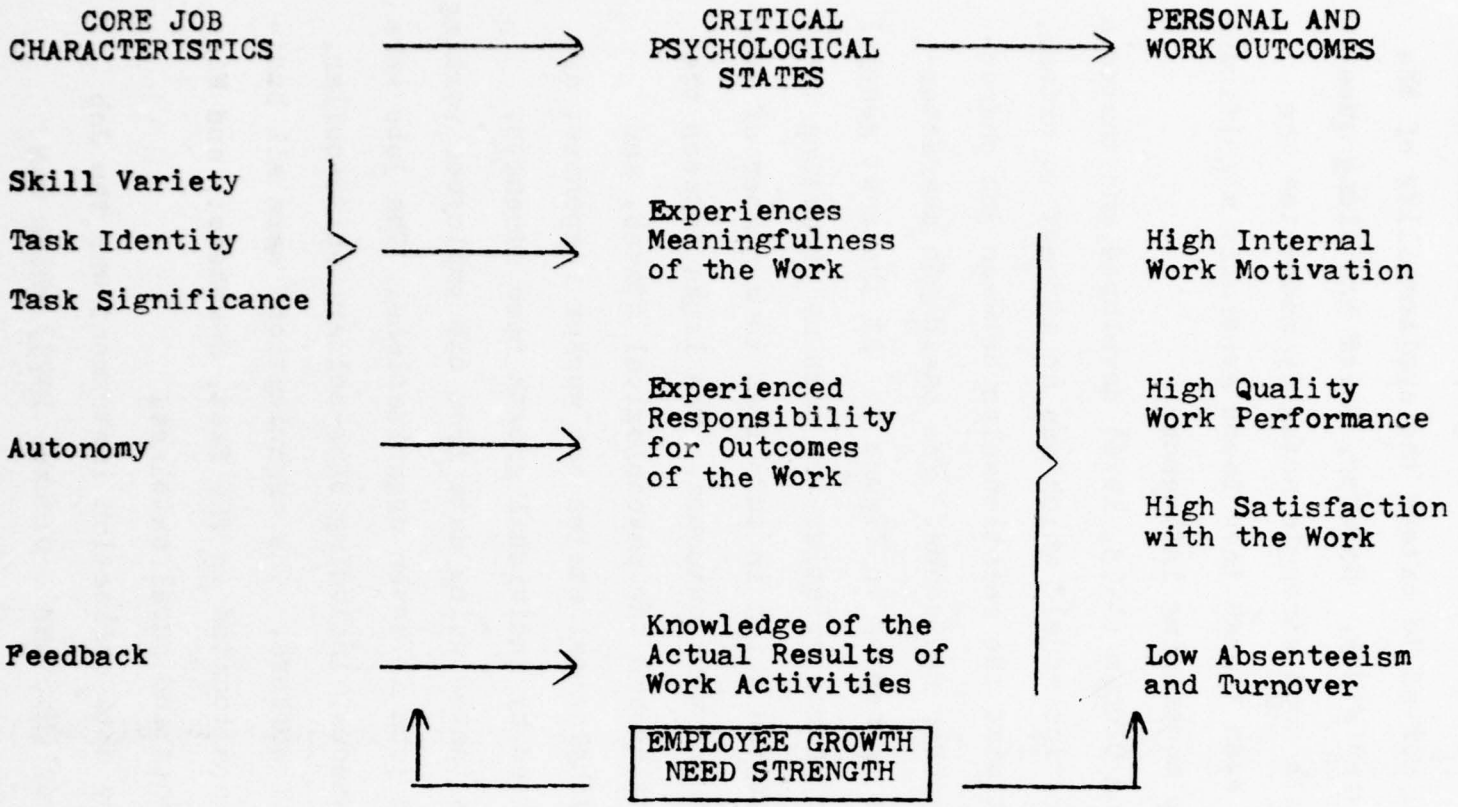

Figure 1. The Relationships Among the Core Job Dimensions, the Critical Psychological States, and On-the-Job Outcomes (Hackman, Oldham, Jansen & Purdy, 1975).

characteristics model. Partial correlations and multiple regression analyses demonstrated that the model was usable. They also found that growth need strength moderated the job characteristic-psychological state relationship and the psychological state-worker response relationship. They argued that all subjects respond to job enrichment efforts, but that workers with higher growth need strength respond more favorably. In other words the extent to which job enrichment can be expected to have positive consequences is dependent on the growth need strengths of employees.

Sims and Szilagyi (1976) tested for the moderating effect of growth need strength on the job characteristics-worker response (performance and satisfaction) relationship. Their research was conducted using responses from 766 paramedical and support personnel at a major midwestern medical center. They also found high growth need strength generally created a stronger relationship between job characteristics and worker response.

Growth need strength not supported. When the effects of growth need strength on the relationship between job characteristics and worker response are examined, the results are not always definitive. For example, several studies discussed found a statistically significant relationship between job characteristics and job satisfaction before growth need strength was considered (Brief & Aldag, 1975; Hackman &

Lawler, 1971; Stone, 1976; Umstot, et al., 1976). When the effects of growth need strength in these relationships are considered, the results are not conclusive. Subgroup analysis on high and low growth need strength groups in three studies failed to show any significant changes due to the moderating effect of growth need strength (Brief & Aldag, 1975; Hackman & Lawler, 1971; Hackman & Oldham, 1976).

In addition, the relationship between job characteristics and job performance was weak before growth need strength was considered (Hackman & Lawler, 1971; Umstot, et al., 1976). When growth need strength was introduced, the relationship was enhanced only slightly, although in the predicted direction (Hackman & Lawler, 1971; Hackman & Oldham, 1976; Wanous, 1974).

Champoux (1976) tested the moderating effect of growth need strength as predicted by the Hackman and Oldham (1976) model through the use of moderated regression analysis (Saunders, 1956; Zedeck, 1971). When moderator variables are conceptualized as continuous variables, Zedeck (1971) argued that the proper analytic approach is moderated regression analysis. Champoux's test design avoided the problems associated with subgroup analysis by treating growth need strength as a continuous variable in a moderated regression analysis. The outcome of Champoux's study was in contrast to the earlier research in that his results suggest that growth need strength may not operate

as a moderator. The individuals in Champoux's study who had jobs high in job characteristics had positive responses to their jobs regardless of their level of growth need strength (Champoux, 1976, p. 7). Champoux noted that none of the earlier studies used moderated regression analysis. Each of them divided the distribution of growth need strength scores at some arbitrary point and used subgroup analysis to support their arguments. Champoux suggests a re-analysis of the data from earlier studies or further research using moderated regression analysis may provide more conclusive evidence supporting or refuting the moderating effect of growth need strength.

Growth need strength summary. The moderating effect of growth need strength on the job characteristics-worker response relationship has not been precisely determined. While some relationships have been consistently influenced by growth need strength (e.g., autonomy-satisfaction, variety-satisfaction, feedback-satisfaction), others fail to reach a satisfactory level of statistical significance. Nevertheless, there is evidence to support the contention that growth need strength is an indicator of individual differences, and that individuals with high growth need strength are more satisfied with enriched jobs than individuals with low need strength (Brief & Aldag, 1975; Hackman & Lawler, 1971; Hackman & Oldham, 1976; Sims & Szilagyi,

1976; Wanous, 1974). These findings underlie Hypotheses One and Two of this study. (See Page 10.)

The effect of growth need strength on the job characteristics-job performance relationship remains inconclusive. While some studies report relationships which are in the predicted direction (Hackman & Lawler, 1971; Hackman & Oldham, 1976), these relationships are not statistically significant. Additionally, there is little or no supporting evidence for a relationship between job characteristics and job performance (Umstot, et al., 1976; Sims & Szilagyi, 1976). These findings underlie Hypotheses Three and Four.

Social Need Strength as an Individual Difference Variable

Several researchers have alluded that growth need strength may not be the sole influence of the job characteristics-worker response relationships (Hackman & Lawler, 1971; Sims & Szilagyi, 1976; Stone, Mowday & Porter, 1976; Steers & Spencer, 1976). They emphasize that perhaps other individual difference variables should be examined. If these variables are appropriate, they should be incorporated into a more comprehensive model describing the influence of individual differences on the job characteristics-worker response relationships.

Relevance of social need strength. Literature on behavior in organizations suggests that individual social

needs, and how they are fulfilled, have a significant impact on attitudes toward work. Additionally, the quality of the relationship between an individual and an organization depends, in part, on the degree that the individual's needs are satisfied by participating in organizational activities (Alderfer, Kaplan & Smith, 1974). While the desire to satisfy social needs is used extensively to explain interaction in a group (Porter, Lawler & Hackman, 1975, Chapter 13), there are some indications that social needs may have a more direct bearing on individual performance and satisfaction (Hackman & Lawler, 1971). Alderfer, Kaplan and Smith (1974, p. 510) suggest that desires for social relatedness needs must be satisfied before any other desires or needs become significant to an individual working in an organization. It may be inferred from this that satisfaction of an individual's social needs is relevant to individual behavior toward an organization and, perhaps, to his satisfaction and performance on the job.

Social need strength: moderating influence? Porter, Lawler, and Hackman (1975, Chapter 14) discuss how social influences of groups relate to work effectiveness of individuals in organizations. They suggest that the group social environment interacting with the social needs of individuals within the groups can effect levels of individual performance and satisfaction.

Hackman and Lawler (1971, p. 283) point out previous research which indicates that when individuals have had ample opportunity to satisfy their social needs, then the desire for additional social satisfaction will decrease and the level of desire for growth needs will increase. Hackman and Lawler suggest that negative correlations might occur with the job characteristics-worker response relationships from workers with jobs that do not satisfy their social needs. Additionally, they noted that when jobs are changed, interpersonal relationships, especially between worker and supervisor, are substantially affected. This has the potential of negating or reversing increases in performance and satisfaction resulting from a job enrichment process.

Sims and Szilagyi (1976, p. 226) made the assertion that employees who are low in growth need strength may be high in social need strength in an effort to explain the statistically significant relationship which they found occurred between performance and friendship/dealing with others. They postulated that employees who have a high social need strength and a low growth need strength are likely to find jobs that are high on friendship and dealing with others to be more motivating toward high performance than jobs low on friendship and dealing with others.

The indication from prior research is that social need strength may moderate the job characteristics-worker

response relationship. This is the basis for the two research questions in this study. (See Hulin and Blood, 1968; Nemiroff and Ford, 1976; and Pierce and Dunham, 1976, for a more complete review of individual difference research.)

Chapter 3

METHODOLOGY

Overview of Methodology

In order to examine the effects of individual growth need strength and social need strength on the relationships between job satisfaction and job characteristics and between perceived performance and job characteristics, existing survey data were analyzed. Individual scores in growth need strength, social need strength, job satisfaction, perceived performance and job scope were obtained from that analysis. The individual scores were statistically examined to establish support or non-support for the research hypotheses. Two methods of statistical analysis were simultaneously used: Pearson correlation on subgroups based on the moderator score, and moderated regression.

Population and Sample

Population. The population to which research findings were generalized was the Air Force DOD workforce.

Sample. The sample was taken from civilian and military workers at a large Air Force industrial facility operating in the central United States. The sample consists of workers from all areas of the organization except

the Maintenance Directorate. These workers include industrial workers from the shops, line supervisors and middle and upper management. They rank from the low enlisted and wage board ratings to colonel. Once the work groups were identified, an effort was made to obtain 100% participation by all workers in the selected groups (i.e., a census of the involved workers). That percentage was not possible, however, because participation in the original study was voluntary and not all of the workers in the selected groups chose to participate. The sample demographics are shown in Table 1.

Possible bias in the sample. Some negative bias, resulting in lower scores in the areas of satisfaction, perceived performance and core job characteristics, could have resulted from the unfortunate timing of the Inspector General's (I.G.) visit to the installation. The I.G.'s schedule is not released prior to inspections; therefore, no allowance could be made to avoid the visit. The I.G. evaluated the installation just prior to the week that the survey was administered. The I.G. evaluation was relatively low. The repercussions of that rating were still occurring organization-wide when the survey was administered. The low evaluation from the I.G. may have led to lower survey scores, but it is not possible to quantify this assertion.

TABLE 1

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE (N = 359)

	N	PERCENT*
SEX		
Male	235	65
Female	124	35
AGE		
Under 20	15	4
20-24	18	5
25-29	38	11
30-39	87	24
40-49	108	30
50-59	78	22
60 +	15	4
EDUCATION		
Some high school	27	8
High School degree	106	30
Some college or tech school	126	35
College or tech school degree	63	18
Some graduate work	13	4
Master's or higher degree	11	3

*May not add to 100 because of missing responses

Additional negative bias may have resulted from administration of the survey during the record cold of the worst winter in 100 years. The survey was given in the middle of an eastern cold wave and blizzard of unusual severity. Conditions were so bad that many workers were unable to report for work, and overall absenteeism ran higher than expected. The original plans were to give the survey in three days; however, because of the high number of workers unable to participate, the survey was extended to allow collection of a larger sample.

Survey Participation Rates

The intended sample, those workers who were members of the selected work groups, numbered 531 people. Out of that number, 170 workers did not participate, either because they could not report to work during that week or because they did not want to volunteer the required information. Surveys were completed by 361 employees, yielding a participation rate of 61% of the intended sample.

Survey Instrument

Design of the survey. The Job Attitude Survey II was jointly developed by Lloyd and Umstot. The survey is a composite containing: (a) the short form of the JDS, (b) the "satisfaction with the work itself" index from the JDI, (c) self perception productivity questions, (d) an index of

SNS, and (e) demographics (other indices are included but are not of primary interest in this study). The survey text is included in Appendix B.

Variables and the Measurement of Variables

In discussing variables and measures of variables, it is necessary to keep in mind the purpose of the research which is to investigate relationships between the characteristics of the job, worker satisfaction, worker performance, and individual differences. The specific relationships under investigation are:

1. Job characteristics and job satisfaction moderated by growth need strength (GNS).

2. Job characteristics to perceived performance moderated by GNS.

3. Job characteristics to job satisfaction moderated by social need strength (SNS).

4. Job characteristics to perceived performance moderated by SNS.

Categories of variables. In order to identify and measure the relationships between the individual's job, the result of the individual's effort while doing the job, and the individual's higher psychological needs, five basic variables will be used.

The predictor variables were the level or amount of job enrichment contained in the existing job as measured by the motivating potential score, and each of the core job characteristics comprising the motivating potential score. The two criterion variables were job satisfaction and perceived performance. The two moderating variables were individual GNS and SNS.

Predictor variables. The job characteristics contained in each worker's job were measured using the short form of the Job Diagnostic Survey (JDS) (Hackman & Oldham, 1975). This instrument is widely used in job characteristics research. Its properties, including item format, content and scale reliability have been well documented by its originators. It has been shown to be a valid and reliable measure of the level of enrichment present in a job (Hackman & Oldham, 1975).

The Hackman-Oldham model stated that the level of enrichment in any job was determined by the level of the five core job dimensions (their term for job characteristics included in their model):

Skill Variety. The degree to which a job requires a variety of different activities in carrying out the work which involves the use of a number of different skills and talents of the employee.

Task Identity. The degree to which the job requires completion of a "whole" and identifiable

piece of work . . . i.e., doing a job from beginning to end with a visible outcome.

Task Significance. The degree to which the job has a substantial impact on the lives or work of other people . . . whether in the immediate organization or in the external environment.

Autonomy. The degree to which the job provides substantial freedom, interdependence, and discretion of the employee in scheduling the work and in determining the procedures to be used in carrying it out.

Feedback from the Job Itself. The degree to which carrying out the work activities required by the job results in the employee obtaining direct and clear information about the effectiveness of his or her performance. (Hackman & Oldham, 1976, p. 258)

The level of job enrichment contained in a job may be quantified by calculating the motivating potential score (MPS). This score reflects the potential of a job for eliciting positive internal work motivation in the individual worker. The MPS is calculated for each worker as follows: MPS =

$$\left(\frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3}\right) \times \text{Autonomy} \times \text{Feedback}$$

Scores on MPS can range from 1 to 343. An enriched job would be expected to produce a high MPS, while an unenriched job would be expected to produce a low MPS. The formula indicates a non-linear relation where autonomy and

feedback operate directly (as multipliers) while skill variety, task identity and task significance act in concert (as indicated by the averaging of those three core job dimensions). A high level of any one core job dimension acts to raise the MPS; that is, it raises the level of job enrichment. A low level of any one core job dimension acts to lower the MPS (decrease the level of job enrichment).

Predictor Variables Used in Analysis

Both the MPS and each separate job characteristic were used as predictor variables. This allowed an in-depth examination of how the predictive power of each of the job characteristics was effected by GNS and SNS as well as allowing examination of how the predictive power of the entire model (MPS) was effected by GNS and SNS.

Criterion variables. There were two criterion variables: job satisfaction and perceived performance.

Job satisfaction was measured using the "satisfaction with the work itself" scale from the Job Descriptive Index (JDI) (Smith, Kendal & Hulin, 1969).

The JDI, like the JDS, is well tested and has established its validity and reliability (Smith, Kendal, & Hulin, 1969; Vroom, 1964). The standard weighting system developed by Smith, Kendal, and Hulin (1969) was used to score the JDI scale since it tended to eliminate some skewness in the score distribution and produced a more normal distribution.

This scoring system produced satisfaction scores ranging from 0 to 54.

The "General Satisfaction" scale from the JDS was used as a second measure of job satisfaction. The JDS scale is an overall measure of worker satisfaction and happiness (Hackman & Oldham, 1975). The use of this scale allowed investigation of the consistency of the relationships between jobs and satisfaction. It was possible to determine if the level of worker satisfaction responded to the level of job enrichment in the same manner when satisfaction was measured in two different ways.

Perceived performance was measured in terms of the performance of the work group as seen by the individual. Perceived performance is a subjective measure of effectiveness. It has, however, been shown to be significantly related to objective performance measures. In studies at NASA and in ten hospitals, Mott (1972) found that perceived effectiveness (performance) was positively correlated with the actual effectiveness of the organization as determined by experts. Engle (1977) also found the positive relationship between perceived performance and actual organizational effectiveness as determined by objective rating standards. The Engle (1977) research provides much support for Mott's assertion of the validity of the subjective measure. Use of the subjective measure has produced the same ranking of subject organizations as did use of the objective (ranking by experts) measures (Engle, 1977).

The questionnaire items used to measure perceived performance include three items from the Mott (1972) instrument. The questions are intended to measure Production Quantity (41), Production Quality (42), and Production Efficiency (43).[2] These questions were scored following Mott's method: the numbers above the selected response were added and their sum divided by 3 to obtain a perceived productivity score between 1.00 and 5.00 for each individual worker. These scores were then averaged by work group and assigned back to the individual worker. Any missing items were deleted from the computation of the average score.

It was hoped that the format of the question asking "How do those around you perform?" rather than "How do you perform?" would lessen the natural defensive reaction to such a question.

Moderator variables. There were two individual difference or moderator variables: growth need strength and social need strength. Both need strengths were measured using indices included in the Job Attitude Survey II.

Growth need strengths were measured using Questions 66, 69, 72, 75, 77, and 79. These questions are taken from the JDS and measure GNS by asking to what degree an individual "would like" to have certain characteristics present in his job. The possible responses range from "would like having this only a moderate amount (or less)" through "would like having this very much" up to "would like having this

extremely much." Numerical responses range from 4 to 10, emphasizing that each of these characteristics are normally desirable and liked. In scoring GNS, each item response was reduced by three (resulting in a 7 point Likert Scale). These item scores were then averaged to yield an index of GNS ranging from 1.00 to 7.00. This "would like" format is well tested and its validity established (Hackman & Lawler, 1971; Hackman & Oldham, 1975; Sims & Szilagyi, 1976).

Social need strength was measured using five similar questions (Numbers 65, 68, 71, 73, and 78) of the same "would like" format developed by Umstot. These items were scored using the same procedures as GNS, yielding an index of SNS ranging from 1.00 to 7.00. This index has been used only once before. At that time all items were found to produce high factor loadings in a factor analysis (Lloyd, 1977).

Methods of Data Analysis

There were two methods of data analysis used in the research: the moderated regression technique developed by D. R. Saunders (1956), and the more traditional Pearson product moment correlation using subgroups formed from high and low need strength individuals. The use of these two methods together has some unique advantages. First, each method treats the moderator variable in a different way. Moderated regression views a moderator as continuous as it applies to each individual, while subgroup analysis

views moderator strength between high and low scoring groups of individuals as either "high" or "low." The difference in approach provided some additional insight into the nature of GNS and SNS as moderators. Second, the simultaneous application of the two somewhat divergent techniques to the same data provided more information on the relative discriminatory power of subgroup analysis and moderated regression.

Moderated regression. Moderated regression provides a means of maintaining the continuous nature of a moderator variable. Specifically, GNS is defined over a continuum (Hackman & Oldham, 1975). SNS is also seen as a continuous variable (Sims & Szilagyi, 1976). The value of the moderator (GNS, SNS) is that it indicates, on the individual level, the effectiveness of a predictor variable (job characteristics, MPS) in estimating a criterion (job satisfaction, perceived performance). Zedeck (1971) refined Saunders' (1956) definition of moderator variables:

> A true moderator is not a discontinuous qualitative variable that differentiates subgroups of individuals who are qualitatively different, but is a continuous quantitative variable and individuals distribute all along its continuum. (Zedeck, 1971, p. 295)

Most of the previous applications have greatly reduced the predictive value of moderators by subgrouping these continuous moderating variables at the mean, at upper and lower 1/3 points, at the upper and lower quartile points or in

some other arbitrary manner (Champoux, 1976). This conversion of quantitative data into qualitative data reduces the resulting explanatory power of the analysis. Additionally, the division of the moderator distribution is an arbitrary one because of the many cutting points; thus, it can arbitrarily effect the final outcome of the analysis. Moderated regression avoids conversion of continuous moderating variables to qualitative variables.

The procedure involves the calculation of three regression equations for each case. The resulting differences in R^2 values for each regression are then tested using an F test as proposed by Cohen (1968). An in-depth explanation of the moderated regression technique is contained in Appendix A.

Subgroup analysis. The data base was divided into high and low need strength categories based on the individuals' respective score on GNS and SNS. The grouping was by thirds, as done by Hackman and Lawler (1971). The high need strength group consisted of those individuals who placed in the top 1/3 of the need strength distribution. The low need strength group consisted of those individuals who placed in the bottom 1/3 of the need strength distribution. These subgroups were made independently for GNS and SNS. Correlations were run between the predictors (job characteristics and MPS) and the criterion variables (satisfaction and perceived performance) for each subgroup. A Fisher Z-test was

was then made on the resulting correlation coefficients. If the differences between high and low need strength groups were statistically significant, then the moderating action of the respective need strength was considered supported.

Level of significance and reporting. A level of significance (alpha level) of 0.05 was used in all hypothesis tests. Current literature indicated that this alpha level was both generally accepted and widely used in the social sciences. Stronger relationships, those that hold at a smaller alpha level, were reported along with their minimum significant alpha level. Weaker relationships, those that hold at alpha levels between 0.05 and 0.10, were also reported to allow the reader to make his own evaluation of the research results.

For main effects, the percentage of variation accounted for was computed. Any effect accounting for more than 20% of the total variance was considered to support the hypothesis in question.

Assumptions

The use of this survey data is based on three assumptions:

1. The survey data is valid. This assumption is necessary since the researchers had no part in the survey preparation or the data collection.

2. The survey sample structure is acceptable for this research. That is, the fact that the original sample

was not a simple random sample did not greatly effect the outcome of the statistical analysis. This assumption is necessary because the data was collected by work groups for analysis by groups. The current research analyzed the data on a purely individual basis. This assumption seems well founded since each work group contained a variety of different jobs. Therefore, each job had a relatively even chance of being included in the sample when the work groups were selected, giving the sample the characteristics of a simple random sample.

3. The group average perceived performance score assigned to each individual reflects his own actual performance. This assumption is necessary because the only performance measure available on the Job Attitude Survey II is Mott's group perceived performance scale. This assumption seems valid intuitively since the individual is a member of the work group and his performance would be expected to follow the performance of the group.

CHAPTER 4

RESULTS OF RESEARCH

The results are presented in three sections. First the main effects are shown. These results indicate the effect that job characteristics had on satisfaction and on perceived performance before considering the influence of growth need strength and social need strength. The second section covers the moderating effects of growth need strength. The third section covers the moderating effects of social need strength.

General Relationships Between Core Job Dimensions and Employee Work Outcomes

According to the conceptual position of the thesis, the nature of the relationships between job characteristics and employee work outcomes depends on the need strengths of the individual employees. Specifically, it was hypothesized that employees with higher growth need strength would exhibit stronger positive relationships between job characteristics and employee work outcomes than employees with lower growth need strength. Furthermore, it was questioned whether an employee's desire for

social needs would moderate the relationship between job characteristics and work outcomes.

Correlations Between Job Characteristics and Work Outcomes

Prior to analyzing the possible moderating effects of growth needs or social needs, the core job characteristics were correlated with the work outcome measures. The results are shown in Table 2. As expected, generally the aggregate measure of job characteristics, the motivating potential score, exhibited a stronger relationship with employee work outcomes than did the core job characteristics comprising the MPS. The task significance-general satisfaction (JDS) (r = .43) relationship was the only exception to this result.

The general satisfaction (JDS)-core job characteristic relationship closely paralleled the findings reported by Hackman and Oldham (1976, p. 263) with the exception of autonomy and task significance. Hackman and Oldham found the general satisfaction to be more positively related to autonomy (r = .38) than found in this study (r = .28). Furthermore, they found the general satisfaction and task significance (r = .21) relationship to be much weaker than in this study (r = .43).

The satisfaction with the work itself (JDI)-core job relationships were generally found more positive than those

TABLE 2

PEARSON CORRELATIONS BETWEEN JOB CHARACTERISTICS AND EMPLOYEE WORK OUTCOMES

Criterion Variables	Core Job Characteristics											
	Skill Variety		Task Identity		Task Significance		Autonomy		Feedback		Log MPS	
	r	R^2	r	R^2	r	R^2	r	R^2	r	R^2	r	R^2
General Satisfaction (JDS)	.28***	.08	.20***	.04	.43***	.18	.28***	.08	.38***	.14	.42***	.18
Work Satisfaction (JDI)	.49***	.24	.36***	.13	.42***	.18	.44***	.19	.43***	.18	.57***	.32
Perceived Performance	.15***	.02	.14**	.02	.21***	.04	.11*	.01	.18***	.03	.22***	.05

Note. n = 359

*p<.05

**p<.01

***p<.001

reported by Brief and Aldag (1975, p. 183). All relationships were stronger except for autonomy (r = .51 for Brief and Aldag, r = .44 for this study).

Additionally, the motivating potential score (MPS) explained approximately 32 percent of the variance in satisfaction with the work itself (JDI) and approximately 18 percent of the variance in general satisfaction (JDS). This result supports Hackman and Oldham's (1976) use of MPS as a better predictor of satisfaction than the individual job characteristics used separately.

Analysis of perceived performance and core job characteristics resulted in overall weaker relationships. (See Table 3a.) The motivating potential score explained only 5 percent of the variance in perceived performance. This indicates the overall weak explanatory power of MPS for perceived performance.

Intercorrelations Among The Variables

Correlations among the job characteristics, moderator, and work outcome measures also were analyzed prior to conducting an analysis of the moderating effects (Table 3).

Intercorrelations among the core job characteristics were found to be stronger in this study than those reported by Hackman and Oldham (1976, p. 167) when developing the job characteristics model. Additionally their weak results

TABLE 3

CORRELATIONS AMONG JOB CHARACTERISTICS

Variables	Skill Variety	Task Identity	Task Significance	Autonomy	Feedback	Motivating Potential Score
Skill Variety	-	-	-	-	-	-
Task Identity	.33 (.001)	-	-	-	-	-
Task Significance	.41 (.001)	.26 (.001)	-	-	-	-
Autonomy	.35 (.001)	.48 (.001)	.28 (.001)	-	-	-
Feedback	.31 (.001)	.36 (.001)	.41 (.001)	.47 (.001)	-	-
Motivating Potential Score	.56 (.001)	.59 (.001)	.56 (.001)	.79 (.001)	.78 (.001)	-
Log of the Motivating Potential Score	.55 (.001)	.58 (.001)	.51 (.001)	.81 (.001)	.81 (.001)	.88 (.001)

(Significance level)

TABLE 3a

CORRELATIONS AMONG JOB CHARACTERISTICS, MODERATORS, AND WORK OUTCOMES

Variables	Growth Need Strength	Social Need Strength	General Satisfaction (JDS)	Satisfaction With the Work Itself (JDI)	Perceived Performance
Skill Variety	.16 (.002)	.07 (.086)	.28 (.001)	.49 (.001)	.15 (.002)
Task Identity	.12 (.011)	.06 (.141)	.20 (.001)	.33 (.001)	.14 (.004)
Task Significance	.03 (.298)	.19 (.001)	.43 (.001)	.42 (.001)	.21 (.001)
Autonomy	.20 (.001)	.06 (.138)	.28 (.001)	.44 (.001)	.11 (.018)
Feedback	.12 (.013)	.10 (.030)	.38 (.001)	.43 (.001)	.18 (.001)
Motivating Potential Score	.22 (.001)	.15 (.003)	.41 (.001)	.55 (.001)	.18 (.001)
Log of the Motivating Potential Score	.13 (.009)	.07 (.082)	.42 (.001)	.57 (.001)	.22 (.001)

(Significance Level)

TABLE 3b

CORRELATIONS AMONG MODERATORS AND WORK OUTCOMES

Variables	Growth Need Strength	Social Need Strength	General Satisfaction (JDS)	Satisfaction With the Work Itself (JDI)
Growth Need Strength	-	-	-	-
Social Need Strength	.48 (.001)	-	-	-
General Satisfaction (JDS)	-.02 (.352)	.15 (.002)	-	-
Satisfaction With the Work Itself (JDI)	.10 (.034)	.13 (.009)	.68 (.001)	-
Perceived Performance	-.03 (.290)	.14 (.005)	.13 (.007)	.18 (.001)

(Significance Level)

for growth need strength-core job characteristics relationships closely paralleled the weak results reported in this study.

Furthermore, there was a strong correlation (r = .68) between general satisfaction and satisfaction with the work itself. However, both of these satisfaction measures exhibited a weak relationship with perceived performance (r = .13, and r = .18, respectively).

An unexpected result was the positive correlation between social need strength and growth need strength (r = .48). This result was contrary to the outcome postulated by Hackman and Lawler (1971) and Sims and Szilagyi (1976). Both of these studies postulated that social need strength and growth need strength would be negatively correlated.

Mean Scores of Variables

An examination of mean scores of job characteristics, moderators, and work outcomes (Table 4) indicated generally higher mean scores for job characteristics and general satisfaction, both in the overall sample and in the subgroups (based on high and low social or growth need strength), than were reported by Hackman and Oldham (1975), and Hackman and Lawler (1971).

For the subgroup analysis of moderating effects of growth need strength, the mean scores of the high and low

TABLE 4

MEAN SCORES OF JOB CHARACTERISTICS, MODERATORS, AND WORK OUTCOMES

Variables	Overall Mean Scores	Mean Scores High GNS Group	Mean Scores Low GNS Group	Mean Scores High SNS Group	Mean Scores Low SNS Group
Skill Variety	5.0102	5.2039	4.7159	5.1901	4.8289
Task Identity	5.0251	5.2479	4.8928	5.1778	4.9089
Task Significance	5.3714	5.3554	5.3188	5.6519	5.0822
Autonomy	5.0845	5.4187	4.9188	5.1605	5.0089
Feedback from the Job Itself	5.0966	5.2920	4.7913	5.3111	4.8956
Motivating Potential Score	144.6156	165.3263	127.4170	159.5433	131.5283
Log of Motivating Potential Score	2.0699	2.1127	2.0191	2.1065	2.0322
Social Need Strength	5.4285	6.7328	3.9449	6.0506	3.2907
Growth Need Strength	4.5125	5.1983	3.8157	5.8785	4.8700
General Satisfaction (JDS)	5.1142	5.0964	5.1681	5.3062	4.9822
	n = 359	n = 121	n = 115	n = 135	n = 150

TABLE 4 (continued)

Variables	Overall Mean Scores	Mean Scores High GNS Group	Mean Scores Low GNS Group	Mean Scores High SNS Group	Mean Scores Low SNS Group
Satisfaction with the Work Itself (JDI)	33.3733	34.4050	32.7478	34.8815	32.4400
Perceived Performance	3.8083	3.7921	3.8246	3.8560	3.7901
	n = 359	n = 121	n = 115	n = 135	n = 150

groups were lower than that reported by Sims and Szilagyi (1976) and Hackman and Lawler (1971). However, they were much less skewed ($\bar{x}_{GNS\ High} = 5.19$, $\bar{x}_{GNS\ Low} = 3.82$) in this study. Therefore, generally less positive relationships would be expected between satisfaction, perceived performance, and job characteristics for the subgroups.

Moderating Effects of Growth Need Strength

The results of the analysis of GNS are presented in three sections. The results of moderated regression analysis are shown. Next, the results of subgroup analysis are shown. Finally the moderating effects of GNS are summarized.

The results of the moderated regression analysis of GNS are shown in Tables 5 through 10. The analysis for satisfaction shows GNS acting as a moderator in skill variety-satisfaction relationship for both satisfaction with the work itself (JDI satisfaction) and general satisfaction (JDS satisfaction). In addition, GNS acts as a moderator in the task significance-general satisfaction (JDS satisfaction) relationship. GNS did not show a significant moderating effect on the MPS-satisfaction relationship although the trend was apparent in the MPS-satisfaction with the work itself (JDI satisfaction) relationship. The analysis for perceived

TABLE 5

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	$- R^2$	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDS Satisfaction						
1. Skill Variety	.2839	.0806	.0806			
2. GNS	.2912	.0848	.0042	1.649	6.001**	10.319**
3. Skill Variety * GNS	.3326	.1106	.0258			
Regression on JDS Satisfaction						
1. Task Identity	.1987	.0395	.0395			
2. GNS	.2037	.0415	.0020	.732	1.007	1.282
3. Task Identity * GNS	.2119	.0449	.0034			
Regression on JDS Satisfaction						
1. Task Significance	.4272	.1825	.1825			
2. GNS	.4284	.1835	.0010	.449	2.866	5.277**
3. Task Significance * GNS	.4422	.1955	.0120			

Note. n = 359, *p<.05, **p< .01

(See following page.)

Note.

The interpretation of the results of moderated regression presented in Tables 5 through 10 is as follows:

The column titled "Independent Variables" entered into the regression is cumulative. The first regression contains only Variable 1 (example: Skill Variety). The second regression contains Variable 1 and Variable 2 (example: Skill Variety and GNS). The third regression contains Variable 1, Variable 2, and Variable 3 (example: Skill Variety, GNS, and Skill Variety * GNS).

The asterisk used in the notation for the third variable, the moderating term, is to indicate that the third variable is the multiplicative product of Variable 1 and Variable 2.

The F values shown in the column titled "F(DIFF) Between Regressions" are values of F calculated according to Cohen (1968). The test is for differences between R^2 values. F(2-1) is the test statistic for the difference between Regression 2 (which contains Variable 1 and Variable 2) and Regression 1 (which contains only Variable 1). F(3-1) is the test statistic between Regression 3 (which contains Variable 1, Variable 2, and Variable 3) and Regression 1. F(3-2) is the test statistic for the difference between Regression 3 and Regression 2.

If F(3-2) is significant, it is an indication of moderating action.

TABLE 6

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDS Satisfaction						
1. Autonomy	.2805	.0787	.0787			
2. GNS	.2912	.0848	.0061	2.361	1.424	.489
3. Autonomy * GNS	.2933	.0860	.0012			
Regression on JDS Satisfaction						
1. Feedback	.3766	.1418	.1418			
2. GNS	.3821	.1460	.0042	1.759	.877	0
3. Feedback * GNS	.3821	.1460	0			
Regression on JDS Satisfaction						
1. Log MPS	.4208	.1771	.1771			
2. GNS	.4272	.1825	.0054	2.356	1.339	.326
3. Log MPS * GNS	.4280	.1832	.0007			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 7

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDI Satisfaction						
1. Skill Variety	.4944	.2444	.2444			
2. GNS	.4948	.2448	.0004	.179	3.676*	7.170**
3. Skill Variety * GNS	.5097	.2598	.0150			
Regression on *JDI* Satisfaction						
1. Task Identity	.3575	.1278	.1278			
2. GNS	.3615	.1307	.0029	1.184	.742	.303
3. Task Identity * GNS	.3625	.1314	.0007			
Regression on JDI Satisfaction						
1. Task Significance	.4218	.1779	.1779			
2. GNS	.4301	.1850	.0071	3.128	2.245	1.360
3. Task Significance * GNS	.4337	.1881	.0031			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 8

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDI Satisfaction						
1. Autonomy	.4415	.1949	.1949			
2. GNS	.4416	.1950	.0001	.031	.791	1.550
3. Autonomy * GNS	.4455	.1985	.0035			
Regression on JDI Satisfaction						
1. Feedback	.4343	.1886	.1886			
2. GNS	.4367	.1907	.0021	.911	.494	.079
3. Feedback * GNS	.4369	.1909	.0002			
Regression on JDI Satisfaction						
1. Log MPS	.5652	.3194	.3194			
2. GNS	.5658	.3201	.0007	.346	1.466	2.545
3. Log MPS * GNS	.5700	.3249	.0048			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 9

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on Perceived Performance						
1. Skill Variety	.1539	.0237	.0237			
2. GNS	.1631	.0266	.0029	1.064	2.010	2.949
3. Skill Variety * GNS	.1860	.0346	.0080			
Regression on Perceived Performance						
1. Task Identity	.1382	.0191	.0191			
2. GNS	.1459	.0213	.0022	.786	.579	.374
3. Task Identity * GNS	.1493	.0223	.0010			
Regression on Perceived Performance						
1. Task Significance	.2095	.0439	.0439			
2. GNS	.2126	.0452	.0013	.466	.426	.387
3. Task Significance * GNS	.2149	.0462	.0010			

Note. $n = 359$, $^{*}p<.05$, $^{**}p<.01$

TABLE 10

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on Perceived Performance						
1. Autonomy	.1109	.0123	.0123			
2. GNS	.1229	.0151	.0028	1.001	1.632	2.260
3. Autonomy * GNS	.1459	.0213	.0062			
Regression on Perceived Performance						
1. Feedback	.1755	.0308	.0308			
2. GNS	.1825	.0333	.0025	.939	.518	.099
3. Feedback * GNS	.1833	.0336	.0003			
Regression on Perceived Performance						
1. Log MPS	.2170	.0471	.0471			
2. GNS	.2245	.0504	.0033	1.222	1.427	1.630
3. Log MPS * GNS	.2339	.0547	.0043			

Note. n = 359, *$p < .05$, **$p < .01$

performance shows that GNS did not act as a moderator in this sample.

The results of the subgroup analysis of GNS are shown in Table 11. The analysis for satisfaction shows GNS acting as a moderator in the skill variety-satisfaction relationship for both satisfaction with the work itself (JDI satisfaction) and general satisfaction (JDS satisfaction). GNS did not act as a moderator in the relationship of any other job characteristic to satisfaction nor did GNS moderate the Log MPS-satisfaction relationship. The analysis for perceived performance shows that GNS did not act as a moderator when using subgroup analysis.

Summary of the effects of growth need strength. Both analysis methods indicate that GNS acted as a moderator on the skill variety-general satisfaction and the skill variety-satisfaction with the work itself relationships. The moderating effects of GNS on the Log MPS-satisfaction relationship either did not appear, or did not reach statistical significance, using either type of analysis. The moderating effects of GNS on the skill variety-satisfaction relationship only appeared with (JDS satisfaction) general satisfaction, and the effect only reached significance using moderated regression.

The results of both moderated regression and subgroup analysis indicate that GNS did not act as a moderator

TABLE 11

MODERATING EFFECTS OF GROWTH NEED STRENGTH (GNS): PEARSON PRODUCT MOMENT CORRELATIONS FOR HIGH AND LOW GNS EMPLOYEES

Criterion Variables	Predictor Variables											
	Skill Variety		Task Identity		Task Significance		Autonomy		Feedback		Log MPS	
	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo
JDS Satisfaction	.420*	.117	.311	.229	.546	.387	.349	.252	.390	.391	.493	.370
	.001	.106	.001	.007	.001	.001	.001	.001	.001	.003	.001	.001
JDI Satisfaction	.576*	.318	.378	.458	.531	.425	.484	.531	.469	.492	.606	.610
	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Perceived Performance	.113	.306	.180	.147	.245	.185	.097	.243	.228	.184	.228	.298
	.108	.001	.024	.058	.003	.024	.144	.004	.006	.024	.006	.001

Note: 1. High GNS n = 121, Low GNS n = 115

2. Pearson's r is the upper number in each box. Significance of the correlation (testing H_o: $r = \emptyset$) or alpha value is the lower number.

3. Test for significant differences between two correlations was done using a Fisher's Z transformation for Pearson's r (testing H_o: $r_1 = r_2$).

*Alpha < .05

in the job characteristics-perceived performance relationship in this sample.

Moderating Effects of Social Need Strength

The results of the analysis of social need strength (SNS) are presented in three sections. The results of moderated regression analysis are shown first. Next, the results of subgroup analysis are shown. Finally, the moderating effects of SNS are summarized.

The results of the moderated regression analysis of SNS are shown in Tables 12 through 17. The analysis for satisfaction shows SNS acted as a moderator in the Log MPS-satisfaction with the work itself (JDI satisfaction) relationship. However, SNS acted as an additional predictor in the Log MPS-general satisfaction (JDS satisfaction) relationship. SNS acted as a moderator in only one of the job characteristic-satisfaction relationships: task significance to general satisfaction (JDS satisfaction). SNS acted as an independent predictor of satisfaction in four of the relationships between job characteristics and satisfaction. SNS showed significant independent explanatory power in the relationships of autonomy, feedback, and skill variety to general satisfaction (JDS satisfaction), and in the relationships of task identity and autonomy to satisfaction with the work itself (JDI satisfaction). The analysis for perceived performance showed that SNS did not

TABLE 12

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDS Satisfaction						
1. Skill Variety	.2839	.0806	.0806			
2. SNS	.3130	.0980	.0174	6.875**	4.106*	1.331
3. Skill Variety * SNS	.3184	.1014	.0034			
Regression on JDS Satisfaction						
1. Task Identity	.1987	.0395	.0395			
2. SNS	.2437	.0594	.0199	7.520**	3.767*	.034
3. Task Identity * SNS	.2439	.0595	.0001			
Regression on JDS Satisfaction						
1. Task Significance	.4272	.1825	.1825			
2. SNS	.4335	.1879	.0054	2.389	4.073*	5.726**
3. Task Significance * SNS	.4481	.2008	.0129			

Note. n = 359, *$p < .05$, **$p < .01$

(See following page.)

Note.

The interpretation of the results of moderated regression presented in Tables 12 through 17 is as follows:

The column titled "Independent Variables" entered into the regression is cumulative. The first regression contains only Variable 1 (example: Skill Variety). The second regression contains Variable 1 and Variable 2 (example: Skill Variety and SNS). The third regression contains Variable 1, Variable 2, and Variable 3 (example: Skill Variety, SNS, and Skill Variety * SNS).

The asterisk used in the notation for the third variable, the moderating term, is to indicate that the third variable is the multiplicative product of Variable 1 and Variable 2.

The F values shown in the column titled "F(DIFF) Between Regressions" are values of F calculated according to Cohen (1968). The test is for differences between R^2 values. F(2-1) is the test statistic for the difference between Regression 2 (which contains Variable 1 and Variable 2) and Regression 1 (which contains only Variable 1). F(3-1) is the test statistic between Regression 3 (which contains Variable 1, Variable 2, and Variable 3) and Regression 1. F(3-2) is the test statistic for the difference between Regression 3 and Regression 2.

If F(3-2) is significant, it is an indication of moderating action.

TABLE 13

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDS Satisfaction						
1. Autonomy	.2805	.0787	.0787			
2. SNS	.3118	.0972	.0185	7.307**	3.758*	.224
3. Autonomy * SNS	.3127	.0978	.0006			
Regression on JDS Satisfaction						
1. Feedback	.3766	.1418	.1418			
2. SNS	.3938	.1551	.0133	5.604*	2.852	.114
3. Feedback * SNS	.3942	.1554	.0003			
Regression on JDS Satisfaction						
1. Log MPS	.4208	.1771	.1771			
2. SNS	.4379	.1918	.0147	6.493*	3.327*	.176
3. Log MPS * SNS	.4384	.1922	.0004			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 14

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDI Satisfaction						
1. Skill Variety	.4944	.2444	.2444			
2. SNS	.5025	.2525	.0081	3.834	2.400	.967
3. Skill Variety * SNS	.5045	.2545	.0020			
Regression on JDI Satisfaction						
1. Task Identity	.3575	.1278	.1278			
2. SNS	.3726	.1388	.0110	4.556*	3.514*	2.453
3. Task Identity * SNS	.3804	.1447	.0059			
Regression on JDI Satisfaction						
1. Task Significance	.4218	.1779	.1779			
2. SNS	.4244	.1801	.0022	.981	1.082	1.182
3. Task Significance * SNS	.4276	.1828	.0027			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 15

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on JDI Satisfaction						
1. Autonomy	.4415	.1949	.1949			
2. SNS	.4527	.2049	.0100	4.468*	2.355	.250
3. Autonomy * SNS	.4532	.2054	.0005			
Regression on JDI Satisfaction						
1. Feedback	.4343	.1886	.1886			
2. SNS	.4420	.1954	.0068	3.013	2.148	1.280
3. Feedback * SNS	.4453	.1983	.0029			
Regression on JDI Satisfaction						
1. Log MPS	.5652	.3194	.3194			
2. SNS	.5713	.3264	.0070	3.710	5.554*	7.332**
3. Log MPS * SNS	.5832	.3401	.0137			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 16

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on Perceived Performance						
1. Skill Variety	.1539	.0237	.0237			
2. SNS	.1977	.0391	.0154	5.726*	2.957	.207
3. Skill Variety * SNS	.1992	.0397	.0006			
Regression on Perceived Performance						
1. Task Identity	.1382	.0191	.0191			
2. SNS	.1881	.0354	.0163	5.986*	3.774*	1.552
3. Task Identity * SNS	.1990	.0396	.0042			
Regression on Perceived Performance						
1. Task Significance	.2095	.0439	.0439			
2. SNS	.2313	.0535	.0096	3.592	1.918	.252
3. Task Significance * SNS	.2328	.0542	.0007			

Note. n = 359, *$p < .05$, **$p < .01$

TABLE 17

RESULTS OF MODERATED REGRESSION ANALYSIS

Independent Variables Entered into Regression	Simple R	R^2	ΔR^2	F(DIFF) Between Regressions F(2-1)	F(3-1)	F(3-2)
Regression on Perceived Performance						
1. Autonomy	.1109	.0123	.0123			
2. SNS	.1703	.0290	.0167	6.086*	3.715*	1.339
3. Autonomy * SNS	.1806	.0326	.0036			
Regression on Perceived Performance						
1. Feedback	.1755	.0308	.0308			
2. SNS	.2117	.0448	.0140	5.210*	3.378*	2.338
3. Feedback * SNS	.2258	.0510	.0062			
Regression on Perceived Performance						
1. Log MPS	.2170	.0471	.0471			
2. SNS	.2478	.0614	.0143	5.405*	2.854	.314
3. Log MPS * SNS	.2994	.0622	.0008			

Note. n = 359, *$p < .05$, **$p < .01$

act as a moderator in this sample. SNS acted as a significant predictor of perceived performance but the percent explained variance was very small in all cases.

The results of the subgroup analysis of SNS are shown in Table 18. These results show that SNS did not act as a moderator in any of the relationships of interest in this sample.

Summary of the effects of social need strength. Only the moderated regression analysis indicated any moderating effects of SNS. Moderated regression analysis indicates that SNS acted as a moderator in Log MPS-satisfaction with the work itself (JDI satisfaction) relationship. Subgrouping shows the trend in that relationship, but the trend does not reach significance. Moderated regression also indicated that SNS acted as a moderator in the task significance-general satisfaction (JDS satisfaction) relationship. However, the trend is not clearly defined in the subgroup analysis of that relationship.

TABLE 18

MODERATING EFFECTS OF SOCIAL NEED STRENGTH (SNS): PEARSON PRODUCT MOMENT CORRELATIONS FOR HIGH AND LOW SNS EMPLOYEES

Criterion Variables	Predictor Variables											
	Skill Variety		Task Identity		Task Significance		Autonomy		Feedback		Log MPS	
	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo
JDS Satisfaction	.316	.223	.191	.221	.469	.391	.343	.290	.393	.342	.446	.389
	.001	.003	.013	.003	.001	.001	.001	.001	.001	.001	.001	.001
JDI Satisfaction	.544	.399	.343	.431	.498	.363	.533	.464	.446	.449	.587	.589
	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Perceived Performance	.057	.200	.035	.120	.149	.215	.165	.067	.254	.108	.241	.186
	.254	.007	.342	.072	.042	.004	.028	.206	.002	.093	.002	.011

Note: 1. High SNS n = 135, Low SNS n = 150

2. Pearson's r is the upper number in each box. Significance of the correlation (testing H_o: $\underline{r} = \emptyset$) or alpha value is the lower number.

3. Test for significant differences between two correlations was done using a Fisher's Z transformation for Pearson's r (testing H_o: $\underline{r}_1 = \underline{r}_2$).

*Alpha $<$ .05

CHAPTER 5

FINDINGS AND CONCLUSIONS

The results reported in Chapter Four generally did not support the hypotheses or research questions posed in this study. These results suggest the need to re-evaluate the basic relationships between job characteristics and job satisfaction-perceived performance, and to re-examine the effects of growth needs and social needs on the job characteristics-satisfaction and performance relationships.

Discussion of Hypotheses Findings

Relationship between job characteristics and job satisfaction. The basic relationships between job characteristics and job satisfaction (Table 3a) generally supported the results of Hackman and Lawler (1971, p. 276), Brief and Aldag (1975, p. 183), and Hackman and Oldham (1976, p. 263).

The results obtained by this study indicate that a positive relationship exists between job characteristics and and job satisfaction; however, the strength of these relationships was not always great enough to satisfy the criteria that at least 20% of the variation of job satisfaction be explained by the introduction of a predictor variable (job characteristic or MPS). None of the relationships

between the individual job characteristics and general satisfaction (JDS) met the acceptance criteria. Although the MPS-general satisfaction (JDS) relationship indicated a significant trend (18% explained variation), it was not sufficient to meet the acceptance criteria.

Comparatively, the relationship between the job characteristics and satisfaction with the work itself (JDI) were positive, with the MPS meeting the overall acceptance criteria. Since the JDI measure of satisfaction is more specific in addressing satisfaction with the work itself, the MPS was expected to exhibit stronger explanatory power than when used with the JDS measure of general satisfaction.

Additionally, overall stronger relationships were found among the individual job characteristics-job satisfaction relationships using the JDI measure of satisfaction than using the JDS measure (Table 3a).

The results generally supported Hypothesis One. There was a positive relationship found between job characteristics and job satisfaction (using both satisfaction measures). However, qualification of this support is necessary; the individual job characteristics did not in all cases produce equally predictive results. Specifically, the majority of the individual job characteristics did not achieve sufficient explanatory power to pass the acceptance criteria

used for this study. Furthermore, the resulting difference in the ability of job characteristics to predict job satisfaction (R^2 values), using general satisfaction (JDS) and satisfaction with the work itself (JDI), was expected, the JDI measure was predicted to be the stronger of the two.

This qualified support can be explained by considering the measures of satisfaction. The JDI-satisfaction with the work itself is more directly work related; it specifically measures worker satisfaction with the content of the job (Smith et al., 1969). Therefore, the JDI measure of satisfaction, intuitively, would have a strong relationship with job characteristics. By comparison, the JDS-general satisfaction measures the degree the individual is satisfied and happy with his work (Hackman & Oldham, 1975); therefore, it may include other external influences that are not directly related to job characteristics. The inclusion of non-related external influences to the JDS measure of satisfaction would understandably reduce the explanatory power of job characteristics to predict general satisfaction.

The relationship between job characteristics and perceived performance. Job characteristics generally exhibited little explanatory power for predicting perceived performance. This finding supported the results obtained by Umstot et al. (1976), and Hackman and Lawler (1971) in which extremely weak relationships were found between job

characteristics and perceived performance.

In this study the introduction of individual job characteristics resulted in explained variations ranging from 1% to 4%, with MPS producing only a 5% explained variation. These values, although positive, were insufficient to meet the 20% explained variation criteria for acceptance of Hypothesis Three.

This finding was expected, although the outcome of increased levels of job characteristics leading to increased levels of work performance has considerable intuitive appeal. As Hackman and Oldham (1976) explained, it may be that an individual's level of work performance is more causally remote from job characteristics than is an individual's level of job satisfaction; therefore, work performance is affected less by job characteristics. Additionally, as found in this study, the relationships involving performance may have been weakened because of the difficulty in obtaining adequate and comparable measures of performance.

Growth need strength moderation of the job characteristics-job satisfaction relationship. The conceptualization of GNS as a moderator of the job characteristics-job satisfaction relationship has considerable intuitive appeal. To accommodate individual differences in a theory of job design rather than assume that all individuals have the same

response to their jobs is more consistent with a psychological approach to studying job design. However, GNS in this study did not reach significance as a moderator in the job characteristics-job satisfaction relationship. The results strongly suggest that GNS may not operate as a moderator in all samples. This same conclusion was made after applying both moderated regression and subgroup analysis to test the relationship. This finding was in contrast to the studies conducted by Hackman and Lawler (1971), Wanous (1974), Hackman and Oldham (1976), and Sims and Szilagyi (1976).

These earlier studies found that GNS moderated the job characteristics-job satisfaction relationship; however, this may have resulted from the highly skewed GNS scores. Specifically, Hackman and Lawler (1971) and Sims and Szilagyi (1976) reported respective sample mean GNS scores of 6.01 and 6.48. The sample mean GNS score for this study was considerably lower, 4.51, indicating a sample of individuals who were generally less desirous of higher growth needs.

This comparison suggests that GNS may act as a moderator of the job characteristic-job satisfaction relationship, but only for individuals with an extremely high GNS. The relatively low mean GNS score could account for the minimal moderating effect shown by GNS in this study.

However, there were some exceptions. GNS moderated the relationship between skill variety and both general satisfaction (JDS) and satisfaction with the work itself (JDI).

Additionally, the moderating effect reached significance in both moderated regression and subgroup analysis. A possible explanation for this effect is the individual's perception of jobs requiring the use of many different skills or techniques as being more related to growth needs than jobs having little variety.

Additionally, GNS moderated the relationship of task significance and general satisfaction (JDS). The relationship was only significant using moderated regression, although the trend was toward significance in the subgroup analysis. The moderating effect was not as pronounced using satisfaction with the work itself and did not reach significance in either moderated regression or subgroup analysis. Therefore, the results of GNS as a moderator on the task significance-job satisfaction relationship were not as conclusive as the results obtained for skill variety. However, the measure of task significance, which considers the degree the job impacts on the lives of individuals, may be more directly related to the "need for worthwhile accomplishment" aspect of the growth need strength measure. Worthwhile accomplishment may act by increasing feelings of general satisfaction toward the job while allowing the possibility for the worker to be dissatisfied with the work itself.

Therefore, the results did not support Hypothesis Two, except for the relationships involving skill variety and task significance which did show a moderating influence.

Growth need strength moderation of the job characteristics-perceived performance relationship. Again, the relationship between job characteristics and perceived performance was initially so weak as to be inconsequential. The effect of introducing growth need strength as a moderator of this weak relationship added no significant increase to the explanatory power of job characteristics.

There was no support for Hypothesis Four. This lack of support is in agreement with the findings of Umstot et al. (1976) and Hackman and Lawler (1971).

Research Questions: Discussion and Findings

The effect of social needs on the basic job characteristics-job satisfaction relationship has been only postulated (Hackman & Lawler, 1971; Sims & Szilagyi, 1976). There have been no previous tests on whether or not individual social needs may actually influence an individual's response to the job, or what that influence might be. The research questions posed by this study generally found little support for social need strength as either a moderator or a predictor variable.

Does social need strength effect the job characteristics-job satisfaction relationship? The effect of social need strength was analyzed using both moderated regression and subgroup analysis. Social need strength did not show a strong moderating effect on the job characteristics-job satisfaction relationship with either job satisfaction measure. Specifically, the moderated regression analysis indicated that social need strength acted as a moderator only for the task significance-general satisfaction (JDS) relationship and the MPS-satisfaction with the work itself (JDI) relationship (Tables 12 and 15, respectively). Subgroup analysis did not support either of these findings, nor were any other significant moderating effects found for high and low social need strength groups.

The overall conflicting and generally weak results obtained using the two methods of analysis cannot be used to assert that social need strength effects the job characteristics-job satisfaction relationship as a moderator. Additionally, there was little evidence of social need strength acting as a predictor.

Does social need strength effect the job characteristics-perceived performance relationship? The basic relationship between job characteristics and perceived performance was extremely weak, which significantly reduced any conclusions resulting from analysis of social need strength on the relationship. The results of subgroup analysis and moderated

regression on the effect of social need strength did not produce any substantive findings, as expected. However, there was a caveat in that it appears from the moderated regression that social need strength may be a predictor of perceived performance (see Tables 16 and 17).

Further research testing social need strength as a predictor may yield more conclusive evidence. In this study, the predictor effect is viewed as a possible statistical aberration resulting from the extremely weak basic job characteristic-perceived performance relationship. When dealing with such weak relationships, any addition to explanatory power could be shown as significant. Therefore, no support was given to the effect of social need strength on the job characteristics-perceived performance relationship.

Conclusions

Contrary to earlier research, this study found no consistent moderating effect of growth need strength on either the job characteristics-job satisfaction relationship or the job characteristics-perceived performance relationship. The results may indicate the need to develop more refined measures of individual needs as suggested by Champoux (1977).

Individual social needs and growth needs were postulated to be inversely related according to Hackman and Lawler (1971) and Sims and Szilagyi (1976). This study did

not support this postulate. GNS and SNS was found to be directly related (R = .48). This implies that social needs and growth needs may be parts of one generalized individual difference variable, i.e., need to feel personal worth.

Although social need strength individually did not provide a substantive moderating effect if combined with growth need strength, the resulting need to feel personal worth may provide a more precise measure of individual differences. The need for personal worth could then be satisfied through various types of internal and external perceptions by the individual, such as need for personal accomplishment, need for social recognition and acceptance, and desire for personal interaction.

Although further elaboration is beyond the scope of this study, the need for personal worth may provide a basis for further research and method of enhancing the explanatory power of the basic job characteristic-job satisfaction and job characteristic-perceived performance relationships.

APPENDIX A

THE MODERATED REGRESSION TECHNIQUE

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JOB ENRICHMENT: THE EFFECTS OF GROWTH NEEDS AND SOCIAL NEEDS ON--ETC(U)
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THE MODERATED REGRESSION TECHNIQUE

Moderated regression uses a multi-variate curvilinear regression euqation involving the cross-products of moderator and predictor variables. It is a weighted regression where the weights are not constant but are some linear function of the moderator variable (s).

Moderated regression provides a means of maintaining population integrity while still maintaining a statistical control on each individual's membership in one of a continuous, infinite, series of subpopulations defined by his score on the moderator (Saunders, 1956).

The mathematical formulation of moderated regression was developed from ordinary linear regression by D. R. Saunders in 1956. Zedeck (1971) applied the procedure to behavioral research and proposed the method of application this study will use.

The moderated regression as developed from general linear regression (Saunders, 1956) is as follows:

$$\hat{y} = k + \sum_i a_i x_i \qquad (1)$$

Substituting for each a_i a linear function of a moderating variable (GNS, SNS), z_i which is supposed to influence the efficiency of the predictor variable, the equation takes the form:

$$\hat{y} = k + \sum_i (b_{ji} z_j)\, x_i \qquad (2)$$

The z_i is the moderator variables. This equation may be reduced and re-written as follows:

$$\hat{y} = k + \sum_i a_i x_i + \sum_j b_j z_j + \sum_{i,j} c_{ij} x_i z_j \qquad (3)$$

This is the general form of the moderated regression equation (the a's, b's, and c's are new constants in Equation 3). The equation is convenient to use in that once the cross-products ($x_i z_j$) are calculated, procedures for fitting the equation to experimental data are commonly available, i.e., SPSS. Additionally, no squared terms and no terms higher than quadratic are involved. Only the multiplicative terms containing one moderator (z_j) and one predictor (x_i) are involved. The quation form is invariant under linear changes in the scale of measurement of any of the predictors despite the multiplicative terms (Saunders, 1956).

The geometric interpretation of the results is as follows: any line in the regression surface parallel to the XY or YZ plane is a straight line. Lines not parallel will be parabolic (see Figure 2). The surface has the property that "if all of the predictors but one are held constant, the residual regression line is . . . [a] linear one" (Saunders, 1956, p. 212). The moderated regression model has also been called "ruled surface regression" because of this property. The entire regression surface can be generated by regular motions of a straight line.

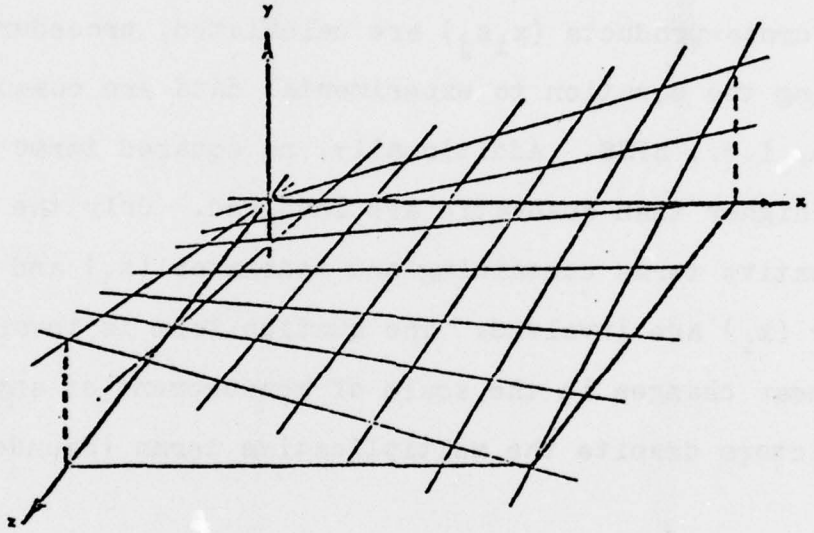

Figure 2: "Ruled Surface Regression [Saunders, 1956]"

When using one moderator and one predictor, the general form (Equation 3) can be reduced to the following form:

$$\hat{y} = k + ax + bz + c(xz) \qquad (4)$$

where,

k is a constant

x is the predictor variable

z is the moderator variable

a, b, c are regression coefficients

The dual function of the moderator variable can be clearly seen in this simplified form. In the third term, bz, the moderator, is treated as a second predictor. In the fourth (interaction) term c(xz), the moderator, is treated as a changing weight.

To further examine the interaction effects, Equation 1 can be expanded:

$$\hat{y} = k + \sum_{i=1}^{2} a_i x_i \qquad (1)$$

to yield,

$$\hat{y} = k + a_i x_i + a_2 x_2 \qquad (5)$$

The a_i are called partial regression coefficients and reflect the partial effect of one independent variable when the other independent variable is included in the model and held constant. Considering Equation 4 again:

$$\hat{y} = k + ax + bz + cxz \qquad (4)$$

which can be re-written:

$$\hat{y} = k + b_i x + b_2 z + b_3 xz \qquad (4')$$

The meaning of b_1 and b_2 is not the same as the a's because of the cross product term. The change in the mean response with a unit increase in x with z held constant is:

$$b_1 + b_2 z$$

The change in the mean response with a unit increase in z with x held constant is:

$$b_2 + b_1 x$$

The important point is that both the effect of x for a given level of z and the effect of z for a given level of x in Equation 4' depend on the level of the other independent variable. While the mean response is a linear function of x when z is held constant, both the constant k (Y intercept) and the slope change as the level of z is varied.[3] This is the effect of the moderating variable:

Application of Moderated Regression

Zedeck's (1971) procedure for application of moderated regression involves computation of three regression equations:

$$\hat{y} = k + b_1 x \qquad (5)$$

$$\hat{y} = k + b_1 x + b_2 z \qquad (6)$$

$$\hat{y} = k + b_1 x + b_2 z + b_3 xz \qquad (4')$$

The first (Equation 5) is the standard regression model with predictor x and criterion $\hat{y}$. The second is also a standard regression equation with predictor x, criterion y, and moderator z treated as a second predictor.

The final equation (4') is the moderated regression equation consisting of Equation 6 with the interaction term (cross product) b_3xz included.

The correlations, slopes and standard error of estimates may be examined for each of the equations.

> If equation (6) and equation (4') are significantly different from equation (5) but not from each other then . . . z (the suspected moderator) . . . is acting as an independent predictor and not as a moderator. (Zedeck, 1971, p. 304)

It is required that equation (4') be significantly different from both equation (5) and equation (6) to conclude that z is a moderator.

An F-test on the differences in R^2 among the three regressions is generally accepted as adequate to identify moderator variables (Cohen, 1968, p. 435). The test statistic is calculated as follows:

$$F = \frac{(R^2_{Y\cdot A,B} - R^2_{Y\cdot A})/b}{(1 - R^2_{Y\cdot A,B})/(n-a-b-1)} \qquad (7)$$

where: $R^2_{Y\cdot A,B}$ is the incremented R^2 based on a + b independent variables. That is, predicted from the combined sets of A and B variables.

$R^2_{Y\cdot A}$ is the smaller R^2 based on only a independent variables. That is, predicted from only the set of A variables.

a and b are the number of original (a) and added (b) independent variables, the number of degrees of freedom each takes up.

The F_c is taken as $F^b_{(n-a-b-1)}$ with an appropriate alpha level. (This study will use alpha = .05.)

Assumptions

In order to use the parametric tests, such as the F- and t-tests for making comparisons of sets of experimental data (Gardner, 1975; Siegel, 1956):

1. The observations must be independent.
2. The observations must be normally distributed.
3. The populations must have the same variance, i.e., be homoscedastic.
4. The variables must be measured in at least an interval scale.

Gardner (1975) in his literature review dealing with scales and statistics cites much evidence that Assumptions 2 and 3 do not have to be rigidly adhered to because of the robustness of the t statistic (and parametric statistics in general). He further stated that "under most conditions parametric statistics are highly robust" (Gardner, 1975).

The scales of measurement used in the JDS and in the untested scales used here are defined as summated scales. This scale is seen as between ordinal and interval level, but "the deviations from interval properties . . . (when

using summated scales) . . . will not be extreme" (Gardner, 1975, p. 53). Gardner (1975) also states that because of the robustness of the parametric statistics small distortions in the measurement scale will not effect the applicability of the F- and t-statistics.

If this reasoning is accepted, the last three conditions have been dealt with and, if not fully satisfied, at least they have not been violated to a degree that would invalidate the use of parametric statistics.

The observations are not independent in the strict sense. The same individuals are providing data on their perceptions of job dimensions and on their responses to those dimensions. The theory states, however, that the individual's perception of the job produces the response to it (Hackman & Lawler, 1971). Therefore, to properly apply the theory, "It is necessary to obtain measures of the relevant variables from the same individuals" (Champoux, 1976).

It is necessary to assume that any common method variance induced by using the same individuals to measure all relevant variables will not greatly effect the results.

APPENDIX B

JOB ATTITUDE SURVEY II

JOB ATTITUDE SURVEY II

In August of 1975, a randomly selected group of employees completed a Job Attitude Survey as part of the Human Resources Development program sponsored by the Industrial Engineering Support Division (XRS) of the Plans and Programs Office.

The survey was designed to provide employees with an opportunity to express their opinion about various aspects of their work. The responses of each individual were anonymous and were analyzed by combining them with all other individuals taking the survey. Information pertaining to the Center as a whole was presented to the Commander and his staff, followed by a series of meetings with a sample of supervisors during which those supervisors received a summary of the attitudes of those employees they supervise. At no time were any responses identified to an individual.

Because people's opinions can change over time, this second survey is given today and others will be given in the future. This survey marks the beginning of what is called a Survey Feedback process. It is designed to provide you with opportunities to state your feelings on issues which affect your work here at and then to work towards positive change. Your responses to this survey will be processed by automatic equipment which summarize the answers in statistical form so that individuals cannot be identified. Aggregate data pertaining to the Center as a whole will be presented first to the Commander and his staff. Following that, each participating supervisor will receive a summary of the attitudes of the employees he supervises. Each supervisor will then feed back that information to his subordinates, followed by a series of action-planning sessions during which supervisor and subordinates work together in a cooperative effort to make positive change in those areas identified in the survey.

While it cannot be guaranteed that all of the problems identified in this survey will be resolved, it can be guaranteed that they will receive the attention of at least your supervisor; and your work group will have an opportunity to discuss them with your supervisor in an effort to work out solutions. Additionally, if your work group discusses problems and solutions requiring the attention of those higher up in the chain of command, it can be guaranteed that that attention will be given.

The researchers and the management of AGMC make three commitments to you as a respondent:

1. Your individual responses to the survey will not be identified with you personally and will not be reported in the results.

2. The survey results for your work group will not be shared with the members of any other work group.

3. The survey results for your work group will be fed back to you by your supervisor.

To assist us in keeping your individual responses confidential, please do not put your name anywhere on the survey or the answer sheet. It should take you no more than one hour to complete all of the items. If you have questions of any sort, please feel free to ask them. When you are finished, please return the survey and the answer sheet to the survey administrator.

Finally, if you wish to make any comments about specific questions or about the survey itself, we are interested in reading them. Please use the bottom and/or back of this page. Thank you for your cooperation. We appreciate it.

PRIVACY ACT STATEMENT

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information is provided as required by the Privacy Act of 1974:

a. This survey information is authorized for solicitation by Federal Statute Title 10, United States Code, Section 8012, Executive Order 9397, 22 Nov 43, DODI 1100.13, 17 Apr 68, and AFR 178-9, 9 Oct 73.

b. The principal purpose for which this survey will be used is to measure specific motivational aspects of your work in an effort to allow for positive change where possible.

c. Routine use in addition to the above will include utilization of these data in the conduct of Air Force research in the area of organizational change.

d. Participation in this survey is voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

INSTRUCTIONS

A. If this Survey Feedback process is to be helpful, it is very important that you answer each question as thoughtfully and frankly as possible. This is not a test and there are no right or wrong answers.

B. Please answer all questions in order.

C. All of the questions in the survey can be answered by filling in one of the answer spaces for each question ON THE ANSWER SHEET provided. If you do not find the exact answer that fits your case, use the one that is closest to it. DO NOT fill in more than one answer space for each question.

D. This survey is designed for automatic scanning of your responses. You answer each question by marking the appropriate space ON THE ANSWER SHEET, as in this example:

Example:

Found in the survey	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
81. It never rains in Newark, Ohio.	1	2	3	4	5	6	7

Found on the answer sheet

	1	2	3	4	5	6	7	8	9	10
81.	▮	‖	‖	‖	‖	‖	‖	‖	‖	‖

E. Please use the pencil provided and observe carefully these important requirements:

- Make your pencil marks on the answer sheet heavy and fill in the entire space.
- Erase cleanly any answer you wish to change.
- Make no stray pencil markings of any kind.

F. Please notice that on the answer sheet the numbering of the questions run from left to right rather than from top to bottom.

G. Remember, the value of the Survey Feedback process depends upon your being straightforward and candid in answering these questions in this survey. No attempt will be made to identify an individual with a particular set of responses.

DEMOGRAPHIC DATA

Please turn the answer sheet clockwise so that its right side (when upright) becomes the bottom. Located in the bottom righthand corner you will find a block of 20 columns. All of the demographic data will be coded in this block.

A. The first demographic datum required is the last four digits of your Social Security Number. This information is required for two reasons. First, since two answer sheets are required, the researchers must retain a way to identify any two of them as belonging to the same respondent. Secondly, analyzing individual response over time is an essential part of the Survey Feedback process. The best way to do this without losing anonymity and violating an individual's privacy is to use only the last four digits of the social security number. Please now code these four numbers in the first four columns.

B. In the very next column (the 5th) shade in an 0 if you are a male or a 1 if you are a female.

C. In the next column (the 6th), shade in the space corresponding to one of the numbers below which best describes your age.

1	2	3	4	5	6	7
under 20	20-24	25-29	30-39	40-49	50-59	60 and over

D. In the next column (the 7th), shade in an 0 if you are married or a 1 if you are single.

E. In the next two columns (the 8th and 9th), shade in the two digit code representing your ROC that will be provided to you by the survey administrator.

F. In the next column (the 10th), shade in the space corresponding to one of the numbers below which best describes your ethnic (racial) group.

1	2	3	4	5	6
Native American (Indian)	Caucasian	Black American	Latino	Oriental American	Other

G. If you are a civilian and possess a General Schedule grade, then in the next column (the 11th), shade in the space corresponding to one of the numbers below which best describes your civilian grade. (Note: if you possess a GS grade of 6, 8 or 10, respond as if you were in the next highest grade.)

1	2	3	4	5	6	7	8	9	10
GS 1 thru 3	GS4	GS5	GS7	GS9	GS11	GS12	GS13	GS14	GS15

H. If you are a civilian and possess a Wage Board grade, then in the next column (the 12th), shade in the space corresponding to one of the numbers below which best describes your civilian grade.

1	2	3	4	5	6	7	8	9	10
WB 1 thru 4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	WB13

I. If you are a civilian and possess a Wage Supervisor grade, then in the next column (the 13th), shade in the space corresponding to one of the numbers below which best describes your civilian grade.

1	2	3	4	5	6	7	8	9	10
WS 4 thru 7	WS8	WS9	WS10	WS11	WS12	WS13	WS14	WS15	WS16

J. If you are in the military, then in the next column (the 14th), shade in the space corresponding to one of the numbers below which best describes your <u>military rank</u>.

1	2	3	4	5	6	7	8	9
Bottom 3 Airmen	Middle Three (Buck-Tech)	Top Three (Master-Chief)	2LT	1LT	CAPT	MAJ	LTC	COL

K. In the next column (the 15th), shade in a 0 if you have any employees officially under your <u>supervision</u> or a 1 if you do not.

L. In the next column (the 16th), shade in the space corresponding to one of the numbers below which best describes the <u>highest level of education</u> you have received.

1	2	3	4	5	6	7
Some High School	High School Diploma	Some College or Technical School	College or Technical School Degree	Some Graduate School	Some Master's Work	Master's or Higher Degree

M. In the next column (the 17th), shade in the space corresponding to one of the numbers below which best describes your <u>time in service</u>.

1	2	3	4	5	6	7
under 5	5-10	10-15	15-20	20-25	25-30	over 30

N. In the next column (the 18th), shade in the space corresponding to one of the numbers below which best describes the <u>number of years</u> you have <u>worked at AGMC</u>.

1	2	3	4	5	6	7
under 5	5-10	10-15	15-20	20-25	25-30	over 30

O. In the next column (the 19th), shade in the space corresponding to one of the numbers below which best describes <u>how many more years</u> you <u>would like to work at AGMC</u>.

1	2	3	4	5	6	7
0-1	2-3	3-5	5-10	10-15	15-20	20 and over

P. The next column (the 20th) should be blank.

PUT ANSWERS ON THE ANSWER SHEET

SECTION ONE

This part of the questionnaire asks you to describe your job as objectively as you can.

Please do not use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

A sample question is given below.

Sample: To what extent does your job require you to work with mechanical equipment?

1------2------3------4------5------6------7

Very little; the job requires almost no contact with mechanical equipment of any kind.	Moderately	Very much; the job requires almost constant work with mechanical equipment.

If, for example, your job requires you to work with mechanical equipment a good deal of the time--but also requires some paperwork--you might select the number six. You would then shade the number six ON THE ANSWER SHEET beside the number corresponding to this question number.

Remember, the numbering of questions runs from left to right and not from top to bottom.

1. To what extent does your job require you to work closely with other people (either "clients," or people in related jobs in your own organization)?

1------2------3------4------5------6------7

Very little; dealing with other people is not at all necessary in doing the job.	Moderately; some dealing with others is necessary.	Very much; dealing with other people is an absolutely essential part of doing the job.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

2. How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

1------2------3------4------5------6------7

Very little; the job gives me almost no personal "say" about how and when the work is done.	Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work.	Very much; the job gives me almost complete responsibility for deciding how and when the work is done.

3. To what extent does your job involve doing a "whole" and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

1------2------3------4------5------6------7

My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service.	My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome.	My job involves doing the whole piece of work, from start to finish; the results of my activities are easily seen in the final product or service.

4. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?

1------2------3------4------5------6------7

Very little; the job requires me to do the same routine things over and over again.	Moderate variety.	Very much; the job requires me to do many different things, using a number of different skills and talents.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

5. In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

1------2------3------4------5------6------7

Not very significant; the outcomes of my work are not likely to have important effects on other people.	Moderately significant.	Highly significant; the outcomes of my work can affect other people in very important ways.

6. To what extent do managers or co-workers let you know how well you are doing on your job?

1------2------3------4------5------6------7

Very little; people almost never let me know how well I am doing.	Moderately; sometimes people may give me "feedback;" other times they may not.	Very much; managers or co-workers provide me with almost constant "feedback" about how well I am doing.

7. How clear and specific are the goals for your job? That is, do you know the specific goals you are expected to accomplish?

1------2------3------4------5------6------7

Not very clear; I do not know what the goals are.	Somewhat clear; although the goals are not specific, I think I know what the goals are.	Very clear; I know exactly what the goals are.

8. To what extent does doing the job itself provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing--aside from any "feedback" co-workers or supervisors may provide?

1------2------3------4------5------6------7

Very little; the job itself is set up so I could work forever without finding out how well I am doing.	Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not.	Very much; the job is set up so that I get almost constant "feedback" as I work about how well I am doing.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

9. To what extent do you continue working toward a goal even when it becomes difficult?

1------2------3------4------5------6------7

Very little; I give up quickly if I can't reach the goal.	Moderately; I usually continue working toward a goal once I start.	Very much; once I accept a goal I rarely give up no matter how difficult it gets.

10. What degree of influence do you have in determining your work objectives or goals?

1------2------3------4------5------6------7

Very little; I have no say in the goals set for my job.	Moderate; I have some influence over the goals for my job.	Very much; I have a great deal of influence over the goals for my job.

11. To what extent do you accept the work objectives or goals for your job?

1------2------3------4------5------6------7

Very little; I ignore the goals and do as I please.	Moderately; I sometimes accept the goals.	Very much; I accept almost all goals.

12. To what extent are your goals or work objectives difficult to accomplish?

1------2------3------4------5------6------7

Very easy; I can accomplish the goals with minimum effort.	Moderately difficult to accomplish.	Very difficult; the goals are almost impossible to accomplish.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION TWO

Listed below are a number of statements which could be used to describe a job.

You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Once again, please try to be as objective as you can in deciding how accurately each statement describes your job--regardless of whether you like or dislike your job.

Use the following scale for all the items in Section Two (13 thru 26). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

13. The job requires me to use a number of complex or high-level skills.

14. The job requires a lot of cooperative work with other people.

15. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.

16. Just doing the work required by the job provides many chances for me to figure out how well I am doing.

17. The job is quite simple and repetitive.

18. The job can be done adequately by a person working alone--without talking or checking with other people.

19. The supervisors and co-workers on this job almost never give me any "feedback" about how well I am doing in my work.

20. This job is one where a lot of other people can be affected by how well the work gets done.

21. The job denies me any chance to use my personal initiative or judgment in carrying out the work

22. Supervisors often let me know how well I am performing the job.

23. The job provides me the chance to finish the pieces of work I begin.

24. The job itself provides very few clues about how well I am performing.

25. The job gives me considerable opportunity for independence and freedom in how I do the work.

26. The job itself is not very significant or important in the broader scheme of things

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION THREE

Do you have goals or work objectives for your job?

If your answer is NO, then go on to the next Section. However, if your answer is YES, please answer the following questions.

Listed below are a number of statements which could be used to describe your job.

You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Once again, please try to be as objective as you can in deciding how accurately each statement describes your job--regardless of whether you like or dislike your job.

Use the following scale for all the items in Section Three (27 thru 40). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

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

28. My objectives are clearly stated with respect to the results expected.

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

30. I wish I had better knowledge of whether I'm achieving my objectives.

31. It is very easy to reach my work objectives or goals.

32. I need more feedback on whether I'm achieving my objectives or not.

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

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

35. The goals for this job are almost impossible to accomplish.

36. I have little say in the formulation of my work goals.

37. The relative importance of all my objectives or goals is unclear.

38. Setting the work goals for my job is pretty much under my control.

39. I know exactly what is expected of me on this job.

40. I always have knowledge of my progress toward my objective.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION FOUR

Every employee produces something in his or her work. It may be a "product" or it may be a "service". It is sometimes difficult, however, to identify that product or service. Listed below are some of the products or services produced at AGMC.

equipment calibrated	pay vouchers	work orders
typed pages	packaging	jobs planned
contracts	technical assistance	procedures written
reports	classifications	food prepared

These are just a few of the products or services found at AGMC. There are others, of course. We would like you to think carefully of the things you produce, and also of the things produced by those people who work with you in your work group (i.e., everyone who works for your boss).

There is a scale provided for each question. Select the response number (1 thru 5) you are most comfortable with and then shade that same number ON THE ANSWER SHEET beside the number corresponding to these question numbers.

41. Thinking now of the various things produced by the people you know in your work group, how much are they producing?

1	2	3	4	5
It is very low.	It is fairly low.	It is neither high nor low.	It is fairly high.	Their production is very high.

42. How good would you say is the quality of the products or services produced by the people you know in your work group?

1	2	3	4	5
The quality is poor.	The quality is not too good.	The quality is fair.	The quality is good.	The quality is excellent.

43. Do the people in your work group seem to get maximum output from the resources (money, people, equipment, etc.) they have available? That is, how efficiently do they work?

1	2	3	4	5
They do not work efficiently at all.	Not too efficient.	Fairly efficient.	They are very efficient.	They are extremely efficient.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION FIVE

Now please indicate how you personally feel about your job.

Each of the statements below is something that a person might say about his or her job. You are to indicate your own personal **feelings** about your job by marking how much you agree with each of the statements.

Use the following scale for all the items in Section Five (44 thru 50). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

44. My opinion of myself goes up when I do this job well.

45. Generally speaking, I am very satisfied with this job.

46. I feel a great sense of personal satisfaction when I do this job well.

47. I frequently think of quitting this job.

48. I feel bad and unhappy when I discover that I have performed poorly on this job.

49. I am generally satisfied with the kind of work I do in this job.

50. My own feelings generally are not affected much one way or the other by how well I do on this job.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION SIX

Now please indicate how satisfied you are with each aspect of your job listed below.

Once again, use the following scale for all the items in Section Six (51 thru 64). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

How satisfied are you with these aspects of your job?

1	2	3	4	5	6	7
Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied

51. The amount of personal growth and development I get in doing my job.

52. The people I talk to and work with on my job.

53. The degree of respect and fair treatment I receive from my boss.

54. The feeling of worthwhile accomplishment I get from doing my job.

55. The chance to get to know other people while on the job.

56. The amount of support and guidance I receive from my supervisor.

57. The amount of independent thought and action I can exercise in my job.

58. The chance to help other people while at work.

59. The amount of challenge in my job.

60. The overall quality of the supervision I receive in my work.

61. The amount of job security I have.

62. The amount of pay and fringe benefits I receive.

63. The degree to which I am fairly paid for what I contribute to this organization.

64. How secure things look for me in the future in this organization.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION SEVEN

Listed below are a number of characteristics which could be present on any job. People differ about how much they would like to have each one present in their own jobs. We are interested in learning how much you personally would like to have each one present in your job.

Please indicate the degree to which you would like to have each characteristic present in your job. Use the scale below for all the items in Section Seven (65 thru 80). Select the appropriate respone number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

NOTE: The numbers on this scale are different from those used in previous scales, in that it does not begin at #1.

4	5	6	7	8	9	10
Would like having this only a moderate amount (or less)			Would like having this very much			Would like having this extremely much

65. Being a member of a warm, closely-knit work group, where people have the same perspective on life.

66. Opportunities for personal growth and development on the job.

67. Great job security.

68. Co-workers who let me know what they think of me.

69. Chances to exercise independent thought and action in my job.

70. Very high pay and very generous benefits.

71. Having other people around who care about me as a person.

72. Stimulating and challenging work.

73. Co-workers with whom I can share my personal concerns.

74. Quick promotions.

75. Opportunities to be creative and imaginative in my work.

76. High respect and fair treatment from my supervisor.

77. A sense of worthwhile accomplishment in my work.

78. Being able to lend a hand to others when they have trouble.

79. Opportunities to learn new things from my work.

80. Chances to work together with others in carrying out the job.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION EIGHT

You have now completed the first answer sheet. The answers to Sections Eight thru Ten will be placed on the second answer sheet. The numbering of those questions which follow begin again at #1. Check to be sure you have coded the last four digits of your SSN on the second answer sheet.

Listed below are a number of characteristics which could be present on any job. Please indicate the degree to which you feel they are present on your job.

Use the following scale for all the items in Section Eight (1 thru 21). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2	3	4	5	6	7
Never	Very Seldom	Seldom	Occasionally	Often	Very Often	Always

1. My immediate supervisor communicates often with me.
2. My immediate supervisor makes an effort to help people in the work group with their personal problems.
3. My immediate supervisor insists that members of the work group follow to the letter the standard policies and regulations handed down to him.
4. Considering Question #3 again, answer in terms of how you would like it to be.
5. Members of my work group take a personal interest in each other.
6. The communications I have with my immediate supervisor are worthwhile.
7. My immediate supervisor seeks the advice of our work group on important matters before going ahead.
8. My immediate supervisor decides in detail what shall be done and how it shall be done by the persons under him.
9. Members of my work group eat lunch together.
10. The directions and guidance I receive from my supervisor are clear, concise and understandable.
11. My immediate supervisor treats all persons in our work group as equals.
12. My immediate supervisor emphasizes the meeting of deadlines.
13. Members of my work group talk to each other about their personal problems.
14. My immediate supervisor stands up for persons under him, even when it makes him unpopular with others.
15. My immediate supervisor pushes the people under him to insure they are working up to capacity.

PUT ANSWERS ON THE ANSWER SHEET

SECTION EIGHT (CONT'D)

Use the following scale for the remaining six questions (16 thru 21) in Section Eight. Again, select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

16. There is a "group spirit" that exists amongst the members of my work group.

17. People at higher levels are in the best position to make important decisions for people below them.

18. My immediate supervisor should be given latitude in making his own decisions.

19. It is hard to get people higher up in this organization to listen to people at my level.

20. It is better to have a complete set of rules than to have to decide things for oneself.

21. Each individual should be given latitude in organizing and conducting his work.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION NINE

The following items might be used to describe the work you do on your job.

Use the scale below for all the questions in Section Nine (22 thru 39). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2	3
No, it does not describe my job.	I cannot decide.	Yes, it does describe my job.

22. My work is fascinating.
23. My work is routine.
24. My work is satisfying.
25. My work is boring.
26. My work is good.
27. My work is creative.
28. My work is respected.
29. My work is hot.
30. My work is pleasant.
31. My work is useful.
32. My work is tiresome.
33. My work is healthful.
34. My work is challenging.
35. My work keeps you on your feet.
36. My work is frustrating.
37. My work is simple.
38. My work is endless.
39. My work gives you a sense of accomplishment.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION TEN

Listed below are a number of statements concerning attitudes and traits.

Use the scale below for all the items in Section Ten (40 thru 72). Select the appropriate response number and shade it in ON THE ANSWER SHEET next to the corresponding question number.

1	2
True	False

40. Before voting I thoroughly investigate the qualifications of all the candidates.

41. I never hesitate to go out of my way to help someone in trouble.

42. It is sometimes hard for me to go on with my work if I am not encouraged.

43. I have never intensely disliked anyone.

44. On occasion I have had doubts about my ability to succeed in life.

45. I sometimes feel resentful when I don't get my way.

46. I am always careful about my manner of dress.

47. My table manners at home are as good as when I eat out in a restaurant.

48. If I could get into a movie without paying and be sure I was not seen, I would probably do it.

49. On a few occasions, I have given up doing something because I thought too little of my ability.

50. I like to gossip at times.

51. There have been times when I felt like rebelling against people in authority even though I knew they were right.

52. No matter who I am talking to, I'm always a good listener.

53. I can remember "playing sick" to get out of something.

54. There have been occasions when I took advantage of someone.

55. I am always willing to admit it when I make a mistake.

56. I always try to practice what I preach.

57. I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.

PUT ANSWERS ON THE ANSWER SHEET

PUT ANSWERS ON THE ANSWER SHEET

SECTION TEN (CONT'D)

1 True 2 False

58. I sometimes try to get even, rather than forgive and forget.

59. When I don't know something I don't at all mind admitting it.

60. I am always courteous, even to people who are disagreeable.

61. At times I have really insisted on having things my own way.

62. There have been occasions when I felt like smashing things.

63. I would never think of letting someone else be punished for my wrongdoings.

64. I never resent be asked to return a favor.

65. I have never been irked when people expressed ideas very different from my own.

66. I never make a long trip without checking the safety of my car.

67. There have been times when I was quite jealous of the good fortune of others.

68. I have almost never felt the urge to tell someone off.

69. I am sometimes irritated by people who ask favors of me.

70. I have never felt that I was punished without cause.

71. I sometimes think when people have a misfortune they only got what they deserved.

72. I have never deliberately said something that hurt someone's feelings.

This concludes the survey. We want to thank you for your time and your cooperation in completing it. If you have any questions about what will become of this information, please feel free to ask. Please now turn in this survey booklet and the two answer sheets to the survey administrator.

PUT ANSWERS ON THE ANSWER SHEET

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FOOTNOTES

Footnotes

[1]A constructive replication is a study which, if successful, extends the generalizability of the research after which it is modeled.

[2]The numbers in parentheses indicate the item number on the questionnaire. See Appendix B.

[3]This development of interaction is borrowed heavily from Netter and Wasserman (1974). For a more general discussion of interaction terms, see their text, Applied Linear Statistical Models, pp. 214-220, especially pp. 219-220.