INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeeb Road
Ann Arbor, Michigan 48106

Downloaded from SHAREOK. Persistent Handle URL: https://hdl.handle.net/11244/3875

75-6555

SHAFFER, Paul Lee, 1939-
PAY, PERFORMANCE AND EQUITY: AN EMPIRICAL STUDY AND EXTENSION OF ADAMS' THEORY OF INEQUITY.

The University of Oklahoma, Ph.D., 1974
Business Administration

Xerox University Microfilms, Ann Arbor, Michigan 48106

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED.

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

PAY, PERFORMANCE AND EQUITY: AN EMPIRICAL STUDY AND EXTENSION OF ADAMS' THEORY OF INEQUITY

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

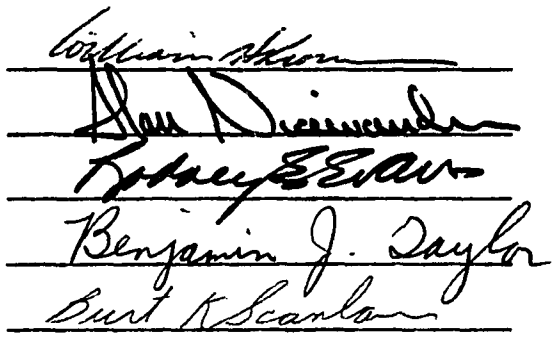
Paul Lee Shaffer

Norman, Oklahoma

1974

PAY, PERFORMANCE AND EQUITY: AN EMPIRICAL STUDY
AND EXTENSION OF ADAMS' THEORY OF INEQUITY

APPROVED BY



DISSERTATION COMMITTEE

ACKNOWLEDGMENTS

It is my understanding that this part of the manuscript is to be used to express my appreciation to those who have helped and sacrificed to see that a personal ambition of mine was realized. So be it, with the reminder that these words, as I express them, are wholly inadequate for this task.

William H. Keown, my teacher, firmly and gently guided me in this study, and in other matters far beyond the scope of this present effort. His example has shown me what is involved should I too become a teacher, scholar and gentleman. My payment to Dr. Keown can only be paid to others and therefore must reside in the future.

To Drs. Scanlan, Nicewander, Evans and Taylor I owe a debt for their knowledgeable technical assistance in the preparation of this study. All contributed in their own way when help was sorely needed. There are others on the faculty too numerous to mention who have provided counsel and guidance. To these unnamed and possibly unknowing participants I extend my appreciation.

A special thanks is extended to those practicing managers and employees at STAR. In particular my thanks is extended to Pete Moerlins whose political wisdom and professionalism aided greatly in the successful completion of this study. And to Bob Hall also a special thanks for his endorsement and active sponsorship of this experiment.

Of obvious but often understated value is the effort extended by the typist, Ruth Ann Schade, and programmer, Jim Lawson who were always there to help when needed. Constantly exposed to my situational and pragmatic admonishments demanding more and more speed, they nonetheless continued to produce at a high level.

To Paul D. and Ruth N. Shaffer, my parents, who are responsible for all that is good in me, a very special thanks for their never ceasing confidence and encouragement.

A very special kind of gratitude to my wife, Charlotte, whose patience, sacrifice and honesty have made this often times seemingly futile effort assume a greater value. Without her the effort never would have been attempted let alone completed. And to Aaron Timothy who was my constant reminder that enthusiasm with the small insignificant things of daily living are the most important and must be cherished as he is by me.

When I reflect on an activity such as this study, it is humbling and remarkable to note how much is owed to so many.

TABLE OF CONTENTS

Page

LIST OF TABLES v

LIST OF ILLUSTRATIONS vii

Chapter

I. INTRODUCTION 1

II. REVIEW OF RELEVANT LITERATURE 21

III. EXPERIMENTAL METHODOLOGY 87

IV. RESEARCH RESULTS 112

V. CONCLUSIONS 142

APPENDICES

A. QUESTIONNAIRES USED IN THIS STUDY 158

B. JOB DESCRIPTIONS AND STAR MANUFACTURING TABLE OR ORGANIZATION 166

C. FLOORPLANS FOR THE DRAFTING AND KEYPUNCH WORK AREAS 180

D. TRANSCRIPT OF THE EMPLOYEE BRIEFING 183

E. EXTRA PAY MEMORANDUM DISTRIBUTED TO THE E_1 AND E_2 GROUPS 194

F. DRAFTSMEN PERFORMANCE REPORT FORM 195

SELECTED BIBLIOGRAPHY 196

LIST OF TABLES

Table		Page
1.	Quantity of Group Performance in the Pretrial Period for Draftsmen	121
2.	Quality of Group Performance in the Pretrial Period for Draftsmen	122
3.	Total JDI Scores of Group Performances in the Pretrial Period for Draftsmen	122
4.	Quantity of Group Performance in the Trial 1 Period for Draftsmen	123
5.	Quality of Group Performance in the Trial 1 Period for Draftsmen	124
6.	Total JDI Scores of Group Performance in the Trial 1 Period for Draftsmen	124
7.	Quantity of Group Performance in the Trial 2 Period for Draftsmen	126
8.	Quality of Group Performance in the Trial 2 Period for Draftsmen	127
9.	Total JDI Scores of Group Performances in the Trial 2 Period for Draftsmen	127
10.	Quality of Group Performance in the Trial 3 Period for Draftsmen	129
11.	Quantity of Group Performance in the Trial 3 Period for Draftsmen	130
12.	Total JDI Scores of Group Performance in the Trial 3 Period for Draftsmen	130
13.	Quantity of Group Performance in the Trial 4 Period for Draftsmen	131
14.	Quality of Group Performance in the Trial 4 Period for Draftsmen	132

Table | Page

15. Summary of Quantity of Group Performance in the T-1, T-3 and T-4 Periods for Draftsmen 132

16. Summary of Quality of Group Performance in the T-1, T-3 and T-4 Periods for Draftsmen 133

17. Total JDI Scores of Group Performance in the Trial 4 Period for Draftsmen 134

18. Quality of Group Performance in the Trial 5 Period for Draftsmen 135

19. Quantity of Group Performance in the Trial 5 Period for Draftsmen 135

20. Total JDI Scores of Group Performance in the Trial 5 Period for Draftsmen 136

21. Quantity of Performance in the Posttrial Period for Draftsmen 137

22. Quality of Performance in the Posttrial Period for Draftsmen 137

23. Total JDI Scores of Group Performance in the Posttrial Period for Draftsmen 138

24. Correlation Coefficients of Financial Situation with JDI Pay Scales for All Groups and All Trials 140

LIST OF ILLUSTRATIONS

Figure		Page
1.	The Mediating Function of Equity Perceptions . . .	6
2.	Diagram of the Relevant Research Design Consideration for This Study	10
3.	References Cited by Adams (1965)	33
4.	A Trial Relationship	80
5.	The Basic Exchange Relationships	81
6.	A Model of Person's Cognitive Comparison	83
7.	An Equity Model.	85
8.	Occupational Classifications for Draftsmen	92
9.	Overview of Structure for the Research Design	96
10.	Quality Group Mean Scores for All Drafting Groups for All Trials	117
11.	Quantity Group Mean Scores for All Drafting Groups for All Trials	118
12.	Total JDI Group Mean Scores for Drafting Groups for All Trials	119

CHAPTER I

INTRODUCTION

Purpose

The purpose of this research is to identify and measure possible moderating effects of employee-perceived equity and inequity of pay on task performance. To demonstrate how this purpose was realized a brief synopsis of research procedures is presented to orient the reader.

The research was conducted in a firm located in Oklahoma City, Oklahoma, large enough to provide a minimum of fifty subjects who perform similar tasks for similar pay. Two experimental groups and one control group were involved in the research effort. Each group had sixteen participants. Performance measures for all three groups were taken two weeks prior and two weeks after the experimental intervention. Five trials (periods of experimental intervention) were involved in the study. Additional pay was given to one experimental group for three trials. Both experimental groups were informed of the extra pay being given to the one experimental group. The effect of this discrimination was expected to result in feelings of inequity which in turn was expected to result in differing performances among these same two experimental groups. The control group did not have knowledge of pay differences;

the control group's performance was compared in the standard manner with the performances of both experimental groups. The results were analyzed and interpreted by means of rather conventional statistical techniques: descriptive statistics, analysis and variance and correlational statistics. Before elaborating on these introductory remarks additional refinements of terms and their related definitions are offered.

Terms and Definitions

Pay

Pay is defined as monetary reward for performance. Intuitively the employee does what he does because he finds it rewarding.[1] Pay or money is a reward. With some exceptions, pay is universal in organizations. And in the nature of a more definitive statement Belcher (1962, p. 43-44) says, "If motivation is now recognized as being much more complex than we used to assume, pay still constitutes the most important single motivator used in our society." Generally when job behavior is followed by a reward that behavior is reinforced and therefore is likely to occur again assuming some constancy in the environment. On the basis of experience, employees come to anticipate or expect a reward. What is rewarding, the extent to which pay is rewarding, and when pay is rewarding is defined by the recipient, and therein lies an ultimate constraint on management practices. Organizations

---

[1]Study of this employee perception has been the object of much research effort, but the results are not altogether consistent.

are made up of people with their own unique perceptions of what is and what ought be. People, like researchers, all too often operate in a perceptive environment. These perceptions are not formulated in a vacuum but instead are arrived at through various means, one of which is comparison with those rewards given to others.

Tracing "pay" over an extended period one finds it at the focus of value theory, wage theory, exchange theory, and bargaining theory. Pay in contemporary terms is considered in industrial relations, personnel management, wage and salary, compensation administration and motivation theory. Economists from the classical period such as Smith and Ricardo, and later economists such as Marx, Jevons, Marshall, and Clark, and then later institutional economists and others into the present have demonstrated a keen interest in pay and its role in the greater scheme of things. Closer to management, pay is viewed as an integrating feature of compensation theory and is the central focus in "Wage and Salary." Wage and salary administration, or to use a more contemporary term Compensation Administration, formalizes the exchange process between employer and employee and the exchange process's principal vehicle is pay. The use of pay as a formal reward may in effect clearly demonstrate how management views its relationship with the employee regardless of what attitudes of leadership are expressed, the organizational climate advocated, and other means exercised by management to stimulate workers to do their jobs. In case it hasn't been made

evident, and it probably hasn't, pay in the context of this proposal is money and not other forms of compensation such as fringe benefits.

Performance

Performance is overt job behavior as it relates to the accomplishment of the assigned work task. With this definition performance may be reduced to an overly simple function. Literature abounds with the problems and techniques of job evaluation, and at the center of much concern is what constitutes performance.

Performance is defined as the degree of quantity and quality of output as it relates to an assigned task, or tasks, for an employee within a predetermined time period. Quantity relative to performance is the amount of output of a given employee within a given time frame. Quality refers to the degree of excellence for a given performance. Stated another way, quality is a lack of error in performing the assigned work role. Task or tasks is what a particular employee is required to do in his assigned work role. Performance, like pay, is also frequently defined by the recipient relative to what constitutes a reasonable performance, i.e., a fair day's work for a fair day's wage. To confound the situation, pay and performance are interwoven to such an extent that it is often difficult to isolate a valid independent and dependent relationship. A common problem in the determination of a certain wage for a given task is to assess the strength of the

connection, in the mind of the employee, between pay (reward) and performance. For quantitative purposes pay seems to represent a better starting point in the investigation of the association of the two. The rationale for this is based on the fact that pay is represented in numerical terms and this characteristic allows a safer assignment of pay as the independent variable. In part this may beg the issue because as stated earlier pay itself may mean different things to different employees.

Employees

Employees are defined as those individuals who make up an identifiable work group whose members perform like tasks that are assigned by management. For the purpose of this experiment group memberships and work assignments were not altered in any way. Intervention by the experimenter was limited to administering attitude questions and changing the pay of one work group.

Equity Theory

Equity theory is based on the premises of exchange theory and for many is almost one and the same. Equity theory postulates a social psychological relationship wherein a person compares his perceived gains and costs with the gains and costs of others. While the comparison of one to another is certainly a sociological phenomenon the frame of reference of the comparator is always psychological. In reality this is a complex situation where a person's cognitive activities are

interacting directly with his social activities. In this study, as in statements of equity theory itself, gains are defined as pay and performance is cost. Obviously, these definitions are cast in the employee's viewpoint. In Adams' formulation of equity theory pay becomes outcome and performance is input for the employee.

The use of the word equity clearly connotes and denotes the idea of fairness just as inequity communicates the idea of unfairness. It is the perceived fairness or unfairness that is thought to moderate an individual's job performance. Perceived inequity is presumed to exist when the situation is imbalanced. To test equity theory this experiment will intervene in this relationship by altering pay which should, in turn, cause some employees to alter performance.

What remains to be discussed in this introductory overview is the framework selected for this research. Equity theory was selected for the mediating or intervening role between pay and performance. This relationship is demonstrated in the following diagram (Figure 1).

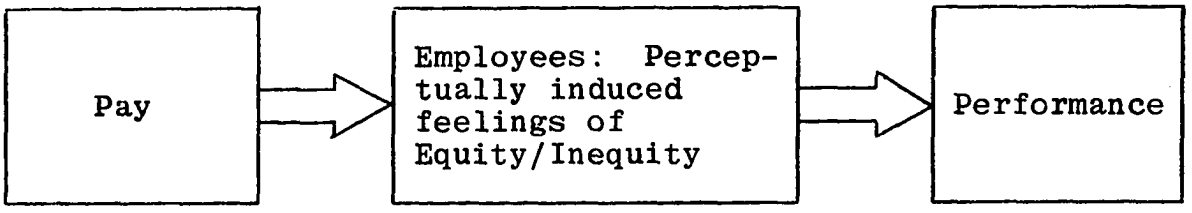


Figure 1. The Mediating Function of Equity Perceptions

The idea behind equity theory is far from being new; and although equity theory is one of several motivational

theories, nevertheless the literature is mostly of recent origin. The most comprehensive treatment of equity theory has resulted from the efforts of Adams (1962, 1963a, 1964, 1965) and others. Adams (1965) cites theorists such as Homans (1961), Jaques (1956, 1961, 1964b), Patchen (1961), Zaleznik, Christensen and Roethlisberger (1958) and others who have sought to apply to the work environment the concepts embodied in equity theory. Adams' formulation of inequity is closely followed in this research. Adams (1965, p. 280) defined inequity as:

> Inequity exists for Person whenever he perceives that the ratio of his outcomes to inputs and the ratio of Other's outcomes to Other's input are unequal. This may happen either (a) when he and Others are in a direct exchange relationship or (b) when both are in an exchange relationship with a third party and Person compares himself to Other. The values of outcomes and inputs are, of course, as perceived by Person.

As a point of clarification concerning terms equity appears to be generic in nature while inequity represents the absence of equity. Inequity is the focus in most of the literature reviewed. The reason for this is that it appears to elicit the greatest interest. Schematically equity and inequity may be represented in this manner (using Adams' notation and subscripts).

$$\text{Equity:} \quad \frac{Op}{Ip} = \frac{Oa}{Ia}$$

where O - Output
I - Input
p - person
a - other

Inequity: $\frac{Op}{Ip} < \frac{Oa}{Ia}$ (or) $\frac{Op}{Ip} > \frac{Oa}{Ia}$

(Disadvantageous for Person) (Advantageous for Person)

This proposed research effort has attempted not to emphasize inequity to the exclusion of equity. Both are integrated into the research design with equity presumed to be existent in the control group and inequity existing in the two experimental groups. As mentioned earlier the essence of the discrimination in the research is based on the differences in performance among the control and the two experimental groups. Inequity is created for the experimental groups by manipulating pay and the resulting changes in performance are hypothesized to be the effect of employee perceived inequities.

In summary equity theory is based on the comparison of Person to Other on the basis of Person's perceived ratios of their respective inputs and outcomes. For the purpose of this research we are directing our attention to equity and inequity as created by the intervention of the researcher as the third party.

It is explicitly assumed that the discriminate use of pay by management may imbalance the input-outcome ratio resulting in an employee-perceived injustice and thereby modify the relationship between pay and performance, or more positively stated, improper allocation of pay among employees doing the same work may result in an alteration by some employees altering their behavior so as to restore the

input-outcome ratio. This realignment may take several forms as will be discussed later, but this research is specifically directed at the alteration of performance by the employee as the result of a change in pay.

Research Design: A Summary

Research models may be modeled in many different configurations such as an iconic model, the analog model, and symbolic model. In its simple form a model structures the relationships among the component parts of some system and is based on the idea of isomorphicism. This overview of the research design is presented on the basis of an analog model which seeks to illustrate the relationships between: (a) the problems, (b) the hypotheses, (c) the universe, (d) the sample, (e) data collection procedures, (f) statistical description and inference, and (g) the results of the research. The research design in model configuration is presented in the following research diagram (Figure 2). The remainder of this subsection will concentrate on expanding each of the elements in the model as they relate to this specific research.

This introductory section is stated in very general terms. The three research problems are broad general statements concerning the fundamental questions of equity theory as it relates to compensation administration and each, therefore, has its own unique quality. Following the statement of each research problem are brief comments about the problem's

Research Design Overview

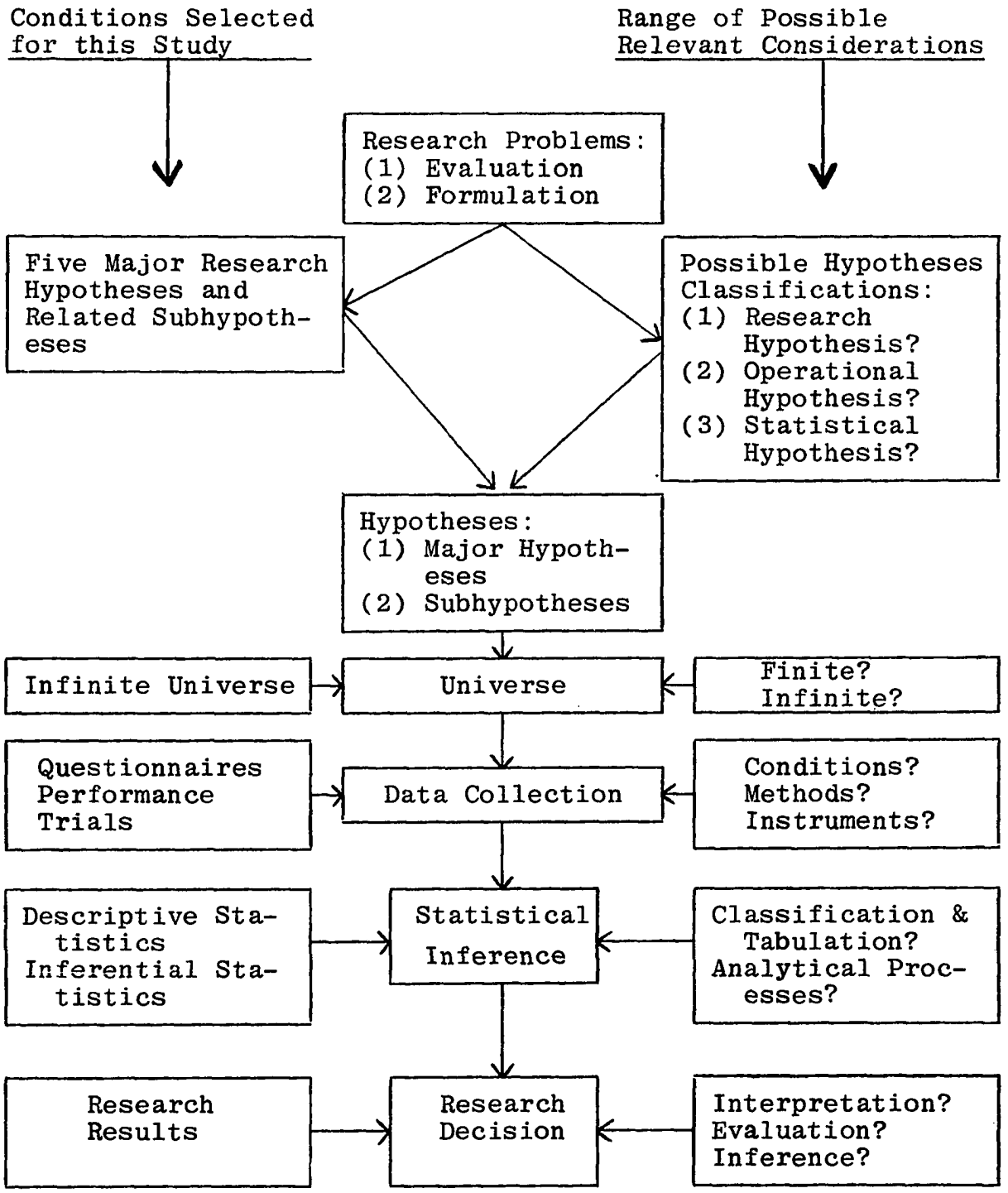


Figure 2. Diagram of the relevant research design considerations for this study. A detailed description and related discussion are in Chapters III and IV.

purpose, the general research method to be employed for testing, and the related testing measures. All of these matters are discussed again in Chapter III in greater detail.

Research Problems

Problem 1: A change in hourly pay moderates employee performance.

Purpose: To (1) test equity theory's prediction that employees seek to restore balance to an inequitable situation, and (2) test the relationship between pay and performance variables. The purpose, therefore, is to examine whether pay and performance are relevant in consideration of the exchange process for the employee.

Method: By altering pay for one experimental group a difference in the performance of that group should be observable. During trial periods the pay will be 110 percent, 130 percent and 115 percent of the normal pay.

Measure: A known amount of pay should moderate employee performance. Performance was measured in terms of both quality and quantity.

Problem 2: Employee perceived inequity in hourly pay is associated with moderated employee attitudes.

Purpose: The objective of this problem is limited to assessing inequities' potential for

moderating employee attitudes. It is speculated that employee perceived inequities may "spill over" and be reflected in feelings about the job. It is, however, beyond the scope of the present research to precisely measure this conjecture.

Method: The survey was conducted at the end of each of the five trial periods.

Measure: A change in pay may produce different attitudes in the respective groups on the basis of perceived equity.

Problem 3: An increase in hourly pay for one employee group, when not accompanied by a change in hourly pay for another employee group doing the same job, will be perceived by the group with unaltered pay as a decrease in pay.

Purpose: The purpose of the research problem is to examine the moderating effects of an increase in Other's outcomes on Person. This represents an effort to test the relationship of Person and comparator Other.

Method: Increase the pay for one group but not the other, measure the performance for both groups, and compare for possible differences.

Measure: Quality and quantity performance were measured along with possible attitude changes.

Inequity, as discussed earlier, involves a perception by the employee of the fairness or justice of his rewards relative to the rewards of others he has chosen for comparison purposes.

Problem evaluation was conducted through a review of related research dealing with equity theory, and has in part, resulted in the formulation of the problem statements.

Hypotheses

Five specific hypotheses and their respective minor hypotheses are presented in Chapter III of this study.

Universe

In an abstract sense the universe may be considered separately from the sample as the design diagram suggests. Population limits are determined by the problematic situation, the hypotheses, and naturally by the available resources. Homogeneity of the population is identified on the basis of:

1. Factors of time, place, conditions and other things implied by the above population limit statement.
2. Employees who are white collar, work for the same firm, in similar geographical and environmental surroundings, and who perform like tasks for earning a living.

Aside from the preceding, the population is unknown in statistical terms. The determination of this information is one of the chief functions of statistics. The population (universe) is infinite and therefore sampling is necessary.

Data Collection

Procedures for data collection gravitated around the work tasks and number of trials employed in the study. Work tasks are the normal work responsibilities of these employees. There were five trials for this experimental period. The dates and hours of the trial periods were the same for all groups. The second, third, and fourth trials were different for the two experimental groups in that extra pay was awarded to the members of one experimental group. The data collection and other procedures were identical for all trials and for all groups.

Instruments for data collection are designed to assess performance and attitude. An attitudinal survey was administered to all groups after every trial period. Performance measures were also collected for each group for a four hour period before and after the experimental intervention.

Statistical Verification

The statistics used for this study are divided into two groupings. Descriptive statistics such as averages, percentages and frequency counts are presented for the obvious explanatory characteristics. Inferential statistics used for this study are analyses of variances and several correlational statistical techniques, and were used, assuming the sampling was reliable, to make inferences about the population.

Research Decision

Evaluation and results of the study as will be discussed later are dependent on the meaningfulness of the descriptive statistic and the power of the statistical inference.

Theoretical Assumptions

For convenience the assumptions of the study are listed below in a numerical sequence that implies no ranking. Adams' (1963a, 1965) terminology will be used whenever applicable.

1. Person selects a fellow employee within the same organization performing similar tasks as the comparator Other.
2. Person makes a cognitive comparison between Inputs and Outcomes.
3. Person views performance and pay as Inputs and Outcomes, respectively.
4. Assumptions that pay as a variable is not overly contaminated by other potentially confounding variables.
5. Experimental conditions are assumed not to be significantly different from "normal" working conditions.
6. Subjects are randomly selected from infinite population and therefore results can be generalized for inferential purposes.

7. Adams' (1963a, 1965) classifications of Person's Inputs and Outcomes are correct and are not bound to a specific situation.
8. Person can cognitively manipulate Input and Outcome ratios to cause feelings of equity and inequity.

Admittedly this assumption listing is lengthy and therefore could be construed to be an example of the possible tenuousness of equity theory. An alternative view, which this researcher holds, is that the real meaning of these assumptions is that equity theory requires additional work and refinement even beyond the modest efforts of this study.

Limitations of Study

Aside from the rather specific assumptions listed above there are two fundamental categories of limitations of any research effort. These limitations are (1) the conceptual format, and (2) the analytical methods used for evaluation and inference.

1. Conceptual Format: The framework established by those who conceptualize the problem and its scope may, and probably does, delimit their alternatives. While this is necessary for control it often results in the creation of guidelines that limit alternative problem definitions.
2. Analytical Methodology: Methodology is the composite of scientific methods chosen to test something. The structure of the methodology is laid

> out in the research design and the techniques selected for statistical verification and inference. Inherent in all this is another grouping of assumptions, the principal one of which is that phenomena can somehow be categorized in quantitative (numerical) terms. Assuming the right statistical technique itself is based on an all-too-often fragile set of assumptions.

These general assumptions, together with the "Theoretical Assumptions" listed in the preceding section, remind this researcher and his readers alike of the fragility of this research.

Need for Research

To legitimize a need is to somehow attach a value to it. The purpose of this section is to identify why the proposed research was conducted.

The fundamental and admittedly oversimplified exchange process has two participants: the employee who provides skill and effort, herein called performance, and the employer who provides pay. Compensation administration is the organizational means for seeing that the contributions of the two participants are brought together in a mutually acceptable degree of equality. Compensation administration brings all the activities between the employer (as representative of the organization) and employee (an individual) together to focus on the formalized exchange process of paying and performance.

The relationship between the two, pay and performance, presently appears to be only as precise as the phrase "a fair day's pay for a fair day's work." However, the literature concerning pay and its multitude of relationships is very rich; unfortunately it lacks substance for the practitioner and teacher. Pay, performance and their respective relationships do offer a fertile soil for the researcher. The questions relating to such research can be reduced to three elementary questions:

1. What is pay?
2. What is performance?
3. What is the relationship, if any, between pay and performance?

Compensation administration seeks to bring performance and pay into congruence. If that administrative process is effective then a balance is achieved where the "fair" amount of pay is delivered for a "fair" amount of performance. Balance in this circumstance is where expected performance occurs and in turn is followed by the expected pay. Said another way, balance is where equity exists. Equity is a value laden term and carries with it cognitive characteristics --equity exists in the eyes of the beholder. Equity is both a social and individual phenomenon. Imbalance may exist in a compensation system, and when it does it is viewed as inequity. Inequity has the same individual perceptual characteristics as equity.

As mentioned earlier pay and performance are relative to one another and possibly to other organizational variables. Pay is without a doubt important, as is performance, but taken separately their respective meanings and uses are of limited scope. What is needed is a means for relating pay and performance. Equity theory provides such a framework and seems to go beyond a simple first order of magnitude.

This research provides a further test of Adams' (1963a, 1965) theory of equity, as applied to the special case of an induced wage inequity. For the purposes of this research wage inequity exists when "inputs" are not in what is perceived as an "equitable" balance with outcome (pay). In motivation terms this perceived imbalance results in a drive to restore balance. Balance is restored by the employee through the manipulation of performance or outcome. In an hourly wage situation employees normally perceive the amount of pay as a given: therefore, his options take on a singular direction. Performance can be altered, either increased to compensate for perceived overpay, or decreased for perceived underpay.[1]

Summary

The preceding discussion has been an attempt to introduce the concepts and their related assumptions in a research context. Pay, performance, and attitudes represent the

---

[1]Other options, less overt, would be to emotionally distort facts. Such a distortion is a relevant consideration but is beyond the scope of the present research.

essential variables in this study.[1] The research effort has involved an examination of this relationship and a determination of the extent of this relationship all within the framework of Adams' equity theory.

A general research model was presented and discussed to show how all the involved variables would be examined.

The next chapter is representative of the literature concerned with equity theory in the context of pay and performance. This review shows the development of equity theory and provides the reader with the research context for this study.

---

[1]Pay was defined as money presented as a reward to the employee for a given performance. Performance was defined as task accomplishment as measured in terms of quality and quantity. Attitudes are the feelings employees have as the result of perceptions about equity. Equity describes the employee's perception of fairness and rests on the comparison by Person of his outcomes over inputs to Others' ratio of outcomes over inputs all as perceived by Person.

CHAPTER II

REVIEW OF RELEVANT LITERATURE

Chapter II is a review of relevant equity theory literature and is divided into three major sections. The first section presents a comprehensive review of J. Stacy Adams' empirical contributions to equity theory. This first section is therefore organized on a chronological basis and includes a summary of each of his five experimental reports, beginning with his first experiment in 1962 and concluding with his last contribution in 1965. Later in this chapter, and in other places where appropriate, all of Adams' experiments will be discussed in more detail. The second section of Chapter II consists of summaries of contributions to equity theory made by researchers other than Adams. By necessity this section includes analyses of Adams' contributions as viewed by others, and in some cases presents disagreements and criticisms not only with Adams' research results but also with equity as a theory. The purpose of the third section is to "bring together" or merge those materials presented in the first two sections into a comprehensive structural equity model; by nature this last section is theoretical.

Equity theory is one of the principal formulations relevant to financial compensation. Equity theories have been

presented by Jaques (1961), Patchen (1961), Homans (1961), and Adams (1963a, 1965). This study focuses on Adams' statement of equity theory. Prior to expanding on others' formulations and considerations of equity theory it will be useful to review the approach of Adams and his associates to inequity theory.[1] A major portion of this section emphasizes Adams' development of equity theory.

Equity is, according to Adams (1963a, p. 422) a pervasive concern of all organizations. Equity is presented as being more elegant than a simple economic definition would allow, and has in its make-up considerations that focus on the psychology of the individual and on his social environment. In some respects equity has the undesirable characteristics for research efforts because it appears to be a concept that encompasses the world and all its interrelationships. Because of equity theory's comprehensiveness, Adams and others have tended to define it as inequity which is presumed to have a greater specificity for research purposes.

Adams (1963a, p. 422) gives Stouffer, Suchman, DeVinney, Star, and Williams (1949); Zaleznik, Christensen, and Roethlisberger (1958); Jaques (1956, 1961, 1964); Homans (1961); and Patchen (1961) credit for seeing that equity theory encompasses more than economic considerations. In all fairness it should be noted that in each study, where equity

---

[1]Adams (1963) uses "inequity theory" to denote his treatment of equity theory, although his usage is inconsistent. "Equity" is still thought of as the generic term.

theory was tested, economic considerations were a focus of interest. The obvious explanation is that money, more specifically pay, represents a quantitative means for examining equity theory. In brief, pay provides a handy point of reference for evaluating the relevance of the equity concept. Testifying to this is the fact that most American researchers have accepted pay as a means for testing equity theory, of which Adams is a leading proponent.

Adams (1963a, p. 422) states that inequity theory has been developed from Festinger's (1957) theory of cognitive dissonance. It is believed that while Adams may have been stimulated by the conceptual considerations and framework offered by the cognitive dissonance that equity theory is by no means a spin-off.[1] The idea is hardly new nor is its configuration. What is innovative is the research efforts and the emergence of new thinking about equity theory's relevance to contemporary job behavior.

Section 1: Review of Adams' Contributions

The following discussions in this section are concerned exclusively with Adams' formulation and testing of equity theory. Comparisons to other studies discussed later will be mentioned from time to time to assist in making the

---

[1]As noted above, other researchers formulated the equity concept relative to pay and performance plus other considerations prior to 1957. Examples of this are Jaques (1956), Homans (1961), and others already mentioned in the above paragraph. The point of this comment is not to establish who was first but rather to add support of the historical pervasiveness of the equity concept.

explanations more relevant. The format will follow a chronological sequence beginning with the 1962 experiment of Adams and Rosenbaum.[1] For the reader's convenience each experiment will be subtitled with the researcher's name and dated.

Adams and Rosenbaum (1962)

These experiments covered a period from the winter of 1960 to late spring of 1961; the experiments were titled "Experiment I" and "Experiment II" and each had its respective hypothesis. To avoid possible confusion this discussion will follow Adams and Rosenbaum's format as reported in the referenced article.

Experiment I: The independent variable was pay and the dependent variable was productivity. The hypothesis of Experiment I was "When a Person is paid by the hour his productivity will be greater when he perceives his pay as inequitably large than when identical pay is perceived as equitable" (Adams and Rosenbaum, 1962, p. 161). Twenty-two male students were hired to do interviewing work on a part-time basis at $3.50 per hour. Eleven of the students were told they were unqualified and the remaining eleven were told they were qualified. By informing the eleven they were unqualified Adams and Rosenbaum created a feeling of inequity or dissonance. The hypothesis was supported. The unqualified group produced significantly

[1]It should be mentioned that Adams appears to have initiated his experimental efforts to study equity theory with a 1961 experiment, however the results were not published and only mentioned in passing by Adams and others. Therefore, this discussion must begin with the 1962 experiment.

more than the qualified group. Using nonparametric tests a statistical significance (X^2 - 4.55, df - 1) was realized.

It should be noted that Adams and Rosenbaum, by telling eleven of the subjects they were unqualified, may have created problems of internal validity and in essence involved self-esteem considerations. This point, and others, have received considerable criticism from other researchers and will be elaborated on later in this discussion.

Experiment II: Experiment II was designed to test or validate the results of Experiment I and to add another dimension by extending the predictions of equity theory to piece-rate work. Accordingly the hypothesis for Experiment II "was that whereas Ss overpaid by the hour would show greater productivity than controls, Ss overpaid on a piece rate would show less productivity than controls." (Adams and Rosenbaum, 1962, p. 163) The reasoning behind this hypothesis appeared to be that subjects overpaid by the hour would reduce inequity by increasing productivity. For Experiment II there were thirty-six subjects divided into two groups of eighteen subjects for hourly and piece rate; both of these two groups were further sub-divided into two groups of nine each and designated as control and experimental groups. The task, as before, was interviewing. The hypothesis was substantiated through non-parametric tests. An unexpected finding was realized in that there was a lower productivity for all piece-rate workers, both control and experimental groups, as compared to all hourly workers. Adams and Rosenbaum (1962, p. 164) label

this as a possible "artificial" finding and spend considerable effort in their discussion section exploring possible reasons for its existence.

Relative to theory, this 1962 article states very clearly the relationship of cognitive dissonance to equity theory. In point of fact, Adams and Rosenbaum say that the hypotheses are generated on the basis of cognitive dissonance theory and then proceed to test their predictions using the presumed greater specificity of equity theory. Their references do not acknowledge Homans or others then working in this area other than Arrowood (1961). In most respects Adams and Rosenbaum's 1962 efforts were oriented towards examining cognitive dissonance rather than equity theory.

In summary Adams and Rosenbaum's 1962 study was conducted to test these predictions:

1. Overpayment on an hourly basis would result in increased productivity; and
2. Overpayment on a piece-rate basis would result in less productivity.

Two experiments were conducted using college students for conducting interviews. Both experiments supported the predictions as based on the structure of equity theory in that subject inputs would be manipulated to restore balance or equity. Conditions of inequity were artificially created by the researchers at the onset of the study. Criticisms leveled against this study have largely focused on the poor judgment by Adams and Rosenbaum in constructing their

methodology.[1] It should be added that methodological or design problems have plagued all equity research. This is discussed in other sections of this study.

Adams (1963a)

Adams' first study in 1963 contains two identifiable but interrelated objectives: to present a more comprehensive theoretical model of equity and inequity, and to reexamine and extend three previous experiments (Arrowood, 1961; Adams and Rosenbaum, 1962--hourly study; Adams and Rosenbaum, 1962--piece-rate study). Adams (1963a) denominates these studies as Experiments I, II, and III and his extensions of these studies as Experiment IV. Adams' analysis of the three previous studies is interesting as the reader is given a fair idea of how Adams shaped his thinking prior to Experiment IV. Results from Experiments I-IV generated what Adams called a general theory of inequity (1963a, p. 435).

A problem of the three previous studies was that they failed to discriminate between different configurations of worker inputs. Production was measured exclusively on a quantitative basis (i.e., how much was produced for a given outcome) and therefore no consideration was given to qualitative inputs. Adams (1963a) modified the Adams and Rosenbaum (1962) experiment by adding three open-ended questions. Each

---

[1]It should be noted that Adams and Rosenbaum's 1962 efforts did incorporate measures to overcome certain inadequacies of Arrowood's 1961 study. Judging by the commentary surrounding Adams and Rosenbaum's 1962 efforts they were not entirely successful.

question then became a quality measure and was based on the number of words written down by the interviewers (who were the subjects in the experiment). The more words, according to Adams, the higher the quality. Results from Experiment IV supported the predictions based on equity theory: overpaid interviewers produced more words than equitably paid interviewers. The results of the Experiment IV were impressive as Adams reports a t - 1.82, p - .05, one-tailed test for the equitably paid subject and a t - 2.48, p - .02, two-tailed test.

In several respects Adams' 1963a article represents a hodge-podge of theoretical considerations. On pages 422 and 423 cognitive dissonance, marginal utility of wages, exchange theory and equity are mentioned; and usually in isolated context and setting. Equity theory is renamed inequity theory and assigned the status as "a pervasive concern of industry, labor and government" (1963a, p. 422). Adams' clearly stated purpose for the 1963a article is to present a theory of inequity that will hopefully provide an understanding and control of the phenomenon. This ambitious project was partially successful. The experiments substantiated Adams' earlier efforts but his interpretation of this meaningfulness fell short of the mark of adding to the substance of equity theory. The more positive results of Adams' 1963a reexamination of equity theory led to a broadening of content. Equity theory was tested as a theory in its own right rather than as a means to evaluate predictions made on the basis of cognitive

dissonance. Furthermore, equity theory seemed to become allied more closely with exchange theory than before. This was fortunate because, like cognitive dissonance theory, equity theory seems to come close to complying with the prerequisites of a motivation theory which requires that direction, amplitude and persistance be clearly identifiable for completeness.

In summary, Adams' (1963a) effort was to extend and clarify previous equity studies. Experiment IV of the series was focused on resolving the quality issue which had been raised by critics. Improvement of quality of his performance, while simultaneously restricting the quantity, was another means a subject could reduce dissonance, or restore equilibrium.

Adams (1963b)

Adams' second 1963 study (1963b, pp. 9-16) is a summary of previous research efforts and was prepared especially for "A Symposium: Psychological Research on Pay." As such this report does little to add to the already previously obtained results although in some places Adams appears to have benefited from others' analyses of his work. Adams summarizes his previous efforts as an attempt "to extend the implications of the cognitive dissonance theory to a practical problem" (1963b, p. 15). However, once again Adams makes it very clear that he is attempting to tie pay to performance. It should be noted, however, that in four experiments reported in the

two 1963 studies pay was not changed (i.e., the independent variable was not manipulated) which seems to represent some incongruence if a statistical relationship between variables is to be demonstrated. Instead the cognitive structure of the Subject was manipulated, and was therefore the presumed independent variable which would affect productivity. This represents a source of problems in interpreting research results with the most obvious being the often-encountered questioning of Adams' internal validity mentioned earlier.

Adams and Jacobsen (1964)

The 1964 study by Adams and Jacobsen (1964, pp. 19-25) apparently was undertaken to evaluate which of the alternative explanations have to do with the internal validity problems already mentioned. Andrews (1967) and others have suggested that inequity was not caused by dissonance, as Adams and Adams and Rosenbaum had suggested, but instead was the function of an aroused job insecurity. Adams and Jacobsen (1964, p. 19) focus operationally on piece-rate outcomes to demonstrate work quality and quantity interaction in the reduction of inequity or dissonance. Explicitly stated by Adams and Jacobsen was the assumption that piece work is the best means to test the quality issue (1964, p. 19). A more powerful statistic, a 3x2 Factorial Design was used to test the hypothesis in the 1964 effort. The task was auditing pages of galley proof and was performed, as usual, by college students. A rather complex coding system, devised to assist in explaining the

study's results, will not be included in this discussion. Adams and Jacobsen's (1964, p. 22) study results supported their hypothesis in that dissonance resulted in the differences of quality performance among groups. Needless to say the statistical results clearly support these authors' explanation.

This study also resulted in an unpredicted finding (1964, p. 24). High-dissonance subjects overcompensated in that they found more errors than were really there. Adams and Jacobsen interpreted this finding as an index of the strong motivation in the high-dissonance group. Arrowood (1961) also noted much the same thing in that workers who perceived themselves to be overcompensated worked additional hours.

The practical implications of Adams and Jacobsen's (1964) findings, as well as those of Arrowood (1961), imply that overpayment by management need not necessarily increase labor costs provided management is primarily interested in product quality. This finding also implies the opposite for a management interested primarily in quantity performance.

Adams (1965)

"Inequity in Social Exchange" (1965, pp. 267-299) is Adams' most comprehensive treatment of equity theory. While the 1965 article contains no additional experimental work it is viewed as a sizable contribution to the development of equity theory.

A unique characteristic of Adams' 1965 work is that it signals a distinct change in Adams' conceptual base. In earlier works (1962, 1963a, 1963b, and 1964) Adams clearly bases his theoretical premises on Festinger's (1954, 1957) concept of cognitive dissonance. Adams' 1965 work instead utilizes Homans' (1950, 1953, 1961)[1] concept of distributive justice as the point of departure in developing a theory of equity. This is viewed as a significant position change for it allows equity theory to be based not only in a historical philosophical framework but also allows an expansion of theory parameters. Before expanding on the significance of this new position, evidence for the "switch" is offered. Figure 3 is a simple tally, pedestrian as it might be, of references mentioned in Adams' 1965 work. Unfortunately space does not allow a more extensive survey relative to the context of each reference and importance attached by Adams. However sheer numbers should provide such indication of the magnitude of Adams' shift from Festinger's cognitive dissonance to Homans' distributive justice framework.

A devastating critique of cognitive dissonance was produced in 1961 as Tavistock Document No. 626 "Cognitive Dissonance: A Dissenting Voice." In the January, 1964 issue of the Psychological Bulletin (Vol. LXI, No. 1) Chapanis and Chapanis utilizing data obtained for the Tavistock report

---

[1]There is a problem in the literature relative to Homans' 1953 study. Several researchers, including Adams (1965), erroneously cite the date of the study as 1963.

Homans	23	Zaleznik	4	Bramel	1
Thibant	13	Brehen	3	Conlon	1
Patchen	7	Clark	3	Crozier	1
Sayes	7	Cohen	3	Dickson	1
Steiner	7	Adams & Jacobsen	3	Gebbard	1
Adams	6	Leventhal	3	Johnson	1
Festinger	6	Skinner	3	Kelly	1
Stouffer	6	Herzberg	2	Livernash	1
Jaques	5	Hyman	2	Newcomb	1
Kitt	5	Peters	2	Pilisuk	1
Merton	5	Weick	2	Roethlisberger	1
Spector	5	Arrowood	1	Rogus	1
Adams & Rosenbaum	4	Blau	1	Vroom	1

Figure 3. References Cited by Adams (1965)

(senior author Natalia Chapanis participated in preparing Document No. 626) also came to negative conclusions in their evaluation of cognitive dissonance. Inasmuch as Adams' article appeared in 1965, it is not unlikely that these evaluations influenced his turnabout. Whether this is true is speculation. The principal criticisms of cognitive dissonance as outlined by Chapanis and Chapanis (1964, pp. 1-22) are summarized:

1. Criticism of the design and analysis was directed toward at least 12 of the major dissonance studies.
2. The abstraction level of cognitive dissonance is so far removed from reality as to make testing virtually impossible. This seems to be substantiated by the preceding item one.

3. Cognitive dissonance at first glance has an allure of simplicity whereas in actuality it is an extremely complex concept. The question of how to reduce a multitude of social factors to two simple statements is unresolved. This paradox of simplicity, according to Chapanis and Chapanis (1964, p. 20), is the downfall of the cognitive dissonance theory.

Summarizing, cognitive dissonance appears to be a paramount example of poor design, uncontrolled and confounded variables, questionable internal validity, and unproven as a theory. If these criticisms are valid, it is no small wonder that Adams may have been stimulated to reorient his theoretical base.

However the purpose of this study is not to examine the cognitive dissonance theory but rather to extend, through scientific inquiry, Adams' formulation of equity theory. As Adams' 1965 work represents his most sophisticated contribution to theory it is used as the theoretical base for this study. This author is in full agreement with the use of Homans' definition of social justice as the logical antecedent of equity theory.

From the beginning Adams examined possible causes and results of inequities rather than equities which in part had delimited the scope of variables under consideration. Furthermore Adams has attempted, in all research, to confine his efforts to pay and performance. Both pay and performance are overt behaviors that are observable and seem to be

representative of something akin to Skinnerian thinking. Relative to cognitive processes Adams' theory is no weaker or stronger than those motivation theories postulated by others. Little hard data exist that explain the cognitive processes of perception, decision-making, and motivation of the various schools of psychological thought. Some of the problems Adams experienced (1963a, 1965) in relating input and outcome variables are traceable to the fact that from the beginning Adams adopted a social-psychological approach.[1] This approach not only incorporates a greater range of relevant social and psychological variables (as compared to a wholly psychological approach) but also incorporates the problems of measuring the interactions of two sets of variables. To effectively combine such a broad range of variables requires some necessary simplification: Adams accomplishes this by reducing everything to a simple three-part model. Adams attempts to control the necessary abstraction by locking firmly on pay and performance. Pay is divided into hourly and piece work while performance is measured in terms of both quality and quantity. Adams' initial efforts (1962a) dealt only with a quantity measure of performance although both hourly and piece-work methods of pay were considered. Later studies (1963a, 1964) included quality measures of performance,

---

[1]These problems were identified by Weick (1967), Opsahl and Dunnette (1966) and others.

chiefly to better explain input alternatives open to Person.[1]

Three models may be used to explain the concept of equity. Actually, there are no real differences in the content of these models although their configurations are dissimilar. The first model is the one formulated by Patchen (1961), the second model is that of Homans (1961) and the third is Adams' model of inequity. These respective models will be presented beginning with Patchen's. Patchen's (1961) model was clearly developed on the basis of Festinger's (1957) cognitive dissonance framework. Patchen's model (1961, p. 9):

$$\frac{\text{My pay}}{\text{His (their) pay}} \quad \text{compared to} \quad \frac{\text{My position on dimensions related to pay}}{\text{His (their) position on dimensions related to pay}}$$

Homans' distributive justice (1950, 1953, 1961) model has an articulated character that includes a greater number of accouterments than Patchen's model. Schematically Homans' model:

$$\frac{\text{A's rewards less A's costs}}{\text{A's investments}} \qquad \frac{\text{B's rewards less B's costs}}{\text{B's investments}}$$

Adams' (1965, pp. 280-281) model is used to define inequality and is more symbolic than Patchen's or Homans' models; but it still carries essentially the same message.

---

[1]It should be noted that these four variables: hourly and piece-work pay, and quality and quantity measures of performance, are often readily available in the industrial setting which adds greatly to the practicality of scientific verification of theory.

The content and substance in Adams' model more closely resemble Homans', especially when their respective descriptions and context are compared. Adams' (1965, pp. 280-281) model has three representations which denote two different inequity situations and one equity situation:

$$\text{Equity} - \frac{Op}{Ip} = \frac{Oa}{Ia}$$

$$\text{Inequity} - \frac{Op}{Ip} < \frac{Oa}{Ia}$$

$$\text{Inequity} - \frac{Op}{Ip} > \frac{Oa}{Ia}$$

where: O - Outcomes
I - Inputs
p - Person
a - Other

Homans' and Adams' outcomes (O) and inputs (I) in ratio configurations are the sums of such outcomes and inputs as relevant to the exchange process. Note that the "I" and "O" as observable phenomena are amenable to dependent and independent assignments.

In most respects all the models (Patchen's, Homans' and Adams') are very similar[1] although Patchen's (1961, p. 14) model contains a consideration of the future which is stated as:

$$\frac{\text{My pay now}}{\text{His (their) pay now}} \quad \text{compared to} \quad \frac{\text{My future position on dimensions related to pay}}{\text{His (their) present position on dimensions related to pay}}$$

[1]Patchen's 1961 model is more focused than Homans' or Adams' in that the emphasis is on pay rather than rewards (Homans) or outcomes (Adams). Also the ratio configuration is different in that it is structured on the basis of "My pay" to "His (their) pay" as compared to Homans and Adams ratio of Outcomes (Rewards) to Inputs (Investments). In essence the difference is in the configuration of how the comparison between two employees might be made by a given employee. The end result of use of any of the three models would be the

Patchen's considerations represent (1) a consideration of the future, and (2) an orientation that is more directly related to dissonance and satisfaction as is evidenced by Patchen's (1961, p. 13) Hypotheses 1, 1a, and 2.[1]

Neither Homans nor Adams are oriented so closely as Patchen to explaining job satisfaction and dissonance. Both Adams and Homans are looking at a general case of equity; Adams is using the equity framework to identify the magnitude of relationships between pay and performance, and Homans to explain investment and rewards of the three models presently under discussion.

---

same. Both Homans' and Adams' models are more general than Patchen's. Patchen specifically denotes pay while Homans uses rewards, a more general term and Adams utilizes outcomes which is also a more general term. To illustrate the point Homans' rewards might be status, promotion or pay, investments might be training, seniority and costs might be responsibility or danger. Adams' model agrees with Homans' in that outcomes could be status, etc., and inputs could be seniority, etc. However Adams, because of the straightforward $\frac{O}{I}$ ratio is less clear than Homans' on explaining costs. Costs, as identified by Homans, would be Inputs for Adams.

[1]These hypotheses are stated by Patchen (1961, p. 13) as:

Hypothesis 1. Wage comparisons which are objectively dissonant will be judged as unsatisfactory by the person who chooses such comparisons.

Hypothesis 1a. Men who choose "upward" wage comparisons who are similar in status (same occupational level, same place of work, or same family) will more often be dissatisfied with such comparisons than will men who choose upward comparisons of different status.

Hypothesis 2. Men who are satisfied with specific wage comparisons will explain their satisfaction in terms of a consonance between relative wage standing and relative standing on attributes related to pay; men who are dissatisfied with specific comparisons will explain their dissatisfaction in terms of a dissonance between relative wage standing and standing on attributes relevant to pay.

Adams' efforts are outstanding because of his repeated attempts to make specific predictions based on equity theory. For example, Adams' definition of inequity ($\frac{Op}{Ip} < \frac{Oa}{Ia}$ or $\frac{Op}{Ip} > \frac{Oa}{Ia}$) would predict that when Person is relatively underpaid or overpaid that inputs or outcomes will vary proportionally with Person's perceived inequity. Three of Adams' studies (Adams and Rosenbaum, 1962; Adams, 1963; and Adams and Jacobsen, 1964) deal with testing some aspect of these predictions, either by measuring quantity, or quantity and quality, as in Adams and Rosenbaum's (1962) and Adams' (1963a), as it relates to pay. In his experimental efforts Adams confines his predictions to these variables (pay and performance) and does not attempt to incorporate a larger range of variables. Zaleznik, et al. (1958) and Patchen (1961) both attempt to incorporate a greater range of experimental variables.

Of considerable value to compensation practices and production control is that Adams has demonstrated Person will alter his inputs (Adams and Rosenbaum, 1962; Adams, 1963a; and Adams and Jacobsen, 1964) relative to outcome. Inputs for Person are outcomes for the business (performance). This idea is not original with Adams and is admittedly borrowed from Jaques (1961) and Homans (1951, 1953, 1961). Adams' research efforts have also demonstrated that Person does and will manipulate quantity versus quality or vice versa on the basis of a given outcome. As in so many instances, there are, unfortunately, two sides to this issue, and Adams' research views only one. All of Adams' efforts examine overpayment,

and none deals with underpayment. The only incident of underpayment, as reported by Adams, is a study involving the findings of Clark (1958). Clark's study, according to Adams, indicated that under conditions of inequity induced by perceived undercompensation, not only was the quantity performance of bundlers reduced but an overall reduction of store profits resulted. Unfortunately, research evidence as to the moderating effects of underpayment on performance is presently lacking in the literature dealing with equity theory. Adams' reason for excluding undercompensation (1965, p. 286) was that the results of overcompensation would provide a more "striking" comparison. Evidently, aside from previous rationale, Clark (1958) provided ample evidence of the effects of undercompensation performance. Adams' contention that undercompensation will also moderate input receives some support from Patchen (1961) as if a certain extrapolation is permissible. The opinions of Jaques and Patchen may be addressed. In his work on pay differentials, Jaques (1961b, p. 26)[1] notes that undercompensation results in general symptoms of dissatisfaction such as grievances or turnover or more direct measures such as production reduction. Couched in Adams' terms, perceived unfair pay results in reduced performance. Whether this reduction is a quantity or quality moderation is difficult to ascertain and, at the risk of seeming trite, is situational. The point remains, however, that Person's input will be

---

[1]This is according to Adams (1965).

moderated. Homans' framework could possibly postulate the same results. However, Homans' (1953) study of ledger clerks and cash posters did not tie pay to performance, but instead focused on felt inequity. Patchen (1961) predicted that undercompensation would result in greater dissatisfaction. There is, however, a very real problem in defining what constitutes satisfaction or dissatisfaction. Study results obtained by Patchen supported the prediction. Patchen's research like others, excluding Adams, did not consider measures relating performance and pay.

Jaques makes an interesting speculation in regard to undercompensation that has a certain intuitive appeal when he notes that underpayment elasticity is greater than overcompensation elasticity. Jaques further indicates that the threshold for undercompensation is actually quite low. In Adams' terms this would indicate there is greater sensitivity in the I and O ratio relationships where a perceived disadvantage existed. Jaques estimated that a 10 percent difference of undercompensation would result in dissatisfaction or, and again in Adams' terms, a possible 10 percent reduction in performance (Person's input). Jaques estimated that a 10 to 15 percent difference in an overcompensation pay differential would be required to induce feeling of dissatisfaction.

Adams (1965, p. 283) states that inputs may be changed by Person to restore balance. Outcomes such as pay, advancement, etc., are less amenable to change and, by nature, require a longer and more uncertain timeframe. Inputs, such as

performance, may be altered within a very short time-span and are largely controllable by Person. Adams (1965, pp. 283-296) identifies seven methods by which Person may react to perceived inequity:

1. Altering inputs,
2. Altering outcomes,
3. Cognitive distortion of inputs and outcomes,
4. Leaving the field,
5. Person acting on Other,
6. Person redefines comparator Other, and
7. Choice among Modes of Inequity Reduction.

Adams' studies have been limited to date to situations involving alteration of inputs by Person and more specifically to conditions in which Person was inequitably overpaid. Symbolically, this is:

$$\frac{Op}{Ip} > \frac{Oa}{Ia}$$

Therefore part of the first item in the listing above and all remaining items are suppositions. For the present, discussions will also be subject to this constraint.

Person Altering His Inputs

Person will alter his inputs according to his perceived relative comparisons with Other. Inputs (which are described here as job performance) will be decreased if Person's outcomes are disadvantageous or increased if outcomes are advantageous relative to Other. Person's inputs may be decreased or increased on the basis of quantity or

quality of performamce. Experiments by Adams and Rosenbaum (1962), Adams (1963a) and Adams and Jacobsen (1964) were specifically designed to test input moderation. Adams (1965, p. 284) states that all these studies support this contention. A similar finding was also reported by Arrowood (1961). As noted earlier all these referenced experiments dealt with overcompensation.

It is suggested that to fully test the predictions of input manipulation as based on equity theory that experimentation should also be conducted involving undercompensation. This present study has integrated within the research design a possible means for testing predictions concerning both overcompensation and undercompensation.[1]

Person Altering His Outcomes

Person may alter outcomes somewhat like inputs, although with less effectiveness, by decreasing or increasing them depending on whether Person perceives the inequity as being advantageous or disadvantageous. Outcomes include pay, promotion, status, or whatever Person views as having value for meeting his needs. Outcomes like inputs are also evaluated by Person comparing his outcomes to the outcomes of comparator Other. In contrast to inputs, however, outcomes are not under the direct control of Person; instead they are provided by a source external to Person. In the usual

---

[1]For a more detailed discussion of the research design, please refer to Chapter III.

situation an employee's performance (i.e., his input) precedes even his pay (which is one form of outcome for him); and the determination of most outcomes is vested in management or its representative. What all this means is that Person as an individual[1] can be assumed to realize this is a characteristic of his environment: he exercises little direct control over the outcomes and, consequently, Person adjusts to a perceived inequity by altering his inputs to the exchange. Therefore, this discussion offers little about how Person directly alters outcomes. This is also an accurate reflection of the literature on this matter. To fully categorize outcomes is beyond the scope of this effort. To adequately explore this interesting phenomenon would involve a heroic set of assumptions and the acceptance of at least one of the many psychological theories that attempt to explain human behavior. To give but one example, Jaques (1956, 1961, 1970) uses psychoanalytical theory as his frame of reference to explain the psychological effect of overcompensation (1956, p. 3, 113) and undercompensation (1956, p. 29). It seems appropriate for the present to assume only outcome manipulation is a realistic possibility for resolving cognitive inequity and that it may be used by a given individual in a given situation.

---

[1]Of course this excludes collective activity inherent to organized labor or other organized means employees might use as a group to alter their outcomes.

Person Distorting His Inputs and Outcomes Cognitively

Adams (1965, p. 290) notes that Person may use cognitive manipulation to reduce inequity. Person may use cognitive manipulations on his inputs or outcomes with equal effectiveness. A cognitive change of inputs and outcomes has to do with altering the importance or relevance of factual events or data. In effect cognitive manipulation involves changing the meaning which Person attaches to objective reality. Embodied in this is perception and Person's operating frame of reference which in turn determines how Person internalizes certain happenings and acts out certain behaviors. Adams points out rather clearly that cognitive activities are not unrelated to reality, and, indeed, are well founded in facts. Examples of "facts" would be age, education, training, salary level and other information items that can be clearly documented.

Evidence is sorely lacking as to how and when cognitive manipulation may occur in any given individual. This previous statement is in agreement with Adams (1965) and Weick (1967). For the time being this consideration will unfortunately have to remain in the realm of speculations.

Person Leaving the Field

"Leaving the field" means that Person severs relationships with the source causing inequity. This may take the form of quitting, being absent, or transferring. These are rather dramatic means for dealing with inequity but are

commonplace in industry. Like cognitive manipulation of inputs and outcomes there is little supportive information, as it relates to equity theory, for these means of inequity resolution. A study by Patchen (1961) observed that absenteeism was higher among employees who felt undercompensated. Patchen viewed absenteeism as a form of withdrawal.

One consideration which did not receive attention by Adams is that a Person may withdraw from an organization in a cognitive manner--he becomes disinterested yet remains on the job. This person may not involve an Other for comparative purposes and may not be affected by equity considerations unless they are extreme.

Person Acting on Other

Person may choose as a means of inequity reduction a change in the Other who is then used for comparative purposes.[1] Patchen's 1961 study specifically directed its procedures so that identification of the appropriate Other could be made. The comparator Other for Patchen's study was often a member of another organization. The selection of Other outside the organization has resulted in some criticism, notably by Adams (1963a). Adams (1965, p. 294) points out the change of the comparator Other may be a difficult

---

[1]An interesting side issue is that Person may redefine his comparator for many reasons. For example, when a person is promoted he usually adopts a new reference group. This seems to be among other things a means for establishing a new equity comparison, which in turn may become a source for both present and future perceptions of inequity.

accomplishment.[1] Adams feels that the longer a comparator Other has been used by Person for these purposes the more difficult it is to change. A change in the comparator Other often results in an "extremely unstable" (1965, p. 294) situation unless the change was accomplished by a change in Person's perception. There is a possibility that this speculation is not carried far enough for two reasons. First, it apparently assumes there is a singular comparator Other, while, in actuality, there may be several or many comparator Others within and without the organization as Patchen (1961) suggests. If this were true then the process of conversion of the comparator Other may not have such a potentially unsettling character. Second, in a cultural environment that validates aspirations "to get ahead" competition would then seem to necessitate constant change in a comparator Other. Either Person or Other will always be changing. The point being, Adams' supposition seems to be set in a static rather than a dynamic context.

Choice Among Modes of Inequity Reduction

Adams (1965, p. 295) uses choices of modes for two purposes: first to summarize all the previously discussed means for inequity reduction, and second to identify propositions about conditions that determine Person's choice of modes noting that they are seldom independent. As these are

---

[1]It should be noted that Adams is referring to an exchange relationship where a third party such as management is involved and is more complex than a simple one-to-one exchange.

guidelines for prediction and are relevant to all of Adams' (1965, pp. 295-296) work they are quoted in their entirety:

> (a) Person will maximize positively valent outcomes and the valence of outcomes.
> (b) He will minimize increasing inputs that are effortful and costly to change.
> (c) He will resist real and cognitive changes in inputs that are central to his self-concept and to his self-esteem. To the extent that any of Person's outcomes are related to his self-concept and to his self-esteem, this proposition is extended to cover his outcomes.
> (d) He will be more resistant to changing cognitions about his own outcomes and inputs than to changing his cognitions about Other's outcomes and inputs.
> (e) Leaving the field will be resorted to only when the magnitude of inequity experienced is high and other means of reducing it are unavailable. Partial withdrawal, such as absenteeism, will occur more frequently and under conditions of lower inequity.
> (f) Person will be highly resistant to changing the object of his comparisons. Other, once it has stabilized over time, and in effect, has become an anchor.

These propositions represent a considerable range of potential influences on behavior. Social, psychological, and economic behavior (assuming they can be effectively separated) are evident. Aside from pointing out future directions for research, Adams' propositions may provide a degree of understanding as to why his theory is placed in a relatively abstract input and output model.

Adams' conclusions to his 1965 article, which are taken as his conclusions for all research on equity theory as this is his last published study, summarized succinctly: injustice underlies a significant portion of cases of dissatisfaction and poor performance. Adams' conclusions add to the evidence supporting a need for greater understanding

of equity compiled earlier by Jaques, Homans, Patchen, Thibant and others.

Summarizing this section, several salient points concerning Adams' contributions are evident. Equity theory is a social psychological theory that involves a Person, who is the focus of interest in Adams' equity research, the comparator Other who is used by Person in establishing a standard of fairness, and cognitive processes of Person that are symbolized by Adams in his input and outcome ratio. Person's cognitive processes are always seen exerting energy to maintain or restore a state of equilibrium. When Person's inputs and outcomes are in balance then equity is perceived to exist by Person. Imbalance can come about when the ratio of Person's inputs and outcomes is greater or less than the input-outcome ratio of Other. Inputs of Person may be performance, loyalty, getting to work on time, etc., and usually are not controlled by the institution Person is associated with in terms of the exchange relationship. This present study, following the lead of Adams and others, uses performance as the input variable and pay as the principal outcome variable for Person. Most of this section has been a presentation of how Adams went about testing this relationship within the framework of equity theory and a summarization of the results he obtained. The next section contains descriptions of the approaches which researchers other than Adams have used to examine the pay and performance relationship within the equity theory framework. The section begins with a review of works by Jaques, Homans

and Patchen which preceded Adams' research. The main thrust of each man's research will be described followed by some comments relating his work to that of others. Then a number of more contemporary reports will be reviewed in which actual experiments were conducted to examine some element of equity theory.

Section 2: Review of Empirical Literature

Jaques

Jaques' major work appears to be Equitable Payment (1961), and along with his other works, covers a comprehensive spectrum of considering a specific type of work task for a given employee and his relationship to society. Space limitations require that this discussion be confined to Jaques' concerns of this study. Jaques postulates that every employee has an intuitive "capacity for discriminating expenditure" (1961, p. 18). This is Jaques' way of describing Adams' input to outcome ratio. Furthermore this capacity is related to the individual employee's ability to handle the responsibility of the work assigned. Fulfillment of this responsibility yields a dynamic psychological equilibrium if the economic factor is realized. Level of pay in relation to the employee's capacity and to other work variables forms the psychoeconomic equilibrium link between the individual and the organization. Jaques' "felt-fair pay" appears to refer to an identifiable pay level that is considered by an individual employee for a given work task. It is notable that the idea of fair pay, as

perceived by the individual employee, is an expansive concept according to Jaques. Fair pay is the result of the number of inputs from within the individual, the organization and from the society.[1]

Jaques (1961) examines the idea of specifying individual career pay curves through what he terms the "standard payment and progression method." Analyzing pay histories of 250 male workers Jaques defines a group of negatively accelerated pay curves between the ages of twenty and sixty-five. As plotted by Jaques the curves rise rapidly in the younger age ranges and slow down at older ages. The pay curves do show a greater rate of progression at higher earning levels. After smoothing the curves, which Jaques calls standard earnings progressions, the curves follow "the sigmoidal progression characteristic of biological growth" (1961, p. 185). This smoothed curve then provided Jaques with a basis for his payment theory. Jaques believes his standard earnings progression represented a close approximation to the lines of growth of "time-span of discretion" in individual employees. Briefly defined the time-span of discretion is the maximum period of time during which the work assigned by the superior requires judgment in his job without these actions being subject to the manager's review. This became, for Jaques, a yardstick for comparison between job levels. The relevance of this to

---

[1]Jaques' fair pay derivation does not focus on the individual's cognitive manipulations (in the nature of ratios) and the comparator Other as does Adams.

equity theory was that jobs with different contents, but with the same time-span of discretion, were perceived by the employee to be equitable relative to performance and pay. Jaques' assumption that individual employees seek equity of pay and performance will have a pay curve as determined by: (a) measuring the employee's present time-span of discretion and the equitable pay for that time-span; (b) plotting historical pay for the employee; (c) having management assess employee performance; and, (d) management bringing pay and performance into equality.

Jaques' efforts have stimulated both psychologists and compensation theorists[1] as well as Adams. Jaques' efforts have been viewed as supportive of research on work satisfaction and on cognitive dissonance approaches to pay and performance. Jaques appears to be in agreement with equity thought in that a balance of pay and performance are a legitimate concern; however, this is a tenuous connection as Jaques' orientation requires that he give more attention to the idea of work itself. Jaques sees work as providing a fundamental frame of reference for the individual and it is the work itself that is of the essence. This places both pay and performance, which are primary concerns for Adams, in a secondary position.

No researcher can deny the importance work may have but its meanings are not only difficult to assess but are also highly variable within any given population.

---

[1]See Weick (1966, p. 233), Smith (1964, p. 330-332) and Belcher (1965, p. 177, 233), for examples.

It is difficult to evaluate Jaques' contribution to present equity theory as his efforts are quite unique. Of special value is his use of historical data for determining future pay; but overall his theory appears to have marginal capability in determining a possible connection between pay and performance with respect to quantitative measures.

Homans

Homans (1953) carried out a study to determine the impact of social injustice on worker dissatisfaction, and the results were later amplified in Homans' 1961 publication. Homans (1953) concludes that a person's job satisfaction is determined by the results of a person's comparison of his inputs and his outcomes. The main points of Homans' concept can be cast in Adams' (1965) terminology, as follows: the perceived equity of a person's pay is determined by the balance of the input and outcome ratio; equity influences the worker's satisfaction and this, in turn, is reflected back into inputs and outcomes. The crucial element is the resulting input and outcome ratio; and it is the element most difficult to assess because it is a cognitive experience.

Homans' study involved a number of clerical workers who were paid the same pay scale but who performed different tasks. The tasks were described as cash posters and ledger clerks. Cash posters made entries of paid bills on customer account cards. The cash posting work was rather monotonous and was considered to be a prerequisite for holding the ledger

clerk position. Ledger clerks recorded address changes, recorded under and over payments (from customers), and interacted with other employees and customers on a routine basis. Ledger clerks held a higher status than cash posters. Inputs for Person was seniority and higher skill. Homans concluded that approximately 75 percent of the ledger clerks felt the situation was unjust and they should receive more pay. Implicit in Homans' conclusions was that Person were ledger clerks, while Other were cash posters. It is interesting to note there was no recording of how the cash posters felt as equity theory would predict that inequality would exist for both groups.

There are a number of small but relevant differences between Homans, Jaques and Adams that seem to require elaboration. Homans' approach to inequity differs from Jaques' in two significant ways: Homans has a comprehensive framework of distributive justice, and Homans believes that Person is consciously aware of inequity. Schematically Homans' (1961) distributive justice is:

$$\frac{\text{Person A's rewards minus A's costs}}{\text{A's investments}} = \frac{\text{Person B's rewards minus B's costs}}{\text{B's investments}}$$

If the two ratios are not equal, then the person who is disadvantaged may feel anger or some other defensive mood, while the person who is advantaged may feel guilty or some other emotion. Homans did speculate that a higher threshold (his upward elasticity) existed for feelings of guilt as compared

to anger. This position is supported by both Jaques and Adams. The second difference between Jaques and Homans arises from Jaques' psychoanalytic orientation. Jaques (1961) says feelings of inequity are felt, or are unconscious, while Homans (1961) believes he has demonstrated a conscious awareness of inequity. Adams (1965) and Homans are in agreement on this matter.

There are no significant differences between Homans' "Distributive Justice" and Adams' equity theory other than Homans takes a comprehensive theoretical view. Although not as extensive, Homans' research generally has the same orientation as Adams' efforts. Homans views the cognitive interaction as an input and outcome ratio, which has a social psychological orientation that incorporates a comparator Other and sees rewards as coming from a third party.

Perhaps a concluding comment on the work of Homans, Jaques and Adams should reiterate that the differences in their theory and their conclusions are minimal. Each is attempting to provide a rationale for reconciling pay and performance so as to enhance industrial fairness. Each fully realizes he is dealing with an abstract social concept called fairness, justice or equity and each is attempting to employ a (somewhat different) methodology to make more concrete the elusive ideal of "what's right." A review of their respective approaches provides substantial testimony to the difficulty of reducing a social phenomenon to an identifiable and treatable character.

Clark

J. V. Clark's 1958 study is, as noted by Pritchard (1969), accessible only through Adams (1965) and is therefore limited to what Adams reported. Clark's study consisted of two groups of employees in a grocery store who performed checking and bundling activities. The checker had higher status, was better paid, and was usually older than bundlers. Clark indicated that psychologically the bundlers were working for the checkers. It is assumed from the information offered this was a commonly shared view held by both bundlers and checkers. Equity problems would arise when the status system of the checker and bundler relationship was disturbed. For example a college boy who was employed part-time as a bundler was placed in a situation with a younger but full-time checker. In equity terms this means that the college boy bundler viewed his inputs as being greater and outcomes less than the younger, less educated checker. Of special interest is that Clark's study identified store management as being involved in the relationship between the checker and bundler. Bundlers who perceived an inequity reduced their inputs by slowing down production; this was an overt effort to restore balance between inputs and outcome which involved management and bundlers but excluded the checker who was the comparator Other (Adams' terms). While Clark collected his data by interview, like Homans (1953), he also included a measure or organizational effectiveness in that when no or little inequity existed between checkers and bundlers relationships in a given

store, that store maintained a higher average of productivity and profit profile.

Patchen

Patchen's (1961) work was explicitly designed to test certain extensions of the cognitive dissonance theory. Patchen dealt with overpayment only to a small degree and, like Clark (1958), focused most of his efforts on undercompensation. Patchen, like Homans (1961), presents a framework for structuring ratio relationships. Patchen (1961, p. 14) postulates that equity is achieved when the following two ratios are in balance:

$$\frac{\text{My Pay}}{\text{His (their) Pay}} \quad \text{compared to} \quad \frac{\text{My position on dimensions related to pay}}{\text{His (their) position on dimensions related to pay}}$$

As Patchen's specific emphasis is on pay, as is Adams', his ratio is worded differently than Homans'. Relative to Homans', Patchen's ratio is restructured but the effects are the same, and neither configuration is different from Adams'. A unique aspect of Patchen's paradigm is that his approach involves a concept of potential, or future, perceived equitable payment.[1] They may be demonstrated as:

$$\frac{\text{My pay now}}{\text{His (their) pay now}} \quad \text{compared to} \quad \frac{\text{My future positions on dimensions related to pay}}{\text{His (their) present position on dimensions related to pay}}$$

[1]In addition to its obvious resemblance to expectancy motivational theory, Patchen's approach has a distant

Patchen's data for substantiating his theory were gathered by interviewing employees in a Canadian oil refinery. Skilled and unskilled employees were asked to name two persons either inside or outside the firm whose earnings were different from theirs. Patchen's results generally show that the closer the status of the Person and Other and the greater the difference in pay the greater is the perceived inequity. This is consistent with Weick's (1966) findings. It does not, however, indicate how the Person changes his inputs in order to restore congruence in his "system" but merely indicates that dissatisfaction exists. This appears to be sufficient for cognitive dissonance theory, and also generally supports a proposition contained in both Adams' and Homans' equity theory.

Lawler and O'Gara

Lawler and O'Gara (1967) investigated underpayment on the basis of equity theory. This study focused on discriminating between measures of performance in terms of quantity and quality and on mechanisms of inequity resolution. Of special interest to this present research is the use of separate measures for quality and quantity. Equity theory would predict in a perceived situation of underpayment that Person would produce more quantity but of a lesser quality. Lawler and O'Gara's results supported this contention. Lawler and O'Gara also attempted to demonstrate that certain job

---

resemblance to Friedman's Permanent Income Hypothesis. Although Patchen's considerations of the future may add elegance to his formulation it also adds yet another set of confounding variables.

characteristics impacted on perceived inequity. Conclusions resulting from this effort were mixed principally because a dissimilarity between inputs and outcomes could not be determined. The problem, according to Lawler and O'Gara, is that equity theory is apparently unable to predict a priori whether a job characteristic is an input or outcome. Simple-minded as it might seem, the explanation may be that in the eyes of the beholder Person defines his own unique contents for input and outcome modes. This characteristic does not presently appear to detract from equity theory functioning as a framework for compensation research.

Although each of the preceding studies has a basis in research they also contain large elements of theory and philosophical considerations, the following contributions to equity thought represent somewhat different approaches. These approaches may be divided into two groups: one group of researchers who have evaluated equity theory, and particularly those predictions made by Adams, through additional experimentation consists of Weick (1967), Lawler and O'Gara (1967), Andrews (1967), Goodman (1967), Lawler, Koplin, Young and Fadem (1968), Goodman and Friedman (1968) and others; the other group includes Opsahl and Dunnette (1966) and Pritchard (1969) who have reviewed the research of others without additional original experimentation. In the ensuing discussions the members of these respective groups, indeed if the foregoing reasons are adequate for group assignment, will be discussed on a chronological basis.

Although Lawler has made significant contributions to the development of equity theory two of his earlier efforts[1] will be summarized only briefly. The main emphasis here will be placed in Lawler's 1968 article where he contrasts equity and expectancy theories and presents his conclusions regarding the predictive value of equity theory.

The Lawler et al. (1968) study did not manipulate qualification instructions so as to avoid the self-esteem problem said to exist for the Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) studies.[2] Lawler and O'Gara's 1967 study consisted of taking measures on work performance, attitude and personality for all subjects. This study focused on piece rate and also incorporated an underpayment condition for pay.

The results generally supported inequity theory. Lawler and O'Gara also identified differing modes of inequity reduction among the experimental Ss. Generally they found that Ss with high poise and self-assurance tend to be low producers and those Ss with high maturity and responsibility scales tend to produce higher quality.

The Lawler, Koplin, Young and Fadem (1968) study is unique in that it compared equity to expectancy theory. Little will be discussed here other than to state the predictions they made on the basis of equity and how well these

---

[1]The Lawler and O'Gara (1967) and the Lawler, Koplin, Young and Fadem (1968) studies will be briefly summarized with a special emphasis on their respective unique contributions.

[2]Ibid.

predictions stood up to predictions made on the basis of expectancy theory. Lawler's et al. (1968) experiment divided ninety subjects into two groups: an overpaid group and an equitably paid group. According to Lawler et al. (1968), equity theory would predict those Ss who perceived themselves as overpaid would decrease productivity and increase quality; this prediction was supported during the first of the three trials. Expectancy theory would predict that Ss would behave in such a way as to maximize their long range gains;[1] this prediction was supported for the third trial only. The results of the experiment was that equity theory predictions were supported during the first trial of the three trials; expectancy theory was supported for the third trial only. Equity theory predicts that productivity will decrease while quality will increase in an overpaid situation. In Lawler et al. (1968) that occurred for the first trial but reversed itself for the last trial relative to productivity. Lawler et al. (1968) cites these results as support for expectancy theory. One wonders about the possible impact of a learning curve on the interpretation of these results.

In a second study Lawler (1968) continues the development of a methodology for comparing equity and expectancy theory. Sixty college and non-college subjects were hired to conduct interviews in three two-hour trials. They were divided into three groups of twenty subjects each: equitably paid

---

[1]After a thorough review of the article this researcher is still not clear as to what this prediction entails.

subjects, unqualified overpaid subjects, and subjects overpaid by circumstance. All subjects were paid an hourly wage of $3.50. According to Lawler et al. (1968) equity theory would predict that a perceived overpayment would result in high quality and low production. This is in accordance with Adams' et al. (1962) findings. Lawler's findings were that significant differences were present between the equitably paid and the unqualified group. Expectancy theory, again according to Lawler et al. (1968), would predict that overpayment in an hourly situation would not lead to a higher quality or higher productivity performance. This prediction was borne out.

Andrews' (1967) study involved ninety-six college students in two tasks at three different piece-rate levels. The two tasks were interviewing other students, considered by Andrews as the interesting task, and checking data sheets which was considered the dull task. The three variables tested in this experiment were task interestingness, the effect of past pay level and different piece-rate pay levels. Based principally on the findings of Adams' previous works (1962, 1963a, 1964) Andrews' research found that equity predictions were supported relative to underpaid Ss who maintained equity by increasing work quantity at the expense of quality, and overpaid Ss who maintained equity by reducing quantity and increasing work quality. Andrews also substantiated, somewhat marginally however, that past pay experience affected the present meaning of pay. The hypothesis about task differences

affecting equity was not supported by the data. This last finding seems to deserve some elaboration. Keeping in mind that Weick (1964) felt on the basis of his research that equity predictions about task attractiveness are difficult to make then possibly Andrews' (1967) findings are not as negative as they seem. Pritchard (1969) takes a similar view. Based on Adams (1965) one could also speculate that the Ss selected another mode of inequity reduction. This position seems feasible although it would automatically point out a possible problem in Andrews' (1967) research design.

Pritchard (1969) feels the most salient finding of Andrews' (1967) study is that underpaid piece-rate employees do produce more than normal or overpaid piece-rate workers. Because of statistical problems (according to Pritchard (1969, p. 194) Andrews used a multiple t test instead of an analysis of variance) the prediction of past wage impact on present pay was not substantiated. In regard to overpayment it appears that it was not significantly different than underpay. It should be added that underpay quantity production was significantly different than normal or overpaid piece-rate pay.

In conclusion Andrews' (1967) study asked some provocative questions that remained unanswered chiefly as the result of inadequate research design and statistical verification. It is regrettable that no one picked up on what may have been a principal problem of Andrews' study: the pay thresholds were too insignificant to produce the predicted results. Jaques (1961) and Adams (1965) earlier identified the

importance of this factor and both considered it at length. It is therefore suggested that the results for all of Andrews' predictions may have been more dramatic if there had been a greater difference between the piece-rates.

Friedman and Goodman (1967) state with just cause that certain relevant variables were not controlled in the Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) experiments. These researchers point out that in the earlier Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) studies the S's perceptions of his qualifications were ignored.

The Friedman and Goodman study involved fifty-four students who were hired on an hourly basis of $3.50 for interviewing tasks. The Ss were divided into an experimental group and a control group. In general, this study followed the unqualifiedness manipulations and the experimental design of the Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) studies, but two new sources of data were used: all students completed a demographic questionnaire that included past work experience and an interview questionnaire which gathered information on task difficulty.

Results of the Friedman and Goodman study indicated there were no significant differences between the unqualified control and experimental groups. However there was a significant difference between the qualified control and experimental groups. Friedman and Goodman speculated that pre-experimental cognizance about qualifications, task difficulty and the Ss'

perception of experimental manipulation are relevant considerations and were not error variances.

The purpose of Friedman and Goodman's study was to focus "on the operational specification of wage inequity theory and not the theory itself" (1967, p. 414). Stated another way, Friedman and Goodman's study was an evaluation of Adams and Rosenbaum (1962) and Adams and Jacobsen's (1964) examination of cognitive dissonance in terms of wage inequity. Friedman and Goodman's conclusion appears to be that Adams and Rosenbaum and Adams and Jacobsen's findings are situation specific. There appear to be several conclusions in Friedman and Goodman's experiments that are difficult to place in perspective. Friedman and Goodman changed the operational procedures for their experiment and therefore did not truly replicate the previous Adams' et al. study. Two dissimilarities may be mentioned: Friedman and Goodman paid subjects on an hourly basis, but the Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) were piece-rate studies and only one of the studies (Adams and Rosenbaum, 1962) had hourly pay; secondly, Friedman and Goodman utilized a different means for discriminating between control and experiment groups relative to qualifiedness. Nevertheless, Friedman and Goodman often approach their evaluation as if their study was similar to Adams' work.

In conclusion Friedman and Goodman added to the fund of knowledge required for the continued development of equity theory by pointing out the need for a highly controlled

design if questions concerning internal validity are to be avoided.

Goodman and Friedman (1968) deal with overpayment of hourly conditions on job performance, the possible relationship between quantity and quality of job performance and the impact of known production rates on equity resolution strategies. Unlike the 1967 study only unqualified students were used as subjects. There were six experimental groups which utilized a total of seventy-three male students.

Goodman and Friedman (1968) created the image of overpay by unqualifiedness manipulation as in the Friedman and Goodman (1967) study. Four experimental groups were paid the hourly $3.50 rate, and two experimental groups were paid $2.50. Quantity differences between the overpaid qualified group as compared to the underpaid qualified group did not appear to be significant although they were in the predicted direction. In those conditions where production rates were known there was significantly less production variance than where production rates were unknown.

In general the Goodman and Friedman experiment supported Adams' inequity predictions. However, as was noted in the discussions concerning the Friedman and Goodman (1967) study, the procedures were somewhat changed again. Goodman and Friedman's (1968) findings are also inconsistent with the "overpaid by circumstance" group in the Lawler et al. study. Goodman and Friedman argue with reasonable justification that perceived inequity by the Ss in the Lawler et al. (1968) study

was actually not perceived as being unfair inasmuch as they were paid a standard government rate. Moreover Lawler et al. did not eliminate qualified Ss.

Aside from the Friedman and Goodman (1967) study, the Goodman and Friedman (1968) and Goodman and Friedman (1971) reviews generally appear to support Adams' predictions concerning inequity theory. The frequently encountered issue of whether cognitive dissonance is adequate or inadequate is noticeably lacking in the later Goodman and Friedman (1968, 1971) reports just as it is in Adams (1965). This is fortunate in that it reduces the inherent complication of the examination and evaluation chore when two complex concepts are involved. This reviewer had the feeling that in their 1967 study Friedman and Goodman were evaluating Adams' extension of cognitive dissonance vis-a-vis inequity theory predictions rather than evaluating inequity theory in and of itself. Cognitive dissonance exists as interesting and challenging theory in its own right, as does equity theory. Admittedly the two have great similarities which is a credit to both but then so does equity theory and exchange theory. The comment made earlier still stands in that Goodman and Friedman's work has added to equity theory.

Dimick (1973) uses a rationale much like that employed by Lawler (1968b) but develops an innovative methodology for comparing equity and expectancy: a computer-based simulation compares the effects of various pay policies on a given population. Pay policies are the independent variables; pay costs

(an often neglected factor) and performance are the dependent variables; and the ratio of performance to pay is an index of pay efficiency. Four decision rules that reflect administrative concerns are used as constraint conditions: "(1) no constraint, (2) decreases in pay prohibited, (3) raises limited to 4 percent to 10 percent, and (4) both (2) and (3)." The simulation model is set up to represent a twenty year timeframe to fully examine the longitudinal effects of various pay policies. The results, for the purposes of this study, are that expectancy theory and equity led to parallel recommendations. Assuming there is an adequate basis for comparison of Lawler's (1968b) conclusions Dimick's assertion tends to reduce the meaningful difference between expectancy and equity theories.

Wiener (1970) specifically designs an experimental methodology to examine the possible "self-esteem" problem that many researchers had noted in the studies of Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) and Adams (1963a). Wiener (1970) set up two conditions of inequity and a control condition for equity. Input overcompensation conditions were created by telling subjects they were unqualified but would receive the standard pay of $2.00 per hour. Outcome overcompensation was created by telling the Subjects they were qualified for the task and would be paid $3.00 an hour which was higher than the standard pay. Within each of these conditions (input overcompensation and outcome overcompensation) one-half of the Subjects were induced to believe they were involved in

the development of mental alertness tests which were defined by Wiener as the "ego-oriented" performance. The other subjects were induced to believe they were working on a psycholinguistic project which was defined by Wiener as a "task-oriented" performance. There were ninety-six college students employed as subjects and were divided into six groups: four experimental groups and two control groups. There was one trial seventy minutes in duration.[1]

Wiener (1970) came to two conclusions as based on his experiment: First, input overcompensation was not proved to produce dissonance or perceptions of inequity. Wiener interpreted his findings as substantiating other researchers' conclusions that inequity was really a case of devalued self-esteem on the part of the subject. Second, outcome overcompensation was somewhat tentatively proven to support Adams' inequity predictions. Wiener, however, did not view these findings as conclusive. Aside from the finding on outcome overcompensation for hourly pay Wiener was in agreement with Friedman and Goodman (1967), Weick (1967) and others in that the self-esteem problem probably confounds Adams' findings. In truth, Wiener (1970) felt that his findings demonstrate a lack of support for the validity of inequity theory.

The preceding discussions have centered on selected research that is thought to have a direct bearing on this present research effort. It is not, however, representative

---

[1]The majority of this paragraph closely follows the abstract of the Wiener report, see page 191.

of the total thought generated by Adams' efforts. The remainder of this section summarizes five authors who evaluate equity by comprehensively reviewing the progress made up to the time of their publications: Opsahl and Dunnette (1966), Weick (1966) and Goodman and Friedman (1971). In general terms all of these authors agree as to the benefits that have been produced as a result of continuing equity research and the deficiencies of that research.

Opsahl and Dunnette (1966)

These authors focus on the research that was oriented towards demonstrating the role of money (pay) in relationship to on-the-job behavior. It is their belief that the majority of literature and research has largely ignored the relationship of wage and salary practices to job behavior. The theories and studies selected by Opsahl and Dunnette on the basis of their presumed capability to "illuminate possible effects of financial compensation for inducing greater effort in the job setting, 'they' ignore those theories and studies related to money's effects in inducing employees to take jobs, persist in them, or to leave them (1966, p. 94-95)." Opsahl and Dunnette's approach is first to consider money as a generalized conditioned reinforcer, a notion which drew considerable support from the literature of experimental psychology. Their conclusions (1966, p. 97) agree with Adams (1965) in that the meaning of money for a given individual requires additional clarification. Considerably more

information will be required to accurately identify "the relevant factors associated with money as a motivator of behavior in industry" (1966, p. 97).[1]

Paraphrasing Opsahl and Dunnette, the principal problem in current industrial compensation consideration is the determination of the effects of money on worker behavior. Opsahl and Dunnette evaluated many different approaches to this problem among which was an extensive review of equity theory research carried out by Homans (1961), Jaques (1961), Patchen (1961), and Adams (1963a, 1965). The emphasis of this immediate discussion will be concerned with Adams as it is his approach to equity theory that is the immediate concern of this study.

Opsahl and Dunnette (1966, p. 113) base their position on conclusions reached earlier by Vroom (1964) and Weick (1965) and hold that Adams' inequity theory requires improvement in two major areas: (1) inequity theory fails to specify modes of inequity resolution a person may choose in a given situation, and (2) the large number of variables with complex interrelationships that exist within the theoretical framework

---

[1]As a point of clarification Adams does not place money in this role as a motivator; instead he places money in the context of the exchange relationship where its value is determined in the context of what is to be exchanged. This placement however should not be confused with the symbolic role that Vroom (1964) places money relative to his instrumentality valence theory (nor Gellerman (1963) for that matter).

of equity theory.[1] In response to the first need for improvement (which is Weick's criticism), there is little defense; Adams (1965) indicates there are a number of modes that may be chosen by Person to resolve an inequitable situation. However Adams' research was attempting to demonstrate only the resolution of pay and performance and as such is so stated. Other modes of resolution remain to be tested, and exist for the present as theoretical speculations. If Weick is implying equity theory is presently incomplete then he has agreement on this matter.

The call for the second needed improvement (which derives from Vroom's (1964, p. 171) criticism concerning the large number of variables) is also justified. Adams has also acknowledged this. Recognition of this problem has influenced the research strategy which is one of attempting to first measure the relative meaning of pay and performance; however, even this commonsense approach has experienced a complexity.

Opsahl and Dunnette (1966, p. 113) see Adams' work as a commendable initial effort in solving an admittedly large problem for industrial compensation. Their identification of existing deficiencies and problems in equity research is presently correct. Because of their orientation Opsahl and Dunnette have taken a more comprehensive view of compensation

---

[1]Significantly these authors discuss (p. 111) the self-esteem problem which had been pointed out by others, but rather than viewing it with any great alarm, they approach it as a solvable methodological problem. It should be mentioned this view is shared by Adams (1965, p. 46).

than does Adams' inequity research; however this is an ambitious view and is beyond the scope of Adams' research or this present research.

Weick (1966)

Weick's (1966) examination of equity theory is more focused than Opsahl and Dunnette's (1966) as it specifically relates to Adams' formulation of inequity theory. He begins with an excellent and simple presentation of what equity is and how it operates and then proceeds to discuss the problems as he sees them with the principal focus being on Adams' lack of clarity in his definition of terms. These discussions will generally follow Weick's presentation format. Weick identifies certain "ambiguities in the formulation of equity theory" (1966, p. 415), chief among these being the uncertainty of what constitutes an input, or an outcome, in a given situation. Unless this discrimination is clear, according to Weick, the predictive capability of equity theory is reduced. Continuing with this thought Weick (1966, p. 419) maintains that while an adequate discrimination may be made in the laboratory such a discrimination may not be possible in the work environment. Weick (1966, p. 420) illustrates his contention through an analogy based on the "sweat" a worker might produce as a result of exertion; he asserts that "sweat" may be an outcome or input, depending on one's perspective. It is difficult to see the merit of this argument and analogy in the context of the formal organization exchange that takes place between the

worker and the organization. Perspiration is a by-product of work (performance) in a given job and it is the work itself that is clearly the input for Person (Adams' term), and pay is clearly the outcome. In other words, in Adams' theoretical formulation inputs and outcomes are organizationally and personally defined. While one cannot deny the existence of other forms of inequity resolution (beyond more or less pay, or more or less performance) present research has not been extended to examine them. To date Adams has confined his efforts to considerations of the formal relationship between the individual worker and the organization. Informal modes of inequity resolution are no doubt present and utilized; but at the present any comments about their impact must be speculations. This particular criticism, like much of the other criticism surrounding modes of inequity resolution, is based on informal organizational phenomena, which as stated before, is beyond the present development of the theory.

Weick's (1966, p. 422) second problem has to do with the inherent dynamics of maintaining a balance for a given individual's ratio. The argument goes something like this: if Person perceives an imbalance when he compares his inputs and outcomes to Other's inputs and outcome ratio, he will initiate activities to bring about a balance (e.g., do away with dissonance). If he is successful, then what results could possibly create an imbalance for Other. Of course Weick's argument assumes Other perceives balance with the initial relationship. Whether this is true or not depends on

both Person and Other using each other as their respective comparator. This may not be the case. However assuming this relationship does exist then Weick is correct in asserting that an oscillation would be set in motion and that a perpetual imbalance would result. Adams' inequity theory presently has no means to resolve such a problem of interdependence. It is suggested that over time, assuming the cognitive dissonance theory is correct, some other form of dissonance mode will be engaged by Person and/or Other to bring about balance.[1]

Weick (1966, p. 427) poses an interesting problem for equity theory in the nature of the social isolate. In effect this eliminates Adams' comparator Other and instead postulates a strong influence of an individual's internal standard.[2] The manner in which Weick approaches this consideration is that there is a lack of social impact on the person. This is difficult to accept as it is obviously in disagreement with the idea of social man. The existence of such a personality would surely be an exception to the rule. Adams's theory is

---

[1]This line of thought comes close to a basic contention of inequity and cognitive dissonance theory in that both Person and Other see a need on the part of the individual to obtain a cognitive state of balance. In effect this need provides the basis for drive that usually exhibits itself in a form of overt behavior.

[2]This line of thinking is also pursued by Jaques but in a different context. Jaques too postulates there exists for the individual an internal standard that is used to determine the unfairness of a situation. Adams also postulates this in his ratio which is a weighted average of inputs and outputs (1965, p. 281) but in the context of an interaction with the comparator Other.

a theory of how "normal" behavior might occur and not a theory of abnormal behavior.

Weick (1966, p. 438) correctly contends that part of the problem of working with equity theory lies in Adams' use of the ratio. The ratio admittedly is an overly simplified approach but it does provide a means for reducing the exchange concept from a broad paradigm to a more workable micro level. And although the micro level is not free from certain ambiguities it does provide a means for equity theory to be situation specific which would seem to lend it some capability for assisting the resolution of organizational process issues.

This discussion has considered Weick's (1966) major concerns of Adams' formulation of inequity theory. Weick's conclusion of equity theory's utility is that it is too soon to determine its value as a theory and that additional research is required, that equity theory requires a closer "scrutiny" (1966, p. 439), that equity theory seems to have use as a middle-range theory of organizational behavior, and that it has guided researchers into unfamiliar but highly relevant problem areas.

Goodman and Friedman (1971)

Goodman and Friedman's (1971) examination of Adams' inequity theory presents the most recent comprehensive review of equity theory. These authors (1971, p. 271, 274, 280, 285) tend to support Adams' inequity theory on the basis of a rather complete review of the research as of early 1971. This

positive interpretation, in several respects which will be enumerated shortly, is in disagreement with Opsahl and Dunnette (1966) or Weick (1966).[1] The Goodman and Friedman review examines a number of empirical studies that have tested inequity theory's predictive capability relative to pay and performance relationships. Goodman and Friedman utilize a format that begins with a specific problem as identified by another researcher. Goodman and Friedman then cite evidence that agrees or disagrees with this researcher's findings and conclusions.

Basic to the testing of inequity theory is the manner in which performance is related to inequity resolution. Although methodologies vary, the basic hypothesis relating to the overpaid hourly rate situation is the Ss will raise their productivity to balance the overpay condition. Four studies previously discussed tested this hypothesis and generally, but with some reservation, support the inequity theory prediction; at least three other studies were unable to support this hypothesis; and two others rejected the hypothesis.[2]

---

[1]As noted earlier in this section, Opsahl and Dunnette and Weick are in substantial agreement concerning strengths and weaknesses of Adams' inequity theory. This is reasonable in view of the possibility of information exchange between these three researchers when they were colleagues at the University of Minnesota in 1965-66. Professor Goodman is now on the faculty of the University of Chicago and Professor Friedman is on the faculty at the Hebrew University of Jerusalem.

[2]Arrowood (1961), Adams and Rosenbaum (1962), Goodman and Friedman (1964) and Pritchard (1964) support the prediction. Valenzi and Andrews (1964), Evans and Simmons (1969) and Anderson and Shelly (1970) could not support the prediction, and Lawler (1967) and Wiener (1970) rejected the prediction.

Examination of the nonsupporting studies indicates there is sufficient difference in methodology to warrant concern relative to their respective findings. This is in agreement with Goodman and Friedman's (1971) conclusions. This same principal criticism can also be justly leveled at the studies which support the hypothesis relative to the possible confounding character of the previously discussed self-esteem problem.

The general hypothesis relating to the underpaid hourly rate situation is that workers will decrease their inputs to achieve a cognitive balance. In addition to Adams (1963a) and Adams and Rosenbaum (1962) and Adams and Jacobsen (1964) four studies attempt to test this hypothesis. Goodman and Friedman (1971) feel the nonsupporting experiment failed to produce the necessary inequity conditions; it is speculated that the reason for lack of support was a function of too brief experimental timeframes. It would appear that for the present there is inadequate information for a determination of the underpaid hourly hypothesis.

On the basis of the Goodman and Friedman (1971) article two conclusions can be made about the validity of Adams' inequity theory:

1. There is relatively clear empirical support for the assumptions and hypotheses derived from Adams' inequity theory by Goodman and Friedman (1971) which are set forth below in brief form:[1]

---

[1]Obviously Adams and Adams et al. would support these findings therefore other selected researchers are used for

a. Inequity is a source of personal tension (Pritchard et al., 1970).

b. The greater the perceived inequity the greater the drive to reduce it (Weick and Nessett, 1968).

c. Thresholds for underpayment are less than thresholds for overpayment (Leventhal et al., 1969b).

d. Person maximizes positive outcomes in the resolution process (Leventhal and Michaels, 1969).

2. There is tentative empirical support for the following hypotheses and assumptions:

a. Person will resist changing the comparator Other (Weick and Nesset, 1968).

b. Overpaid-hourly Ss will produce more than equitably paid Ss (Pritchard et al., 1970).

c. Underpaid-hourly Ss will utilize relatively lower inputs than equitably paid Ss (Evan and Simmons, 1969).

The preceding conclusions are taken from Goodman and Friedman (1971) and from others and represent the most commonly agreed upon finding of inequity theory as it relates to Adams' (1965) theoretical premises and the scope of this study. This

---

reference. It should be noted that in some cases these referenced researchers do not support other predictions made by inequity theory.

evaluation is based on a review of relevant research and is somewhat selective. Other examinations are discussed elsewhere in this study.

Section 3: Theoretical Model Used for this Present Equity Research

Based on the findings and discussions presented in the preceding section, the following diagramatic model appears to be an appropriate representation of Adams' (1965) inequity theory.[1] The purpose of the model is to attempt to identify and relate diagramatically all of the theory's component parts. It should be noted that the model's design is based on a singular reconciliation of pay and performance which is viewed as being in keeping within the scope of the present study. Adams' terms are used wherever applicable.

Basic to Adams' conceptualization of inequity is a three part or triad relationship:

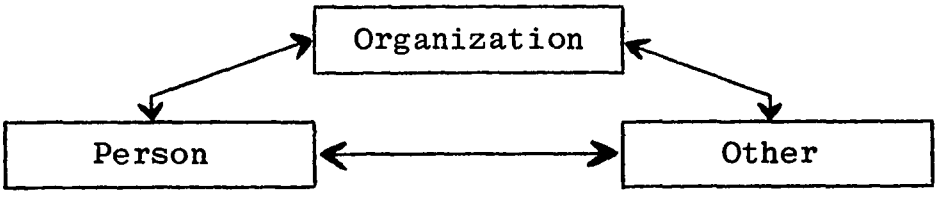


Figure 4. A Triad Relationship

Person is the focus of interest and his overt behavior is the subject of inquiry. Other is the individual used by Person for comparative purposes. Person uses the comparator Other

[1]Adams does not present such a model in any of the publications reporting on his examination and extension of ineuqity theory therefore this model has this limitation plus others normally inherent in such an offering.

as a measuring standard always comparing Other's input and outcome ratio to his own. Keep in mind this comparison is perceptual and unique to Person. Stated plainly, this comparison may not be what could be termed objective from another's frame of reference. Person and Other exist in an organization environment. The organization is represented to Person in the form of management which allocates rewards (Outcomes for Person) and requires contributions (Inputs from Person). The fundamental exchange act takes place therefore between Person and management who, collectively, embody the organization. Other is used by Person as a comparator verifying whether the exchange between Person and Other is equitable, or fair or just.

The exchange paradigm also encompasses the cognitive interaction of Person and is represented as a ratio of outcomes to inputs.[1] The principal problem is one of a ratio being viewed as overly simplistic. Symbolically this ratio is:

$$\frac{Op}{Ip} \quad \begin{matrix} < \\ = \\ > \end{matrix} \quad \frac{Oa}{Ia}$$

(Person) (Other)

Figure 5. The Basic Exchange Relationships

The purpose of this representation is to identify that Person views the ratio of his outcomes to inputs as being one of exchange in that something is given (the input) and

---

[1]This symbolization is characteristic of Adams, Patchen and Homans, and has been maintained, but not always supported, by other researchers.

something is received (the outcome) in a balanced exchange. Such a relationship is assumed to exist for a given situation. Adams (1965, p. 281) views inputs and outcomes as being respective sums of inputs and outcomes relevant to a particular exchange. In effect, the equity of outcomes to inputs are perceived standards that exist on a day-to-day basis and function as behavioral guides. Inputs and outcomes are symbolic and are maintained cognitively by Person.

As implied by the "equal to," "less than," and "greater than" symbols the outcome to input ratios may exist in any given time in a state of balance or imbalance. Any state (whether in balance or imbalance) provides the requisite tension for the drive necessary to elicit behavior. In other words, Person, even though in a balance state, will be motivated to demonstrate behavior. In the work environment Person will be motivated to perform (Person's input) those tasks perceived to be relevant for achieving the commonly understood outcome (pay). If a state of imbalance exists where Person is receiving more (over-paid, outcome) or less (under-paid, outcome) he will be motivated to alter the other portion of his ratio, which in this case is performance. Should this imbalance exist then Person experiences cognitive dissonance. The greater the dissonance in a given situation the greater the tension and, consequently, the greater the drive to restore balance. Adams utilizes cognitive dissonance theory as proposed by Festinger (1957) and Brehen and Cohen (1962). The cognitive comparison of the combined exchange theory utilizing

Person and Other and cognitive dissonance may be represented structurally as:

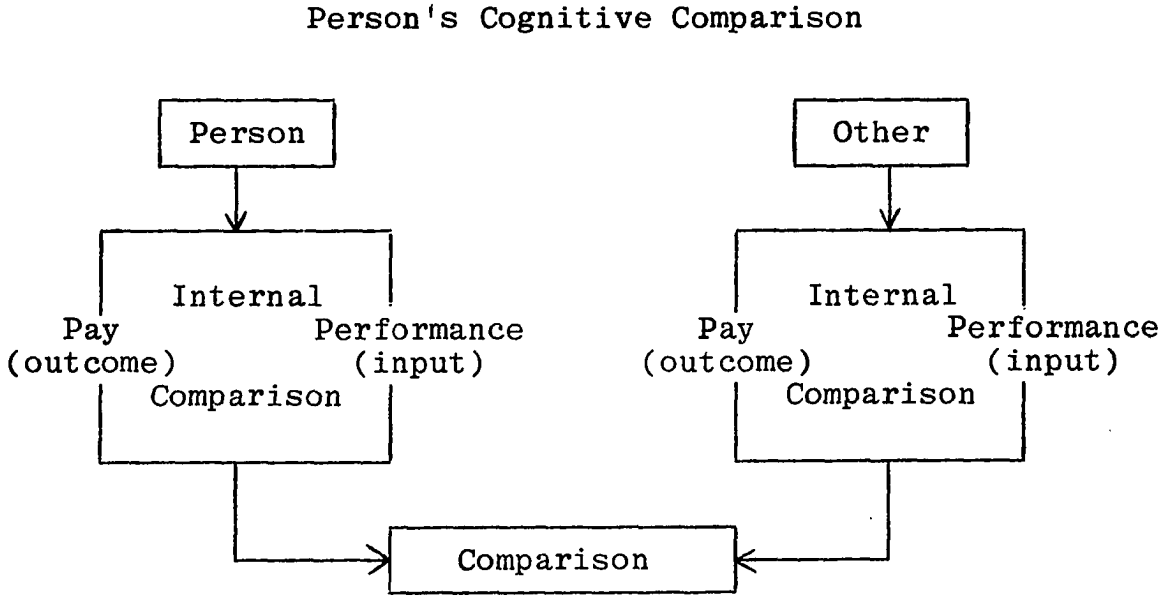


Figure 6. A Model of Person's Cognitive Comparison

Implicit in the discussions at this point are the following assumptions:

1. A comparison Other exists and is identified by Person,
2. A comparison actually takes place between person and Other,
3. Person views the relationship between himself and the organization as fundamentally an exchange,
4. Pay and performance are clearly identifiable as being either input or outcome by Person,
5. There is a three-way relationship among Person, Other and organization and each has a related and identifiable role relative to the others,

6. Person will actively participate in maintaining or restoring cognitive balance.

These assumptions represent the pillars of equity theory and represent those aspects of the theory which receive the greatest amount of attention from researchers. As indicated in earlier discussions in this section, the majority of empirical evidence tends to support these assumptions.

Possibly the least documented and understood character of equity theory is the process of interaction of the structural elements. Prior to gaining an understanding of the process of equity theory there seems to be a need for greater understanding of its structural character. While the process of equity is beyond the scope of the present effort there appears to be enough information at hand to warrant a tentative presentation of a structural organization of equity theory. The following diagram is a composite of the previous two diagrams (Figures 5 and 6) plus a few embellishments for clarification.[1]

This equity model may assume a state of balance, a starting point of equity, or a state of imbalance. Implicit is the simplistic notion that a stimulus will be followed by a response. The important point is that the model always seeks equilibrium and, therefore, is based on the very fundamental assumption that balance is natural. Another point of

---

[1]The reader is urged to keep in mind that this equity diagram is specifically oriented towards the pay and performance relationship which is the emphasis of this study.

Equity Model

Pay/Performance Conciliation

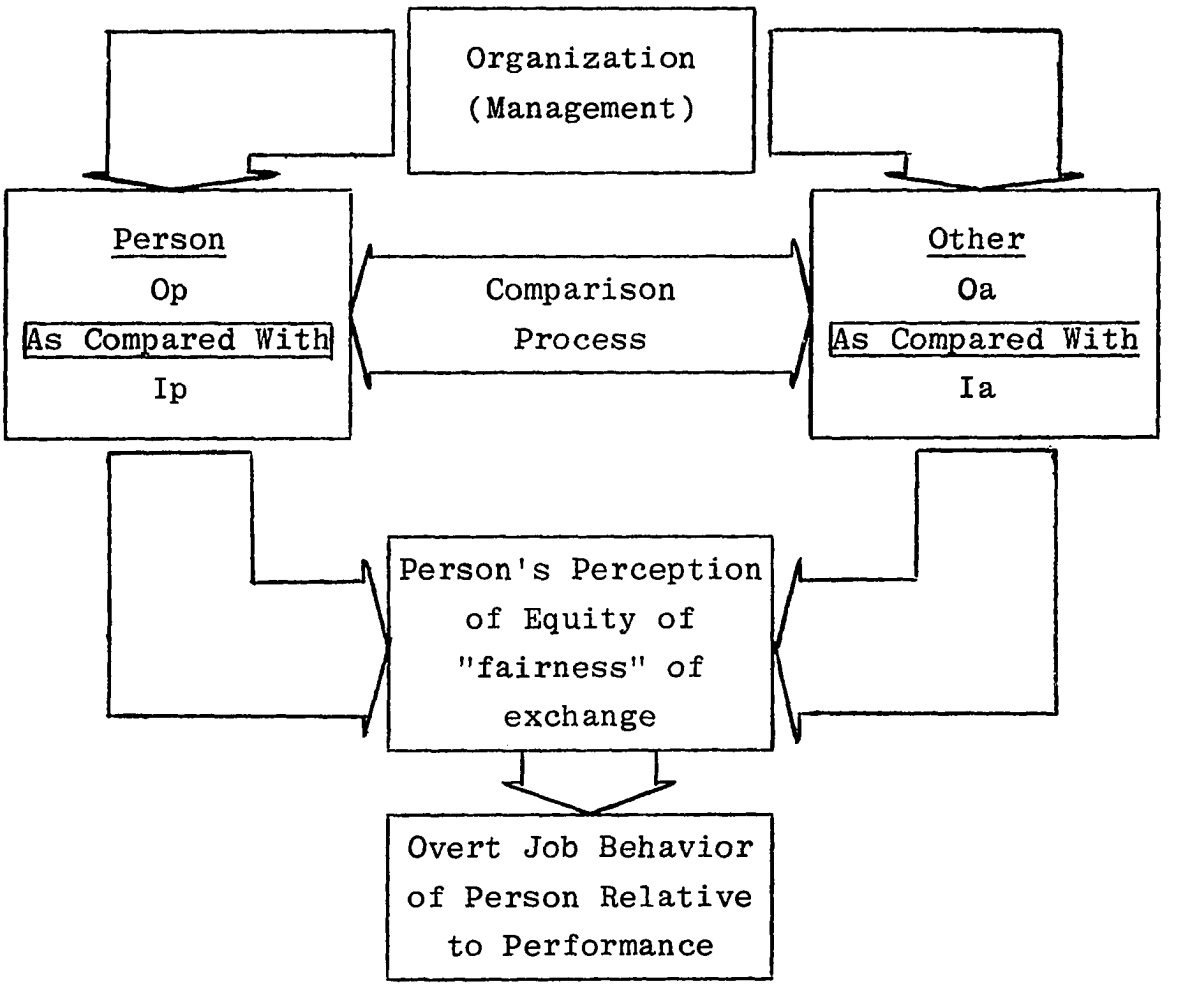


Figure 7. An Equity Model

relevance is that the equity model always provides for tension as a motivator (the "drive") to either maintain balance or restore balance should the balance state be disturbed. A side benefit from such an assumption is that the equity model provides a conceptual format for analyzing normal job behavior as well as abnormal behavior.

As mentioned earlier the process of the equity model was the least understood part of the theory. The comparison process between Person and Other is a unique, probably situational, blend of economic and psychological characteristics inherent in the equity relationship. To better understand this relationship it seems the most productive starting point if a study of the exchange begins with the outcome to input ratio; and once this is more clearly understood, research should seek a greater understanding of the more complicated exchange between the organization, Person and Other. The following experimental procedures have been designed to examine more closely two variables in the outcome to input ratio. Pay (Person's outcome) as the independent variable is manipulation by the researcher (or management) to bring about a change in performance (Person's output), the dependent variable. As a response to present evolution of equity theory, performance is measured in terms of both quantitative (production) and quality. This examination is then couched in terms of both overpay and underpay conditions which hopefully will extend the meaningfulness of the inquiry. Measures of job satisfaction are also obtained in an attempt to identify other possibly existing variables that may be impacting on the exchange relationship between performance and pay. Restated in a simple fashion the research design intends to investigate the following relationships:

PERFORMANCE, ATTITUDE - f(PAY)

CHAPTER III

EXPERIMENTAL METHODOLOGY

Chapter I described what this study intended to examine. Chapter II examined what has been done relative to equity theory as viewed by Adams and selected others. Chapter III describes the methodology of this study and how it was used. The results and conclusions are presented in the final two chapters.

The research design of this study is based on the theoretical foundation and empirical findings discussed in the previous chapter and is offered as a viable effort to extend Adams' theory of inequity. This experimental design was used to control an empirical field study involving white collar employees of a medium-sized manufacturing firm in Oklahoma City, Oklahoma.

Chapter III is divided into four sections: first, a brief statement of the variables involved and the conditions of experimental intervention is followed by an overview of the complete experiment; the second section is a description of the employees, their work environment and the tasks they perform; the third section details the procedures used in collecting data; and the hypotheses to be tested are stated in the final section. A major hypothesis and related minor hypotheses are stated for Trials 2, 3, 4, and 5.

Section 1: Variables Examined and Intervention Conditions

The variable/sets involved in this study are pay, job satisfaction and performance all placed within the framework of equity theory. Specifically the design tests:

1. Moderating effect of pay on performance,
2. Moderating effect of pay on job satisfaction,
3. The predictive capability of equity theory as it relates to the pay, performance and job satisfaction relationships.

Conditions of experimental intervention consisted of:

1. Hourly pay will remain the same for one experimental group (E_1) and the control group (C_1);
2. Hourly pay will be altered for one experimental group (E_2);
3. Undercompensation as induced by experimental conditions for experimental group E_1;
4. Overcompensation as induced by experimental conditions for experimental group E_2; and
5. Moderating effects of pay differientation in a "normal" work environment.

The research design can be best described as consisting of seven sequential steps.

Step 1

The first step consisted of describing the study and taking Pretrial measures of performance and attitude for later comparative purposes. All eligible employees were given a briefing about the study and were invited to participate. (See Appendix E for a transcript of the explanation offered during the briefing conference.) Those who chose to participate in the study were asked to complete the demographic questionnaire (See Appendix A) and the Job Description Index (JDI) (See Appendix A) and return them to us prior to leaving the conference.[1] Performance measures were taken for the four hour period prior to the meeting.

Step 2

Step 2 represented the first of five trials that were conducted. Performance measures were taken and a JDI was filled out by all employees at the end of the four hour trial.

Step 3

The third step of the experiment again involved taking performance and JDI measures. This step constituted Trial 2 and was the first trial where pay was altered for one of the two experimental groups. Pay was increased by ten percent per hour for four hours for experimental group E_2.

---

[1]So far as is known only one person who attended the briefing conference chose not to participate; six other employees were absent from work on the day of the briefing conference; thus, the fifty participants constitute ninety-five percent of all eligible employees.

Step 4

This step, or Trial 3, was the same as Trial 2 except pay was increased by thirty percent for the same experimental group E_2.

Step 5

Trial 4 was again the same as Trials 2 and 3 except the pay increase for experimental group E_2 amounted to fifteen percent.

Step 6

Trial 5 was the last trial and consisted only of taking performance and JDI measures. There was no alteration in the pay of any group.

Step 7

Step 7 consisted of taking performance and JDI measures as had been done in the Pretrial Sessions. Following this a debriefing conference was held during which all employees were told of the general intent of the experiment. Checks were distributed to all employees in the Control group (C_1) and the one experimental group (E_1) who had not received any augmentation of their pay during Trials 2, 3 and 4. This payment restored the equity of the situation for all participants.

The objective of the design was to examine the effects of changing pay on performance (overt job behavior) and job satisfaction. The goal of the design was to test the accuracy

of predictions made on the basis of Adams' (1963a, 1965) inequity theory in an industrial environment.

Section 2: Employee, Task and Work Environment Characteristics

The employees constituting the population for this study were employed in the Production Drafting and Data Processing Departments at STAR Manufacturing Company, Oklahoma City, Oklahoma.

Production Drafting Department Employees

The Production Drafting Department consists of fifty-nine persons, under the leadership of the Production Drafting Manager: forty-seven draftsmen, eight squad leaders, two secretaries and one Drafting Supervisor.[1] Only the secretaries are women.

The draftsmen are divided into eight squads, each headed by a squad leader who appears to be a hybrid firstline supervisor and lead man. The squad leader works in the section allocated to his squad. The productivity and quality of output appears to be the responsibility of the squad leader. His role is viewed as being crucial to the efficiency and effectiveness of the Production Drafting Department.

The draftsmen themselves are classified in four grades: Senior Draftsmen, Draftsmen, Junior Draftsmen and Checker.

---

[1]Please refer to Appendix B for Job Descriptions of draftsmen and supervisors.

The difference is in their usual work assignments. The following matrix is used to show the number of draftsmen by classification that made up the three groups in the experiment.

	Senior Draftsmen	Draftsmen	Junior Draftsmen	Checker	Total
Control Group (C_1)	0	8	1	3	12
Experimental Group (E_1)	1	9	3	1	14
Experimental Group (E_2)	3	7	1	3	14
Not Participating	2	3	2	0	7
Total	6	27	7	7	47

Figure 8. Occupational Classifications for Draftsmen

The Drafting Control Supervisor is responsible for scheduling and monitoring all drafting activities within Production Drafting. This also involves coordinating drafting activities with Sales Service, Material and Production Control and Engineering sections in the plant.

Drafting Department Facilities

The Drafting Department is located in a single room (98' x 69') which is partitioned into seven sections by dividers five feet high.[1] Each of these seven sections is the work area of a single squad, except for one large section which provides space for two squads. The administrative

[1]Refer to Appendix C for layouts of the drafting department and keypunch room.

offices are located across a hall from the drafting room and open out into the area. Each draftsman has two drafting tables, sits on a swivel stool between those tables, and has the most up-to-date equipment available for manual drafting. The drafting area is fully carpeted, well lighted, paneled and viewed by the experimenter as being nicely appointed. The dividers are also paneled except for the top eighteen inches which is glass.

Social Environment

Although this is not known for certain, most of the social interaction during actual working hours appears to take place within each squad. There is however a high degree of communication between squads during breaks, the lunch period and after work. A squad leader appears to take an active part in the normal social interaction processes. The Squad Leaders, like the Draftsmen, sit between two drafting tables. There is apparently no fixed routine for the superior-subordinate relationship between a Squad Leader and his draftsmen. In some squads the Squad Leader moves around from one drafting table to another (and between squads to confer with other Squad Leaders) while in others he remains at his drafting table and the Draftsmen come to him.

While it is certainly risky to speculate about climate in a given department it does seem that the Drafting Department could be characterized as having positive Squad Leader--Draftsmen relationships. Each squad does appear to function

as a cohesive group. Squads do compete with one another especially where "turn backs" (which are mistakes made by drafting personnel) are concerned. However, documentation of this characterization is beyond the scope of this study.

Data Processing Employees

Employees taking part in the experiment consisted of all ten Data Conversion Operators (i.e., Keypunchers) employed by STAR: six worked on the 8 am - 5 pm shift, and four on the 5 pm - 2 am shift. The age range of the all-female population was from twenty to thirty-eight. These women performed the key punching and verifying tasks normally associated with this job.

Facilities

The room where all of these women worked was fully enclosed, measured 31' x 16' and was decorated with paneling, carpet, accoustical tile on the upper portion of the walls and ceiling and was painted in pleasant colors. The keypunch machines were of the newer, noiseless design. In one corner of the room a low partition (4' 6" in height) separated the Data Conversion Supervisor's desk from the machines. The supervisor did not typically spend a great deal of time at her desk; instead she moved around the keypunch room or went to the data processing room across the hall from the keypunch room.

Social Environment

The social environment of the keypunch room appeared to be one of high information exchange and concern for each other; to an outsider, such as this experimenter, it seemed a rather pleasant work environment. The Data Conversion Supervisor confirmed this impression when she commented that "the girls get along very well, which is not usual in most keypunch departments."

Section 3: Research Design and Data Collecting Procedures

The experimental design (See Figure 9) represents the structural organization for this study. Seven primary components comprise the design as can be noted by reviewing Figure 9, and these are:

1. Time
2. Trials (T_1 - T_5)
3. Control Group (C_1)
4. Experimental Group 1 (E_1)
5. Experimental Group 2 (E_2)
6. Pretrial measures
7. Posttrial measures

Details about each of these components will inform the reader of the procedures by which the data were collected for this research. This chapter will conclude with comments about how employees were chosen for this study and about the payment which was made for their participation.

		TRIALS						
Trials Time (Date)		Pretrial 6/19	T-1 6/20	T-2 6/24	T-3 6/27	T-4 7/1	T-5 7/3	Posttrial 7/5
Measures:								
Performance Output		O_o	O_1	O_2	O_3	O_4	O_5	O_6
Performance Quality		Q_o	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6
Attitudes		A_o	A_1	A_2	A_3	A_4	A_5	A_6
Demographic Data		D_o						
Group		Employees Pay Change During Trials in Percent						
Control	C_1	0%	0%	0%	0%	0%	0%	0%
Experimental	E_1	0%	0%	0%	0%	0%	0%	0%
Experimental	E_2	0%	0%	10% (inc)	30% (inc)	15% (inc)	0%	0%

Figure 9. Overview of Structure for the Research Design

Time and Trials

After an extensive period of development involving STAR management personnel a mutual agreement was reached to initiate the experiment on June 18, 1974. The experiment was concluded on July 14, 1974, with a debriefing for all involved employees and STAR management. The following time schedule summarizes the principal events in conducting the experiment:

June 18: All Drafting Department Squad Leaders were given a thorough briefing as to what was planned for the experiment. The intent of the experiment, the questionnaires to be used and the Squad Leaders' role in measuring the performance of draftsmen were fully discussed.

June 19: At 4:30 p.m. an employee briefing was conducted in the main conference room at STAR Manufacturing for all drafting personnel. After a very general statement about the study, the mechanics of completing the two questionnaires were explained. This presentation was recorded and a transcription is reproduced in Appendix D. The demographic and JDI questionnaires were completed by all draftsmen attending the briefing, except the one who chose not to participate in the study.

A second employee briefing for all keypunch personnel began at 5:10 p.m. and had essentially the same content as the first. Personnel from both the first and second shifts attended this briefing; all keypunch personnel agreed to participate in the study.

June 20: Trial (T-1) was initiated for all Ss at 8:00 a.m. The length of all trials was four hours, beginning at 8:00 in the morning, and ending at 12:00 noon of the same day. The Ss did not know of these trials as such and only knew that they had been requested to complete a JDI just before noon. Nor did the Ss know that performance measures were being taken for that period. This secrecy was necessary to avoid possible contamination. The JDI was administered to the drafting personnel at 11:30 a.m. and to the keypunching personnel at 11:45 a.m. On the average it took five minutes for an individual employee to complete the JDI.

June 24: Trial (T-2) began at 8:00 a.m. with the distribution of a memorandum[1] to employees in the two experimental groups (E_1 and E_2). The memo was enclosed in an individually addressed envelope. The memorandum announcing that a temporary pay increase of ten percent per hour for four hours[2] would be given to certain named employees. The employees so named actually constituted experimental group E_2 and each of these persons had a check attached to his memo.

Beginning with T-2 there were some questions in the employees' minds about some receiving pay and some not. T-2 was the first trial to begin with an increase in pay (ten percent) which in terms of size of check amounted to $1.00 to

---

[1]A sample copy of this memorandum is presented in Appendix E.

[2]Or stated another way those selected employees would receive 110 percent pay for four hours.

$1.50. Both the Draftsmen and Data Conversion Operators were curious about the obvious discrimination relative to who got paid. One Draftsman in one of the squads receiving pay (in the E_2 group) asked why they received pay and some of the others did not. The experimenter was asked this question while passing out the JDIs and responded by indicating it was probably the result of some confusion somewhere and he would try to do something about it. A Data Conversion Operator, also a member of the E_2 group, asked why she had received pay and some of the other girls had not. The experimenter gave her the same answer as he had given the Draftsman.

As several Draftsmen were absent on June 19th (the employee briefing) they were not included in the experiment. Management however felt that they should be and as a result they were briefed, asked to fill out questionnaires, and made to feel a part of the experiment. Their data however had to be omitted prior to the analysis phase of the experiment.

JDI questionnaires were once again completed at 11:30 a.m. and 11:45.

June 27: Trial (T-3) followed the same routine as T-2 in every particular except the pay increase was thirty percent.

It is significant that after T-2 no Ss asked about the discrimination in pay. In fact the joking and general friendliness expressed in T-1 and T-2 by the Ss towards the experimenter noticeably declined from that point. The only question asked from that point on was how many times do we (the employees) have to fill out the attitude questionnaire.

The Ss also did not know that pay increases for E_2 and no pay increases for E_1 was prearranged during the experimental period. For that matter the Ss did not know they had been grouped as C_1, E_1 or E_2 groups.

July 1: Trial (T-4) was like T-2 and T-3 except that pay increase for the E_2 group amounted to fifteen percent.

July 3: Trial (T-5) was like T-1 in that only the performance measures were taken and JDI administered.

July 14: After all employees had completed the JDI for the Posttrial period, a debriefing session was scheduled during which all employees were informed as to what the study was about and what was hoped would be gained from the study. Checks were given to all employees in the control group (C_1) and the experimental group (E_1) to show appreciation for their participation in the study.

Control Group (C_1)

The assignment of participants to one of three groups was made on the basis and utilization of a table of random numbers. Draftsmen were assigned by squads to one of the three groups. The second shift Data Conversion Operators were assigned to Control Group (C_1) and the first shift Data Conversion Operators were assigned to the remaining two experimental groups on the basis of the random number table. The reason for all this was to avoid possible contamination. All the employees knew was that they were participating in a study on attitude being conducted by a teacher from the University

of Oklahoma, and that they would receive a small amount of pay for participating. The control group (C_1) was to provide a baseline for comparing the changes brought about in the experimental groups through experimental intervention. The C_1 consisted of twelve drafting personnel and four keypunch personnel. Drafting personnel in C_1 were told that because of the unusual number who chose to participate in the study that they would not be asked to fill out questionnaires until the very end of the experiment (that is for Trials 1-5). The C_1 was also told the discrimination was made on the basis of a "drawing" and explained as follows:[1]

> "Because of the unexpected participation in the study and because we only need assistance from about two-thirds of you we just picked some squads to participate by drawing from a hat. The squads not being asked to help will be involved in the final meeting and will receive your checks anyway."

For the keypunching personnel the above message was changed to include names rather than squads. No contact was made with the C_1 group after this message until the Posttrial period. However performance measures were taken for this group just as they were for both experimental groups.

Experimental Group 1 (E_1)

Measures of both performance and attitude were taken for E_1 group on a per trial basis. The pay for E_1 group

---

[1]This is a near reproduction of the announcement made by the experimenter; it is reasonable to suspect some variance in the explanation because it was repeated, after the original statement presented to the first squad, three times to two different drafting squads and the second shift in keypunching.

members did not change at any time during the study; however, this group was informed via memoranda that certain work associates (who constituted group E_2) were receiving additional pay at T-2, T-3 and T-4. Equity theory would predict, however, that the increase in pay for group E_2 would be perceived as an inequity by group E_1 and would, consequently, affect the performance of group E_1. The failure to receive the additional pay would be considered by E_1 as a form of undercompensation. Note that group E_1 did not actually have their pay decreased but were reacting to the pay increase awarded to group E_2 for Trials 2, 3 and 4. Actually decreasing pay for group E_1 was considered infeasible for two reasons: First, pay in most organizations is reduced only for compelling reasons; therefore a reduction in pay would create an unlikely situation. Secondly, STAR's management was unwilling to experience the potential problems that could be caused by reducing normal pay. Managers interviewed concerning this study expressed uneasiness about doing anything to "a man's pay," either decreasing or increasing it, but fewer problems were expected with a temporary increase in pay.

Experimental Group 2 (E_2)

Measures of both performance and attitude were taken for each trial. Pay was increased for each employee in E_2 on Trials 2, 3 and 4 by a stated percentage increase based on the hourly pay currently earned by that employee. The increased pay amounted to ten percent for Trial 2, thirty

percent for Trial 3, and fifteen percent for Trial 4. In Trial 2, when the incremental pay was ten percent, the checks ranged from $1.00 to $1.50 for the four-hour trial period. Pay was held "normal" for Trials 1 and 5. Equity theory would predict that performance for E_2 should increase for Trials 2, 3 and 4; attitudes should also be altered for Trials 2, 3, 4 and 5. This increase in pay represented overcompensation.

Pretrial Measures

Pretrial measures, like the posttrial measures, were incorporated into the design to add a greater element of control. The pretrial measures consisted of the demographic questionnaire, the JDI questionnaire and the measures of output and quality of performance.

Demographic Questionnaire: The Demographic Questionnaire was designed to gather basic data such as age, sex, education, etc., about each S in order to be able to construct a profile of the involved Ss and to aid in the analysis. Much of this information is admittedly available in personnel records, however by administering it at the onset of the study the experimenters were more assured of having current information. Also included in the demographic questionnaire was a section designed to assess the Ss perceived present financial situation. This was taken from Smith et al. (1965) and is termed the Retirement Descriptive Index (RDI). The complete RDI was not used and instead only the financial status portion was utilized.

Job Descriptive Index (JDI): The JDI was used to assess the attitude of each S prior to the study. It was subsequently included in all trials and posttrial measures. The JDI is a job satisfaction measure which uses a three-point scale. This simple but impressive instrument was developed by Patricia Smith and her associates at Cornell University and has been widely used in organizational research. A more comprehensive discussion of the JDI is found in Appendix A.

Performance Measures: Performance measures for the pretrial period were identical to those taken for all trials and the posttrial period. Performance was measured for all employees on the basis of quality and quantity of output. For drafting personnel performance measures were made on the basis of judgment by their respective Squad Leaders.

Performance measures for the Data Conversion Operators are more objective and, quite expectedly, readily quantified: they are key strokes per hour and number of errors. Keystroke is a common measure used to determine the amount of output for a given keypuncher within a given time period. Keystroke is the total number of times a Data Conversion Operator punches a character into a punch card. Quality was measured on the basis of the number of errors a Data Conversion Operator makes while keypunching. This error is identified through the verification process or during editing in the machine room. Verification errors are identified during the editing process.

Posttrial Measures

Posttrial measures were taken on all Ss after completion of the study. They were identical to the trial measures and consisted of the JDI questionnaire and the measures of output and quality of performance.

Beyond the foregoing comments on the primary components which comprise the experimental design, some remarks should be made about the selection of personnel for the study and the payments made to all participants.

Employee Sample

The sample involved in the experiment consisted of all but seven Production Drafting draftsmen and all Data Conversion Operators. Of the seven draftsmen not participating four were on a scheduled vacation and two were absent on the day of the initial briefing. One draftsman elected not to take part in the study. There were however seven draftsmen outside of Production Drafting who were not included in the experiment. Management would not authorize the participation of the seven because their work was chiefly developmental in character and they preferred not to bother them. All keypunch personnel were involved. The sample size by group was:

	Draftsmen	Data Conversion Operators	Totals/Group
Control Group (C_1)	12	4	16
Experimental Group 1 (E_1)	14	3	17
Experimental Group 2 (E_2)	14	3	17
Not Participating	7	-	7
Total	47	10	57

The sample consisted of ninety-five percent of all production draftsmen and one hundred percent of all keypunchers; or eighty-eight percent of the personnel employed in these two jobs.

One issue touched on earlier in Section 3 deserves special mention. The performance measures for keypunching have proven to be adequate relative to this experiment's design criteria. The nature of the drafting task required that a special performance measure system be devised. The drafting task has a great deal of inherent variability in terms of complexity and time requirements: no two jobs are alike. Detail work, or what the layman would call the drawing activity, is characterized by extremes relative to time and complexity. In the Drafting Department the Drafting Control Supervisor assigns a given project to a draftsman on the basis of his presumed skill. A Senior Draftsman is assigned the most complex projects, a Draftsman less complex projects and a Junior Draftsman the simpler projects. The Drafting Control Supervisor makes an initial determination of how long each project should take and although he is nearly accurate in his estimate there is some discrepancy between the Scheduler's estimate and the actual number of manhours used to complete the project. In addition Draftsmen do not engage in detail work (or what a layman might call "drawing") all the time. Part of their time is spent in calculating and organizing conceptually what must be done to produce a final set of drawings. Draftsmen also compute shipping lists which is

less time consuming than other forms of drafting work; but shipping lists, too, vary with respect to the time and effort required. Another measurement problem arises from the fact that a project may require days or weeks to complete; the Drafting Manager and Squad Leaders were convinced that it is next to impossible to accurately evaluate a draftsman's actual output during any four-hour span.

Because of all these complexities the experimenter was constrained to rely on the Squad Leader's assessment of each employee's performance for each four-hour trial period. A standardized form was devised and used for this purpose (See Appendix F). A brief training period was held prior to the experiment to show the Squad Leaders how to record their assessments on this form. Based on the differing responses by a Squad Leader for a given employee from one trial to the next there was some meaning in their measurement. Should the performance measures for E_1 and E_2 have not varied then there would be some grounds for doubting the validity of this method of measuring performance. The validity of the measure was in large part due to the fact that a Squad Leader was evaluating a specific employee on the basis of that employee's performance a repeated number of times. There was no comparison of one employee to another. It is assumed the Squad Leader's perception of what a given employee's level of performance should be remained constant for the twenty-five day period of the experiment. This reasoning also seems applicable in a case where a Squad Leader may like or dislike a given employee.

Payment to Participants

Finally, some additional comments are in order about the payments made to all employees who participated in this experiment. Pay was given to the employees of the E_2 group at the beginning of T-2, T-3 and T-4 (as indicated above). The remainder of the employees (that is those in the C_1 and E_1 groups) received their pay in one check during the final information meeting. Pay was given in the form of a check from the University of Oklahoma prepared by the Bursar's Office.

Two reasons may be advanced for giving pay to everyone: first, management insisted that everyone be compensated otherwise "hard feelings" might result; and, second, the experimenter did not want the employees in Groups E_1 and C_1 to feel they had been poorly treated by the University. From the onset STAR management made pay for everyone a condition for allowing the experimenters to conduct their study. Their rationale was based on the relevant idea (which is especially relevant to the nature of this study) that "you don't mess around with a man's pay." In selling STAR management on the idea of the experimenter conducting this particular study the manipulation of pay was an obvious problem.

Section 4: Hypotheses Statement

The following is a brief statement of the five major hypotheses tested by this experiment. These hypotheses are

designed to test, or to extend, Adams' theory of inequity.[1] Each major hypothesis is related to a specific trial in the experiment and four of these hypotheses have several minor hypotheses associated with them. In Chapter IV each hypothesis will be re-presented and discussed in detail relative to the findings of this study.

Hypothesis 1 (Related to Trial 2):

A ten percent increase in the normal hourly pay for E_2 will result in perceptions of inequity for groups E_1 and E_2.

1a--A ten percent increase in pay for E_2 will not result in a significant moderation in output of performance for E_2.

1b--A ten percent increase in pay for E_2 will result in a moderate increase in quality of performance for E_2.

1c--A ten percent increase in pay for E_2 will result in a moderation of employee attitudes for E_1 and E_2.

Hypothesis 2 (Related to Trial 3):

A thirty percent increase in the normal hourly pay for E_2 will result in measurable differences among all groups as compared to their respective Trial 2 measures of performance and attitudes.

2a--A thirty percent increase in pay for E_2 will result in an increase in quality of performance for E_2.

2b--A thirty percent increase in pay for E_2 will result in a measurable decrease in quality of performance

---

[1]Specifically these hypotheses are based on the predictions as presented in Adams (1963a) and Adams (1965).

and an increase in output of performance for E_1.

2c--A thirty percent increase in pay for E_2 will moderate attitudes for E_1 and E_2.

Hypothesis 3 (Related to Trial 4):

A fifteen percent increase in the normal hourly pay for E_2 will result in measurable differences among all groups as compared to their respective Pretrial measures of performance and attitudes.

3a--A fifteen percent increase in pay for E_2 will result in a moderate increase in both quality and output of performance for E_2.

3b--A fifteen percent increase in pay for E_2 will result in an output of performance for E_1 that is greater than the group's output of performance in T-1 but less than its output of performance in T-3.

3c--A fifteen percent increase in pay for E_2 will result in a quality of performance for E_1 that is greater than the quality of performance in T-3 but less than the quality of performance in T-1.

3d--A fifteen percent increase in pay will moderate attitudes for E_1 and E_2.

Hypothesis 4 (Related to Trial 5):

A restoration of pay to Pretrial levels for E_2 will stabilize performance and attitudes to pre-experimental levels for E_1 and E_2.

4a--A restoration of pay to Pretrial levels for E_2 will decrease quality of performance to pre-experimental levels for E_1 and E_2.

4b--A restoration of pay to Pretrial levels for E_2 will decrease output performance for E_1.

4c--A restoration of pay to Pretrial levels for E_2 will result in a modification of attitudes for E_1 and E_2 as compared with their respective measures in T-4.

Hypothesis 5 (Related to the Posttrial Period):

Performance levels for the Posttrial period will be the same as the Pretrial performance measures for all groups.

With this presentation of the research design, the findings of the study can now be presented.[1]

---

[1]The hypotheses in this study explicitly tests those predictions made by Adams relative to what will happen to quality and quantity performance when pay is altered. Adams' inequity theory holds that when pay is increased for the E_2 group that quantity performance for E_2 should decrease and quality performance should increase. The opposite should occur for the E_1 group when the E_2 group's pay is increased.

CHAPTER IV

RESEARCH RESULTS

Section 1

The purpose of Section 1 is to present a demographic profile of the population involved in this study. The organization for this section was based on the demographic questionnaire which is included in Appendix A. The data presented in this section were analyzed through a conventional examination utilizing measures of central tendency, frequency counts and percentages.

The average age of the population in this study is 25.7 years with the majority (38) being under 28 years old. The age range was from 20 to 42 years. Forty males and 10 females made up the 50 people participating in the study. The average length of employment at STAR was 2.1 years with a mode of one year. The median term of employment at STAR was 1.3. The average length of tenure in present occupation was 1.9 with 66 percent of the population working at the same occupation at which they were employed. Fifty-four percent had not worked at their present occupation prior to their employment with STAR. Relative to training 58 percent had received training in high school, 86 percent training in vo-tech or private tech schools, 2 percent had some training in the armed forces,

2 percent had on-the-job training at STAR and 80 percent experienced some on-the-job training while employed by firms other than STAR. Seventy-two percent of the population were natives of Oklahoma, with the average number of years in the Oklahoma City area for all employees being 10.8. Only one person in the population had not completed high school, 21 attended college, 7 completed a junior college program and 7 graduated from a four year college.

Relative to their individually perceived financial situation the average score was 20.86 with a median of 18.67 and a mode of 18.01. The standard deviation was 9.05. The mean score of 20.86 is less than a nation wide average of 30.96 with a standard deviation of 11.06.[1] Thirty-five of 50 Ss scored below 22 on the financial situation question, and 48 scored below 30. This indicates the self-perceived financial situation of this population is somewhat lower than normal. This finding is further substantiated by the JDI Pay Scale which shows a 29.90 average with a standard deviation of 14.53. The grand mean for all trials from the Pay Scale of the JDI was 12.26 with a range from 11.86 on the Pretrial to 14.00 on Trial 5. It should be noted that other JDI scales as well as the total JDI score were lower than those scores

---

[1]This comparison should be approached with caution as the measurement properties incorporated in the average of 30.96 may lack adequate documentation, also the mean of 30.96 was computed on a male retiree population. See Smith, Patricia Cain, Lorne M. Kendall, Charles L. Hulin, The Measurement of Satisfaction in Work and Retirement, Rand McNally & Company, Chicago, 1969, p. 82.

derived from male populations in 21 plants located across the United States. The grand mean for all trials for the Work Scale was 30.97 as compared to a mean of 36.57 for the nation wide sample. The Supervision Scale was 25.98 as compared to the norm of 41.10. For Promotion the grand mean was 14.10 compared to a norm of 22.06 and for Co-workers it was 23.78 as compared to a normal mean of 43.49. The total JDI, which is the 5 scales added, was 109.35 for the study population as compared to 173.12. The job satisfaction scores taken as a whole or as separate occupational groups indicate that Draftsmen and Data Conversion Operators are less satisfied with their present work situation than the average worker.

To summarize this profile the population involved in this study consisted of workers who were mostly under 28 years, predominantly male, of short tenure with the organization and were natives of Oklahoma and the Oklahoma City area. In addition the population lacked extensive formal education, which is defined here as successfully completing a four year college program, had not experienced much on-the-job training, but who had received most of their training in vo-tech or private vocational schools. The population as a whole was dissatisfied with their work, supervision, pay, promotion possibilities and co-workers as compared to the national sample.

Section 2

The purpose of Section 2 is to present specific research results for each of the major five hypotheses that have provided the parameters for this study. For greater specificity each major hypothesis was restated in the form of several minor hypotheses. The organization of Section 2 is constructed around each of these minor hypotheses. Generally the format is one where first the major hypothesis is stated followed by a number of related minor hypotheses. After each minor hypothesis is a table which presents group mean scores and F ratios. The principal statistics used to examine the hypotheses in this section are means, Analysis of Variance (ANOVA) and Multi-analysis of Variance (MANOVA).

Discussion is minimized in this section and is confined to the specific statistical finding under examination. Elaboration and interpretation of such findings are reserved for Chapter V.

A special comment is warranted relative to how the data will be presented in this section. While performance and attitude measures were taken for Data Conversion Operators and Draftsmen as a single population only the data for Draftsmen are presented.[1] These numerical scores could not be combined

---

[1]Moreover the nature of tasks for Data Conversion Operators introduced extreme variance with a resulting excessive standard deviation about the mean. This feature, when combined with the data resulting from Draftsmen performance measures, would have made any meaningful statistical interpretation impossible.

for statistical analysis without introducing an excessive amount of variance thereby confounding possible significant results. The presentation of the statistical analysis in Section 2 is confined exclusively to Draftsmen so that a clearer picture is provided for those contemplating future research of this nature. The excessive variance for the Data Conversion Operators resulted from an inadequate sample size ($n = 3$ for the E_1 and E_2 groups) and differing tasks performed during a given trial period. Clearly the problem could have been overcome with a larger Data Conversion Operator population and with a greater standardization of the tasks.

In Section 2 the results are presented sequentially for each hypothesis: first stating the hypothesis, then presenting the statistical data, and concluding with brief comments on the findings. While that method of presentation provides the reader with the necessary information to evaluate an individual hypothesis statement it may not facilitate his acquiring an overall view of the developing trends for the seven trials. The following graphs presented as Figures 10 through 12 will aid in this. The plot points in the graph are group mean scores for Draftsmen for all trials. It should also be noted that a 3 x 7 ANOVA for all three groups and a 2 x 7 ANOVA for E_1 and E_2 groups did not indicate a statistical significance for quality of performance or for the total JDI.

Special attention should be given to the method of reporting in Section 2. The first part of Section 2 contains three graphs that were plotted on the basis of group mean scores. These group means are for each trial and each of the three respective groups: group E_1, E_2 and C_1. Each plot mark in Figures 10, 11 and 12 is for a particular trial and represents the average score for quantity, quality or total JDI. The purpose of these figures is to give the reader an overview prior to reading the second part of Section 2.

The tables in Section 2 represent the data for a given hypothesis and consist of group mean scores (the same as those group mean scores in Figures 10, 11 and 12 except they are directly related to a specific hypothesis) and F ratios. The F ratios represent a method of comparing group mean scores. A significant F ratio is one that demonstrates an effect of an independent variable on the dependent variable. The independent variable in this study is pay and the dependent variables are quality performance, quantity performance and attitude. The lack of a significant F ratio indicates there was no difference between group mean scores, thereby demonstrating no impact of the independent variable on the dependent variable. F ratios are reported for between trials and between groups measures. The hypotheses are supported or not supported on the basis of the between trials F ratios.

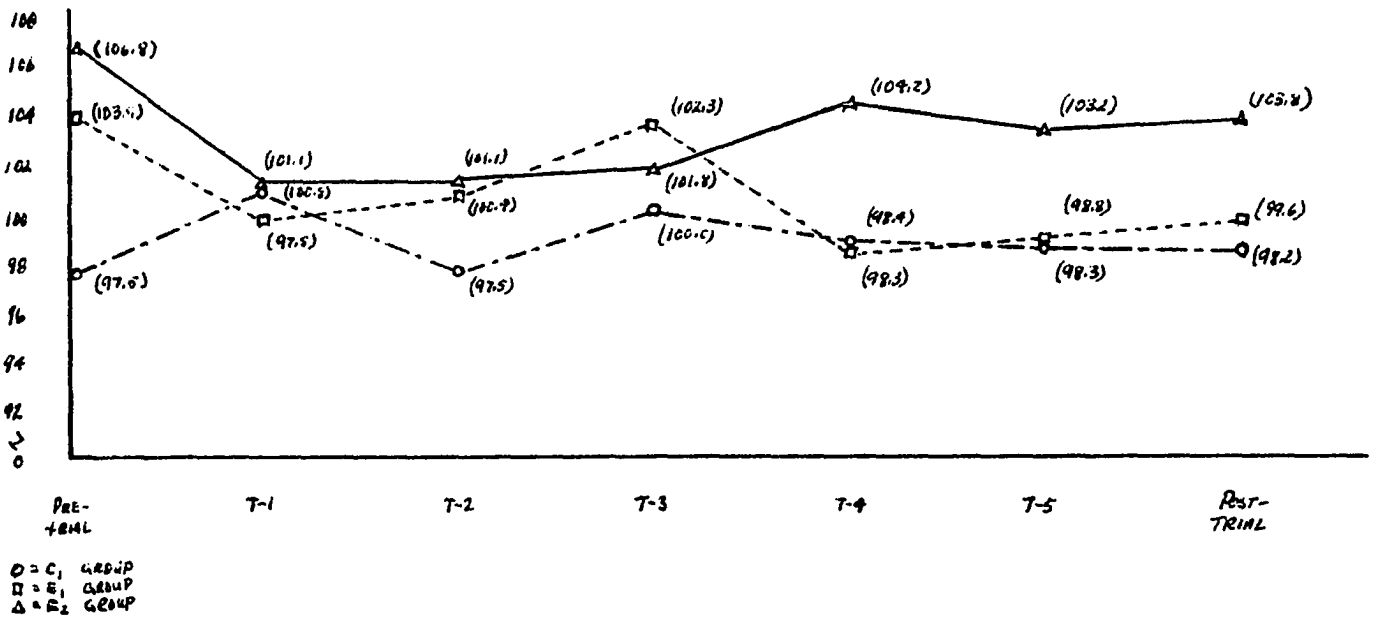


Figure 10. Quality Group Mean Scores for All Drafting Groups for All Trials

Examination of the trend lines indicate a certain dynamic character for each group on the ordinate scale. The C_1 group begins with a 97.5 and although it changes as much as 3.3 between some successive trials, ends in the Posttrial period on 98.2. The E_1 group begins in the Pretrial with a group mean score of 103.9 and generally decreases to a 99.6 in the concluding Posttrial period. During T-3 there was an increase from 100.4 in T-2 to 102.3 but after this continued its downward trend. Group E_2 begins in the Pretrial period with 106.8 which was the highest level of quality for any group and begins a downward trend to T-3. At T-4 however the E_2 group average increases to 104.2 and continues on to a 103.8 in the Posttrial period. There was considerable

interaction between groups as demonstrated by the crossing trend lines. Although C_1 was the most stable in nature it could also be considered somewhat dynamic. All groups concluded the series of trials in the same rank order as they started with in the Pretrial period.

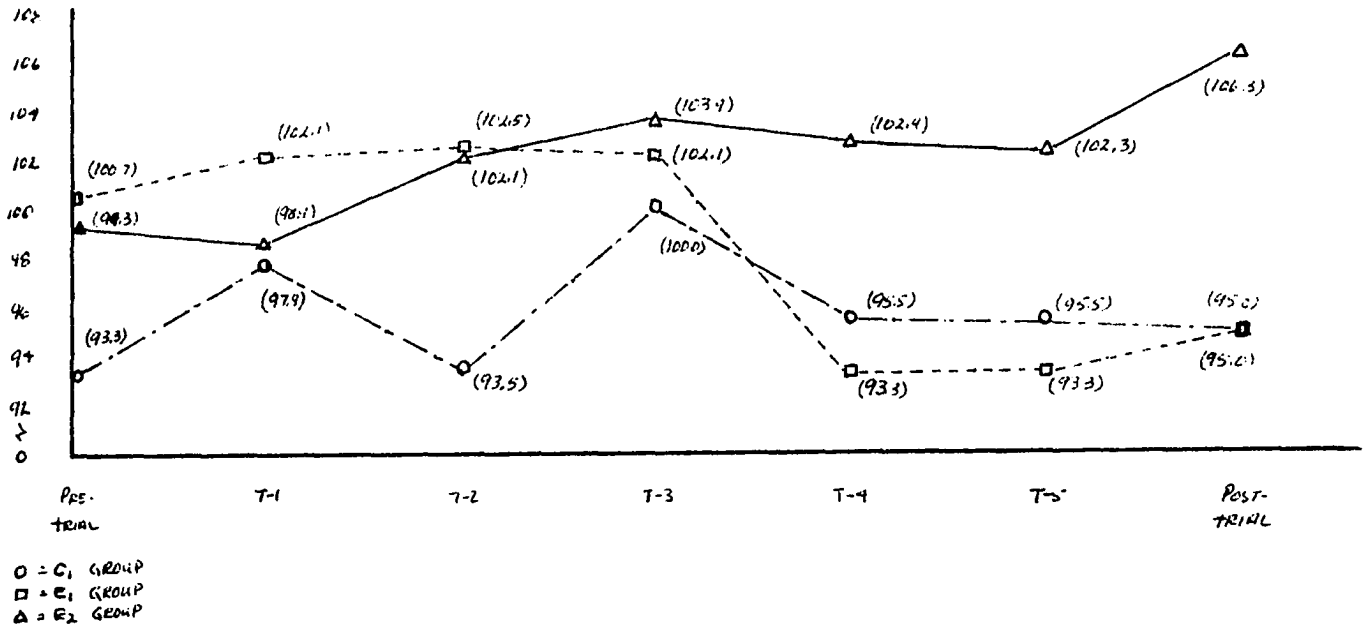


Figure 11. Quantity Group Mean Scores for All Drafting Groups for All Trials

The C_1 group quantity mean score begins with 93.3, the lowest of the three means, and ends in the Posttrial with a 95.0. C_1 movement on the ordinate axis is dynamic for a control group and does not exhibit stability until T-4. The trend line for the E_1 begins with a 100.7 group mean and after increasing to a 102.5 in T-2, decreases to 95.0 in the Posttrial; this decrease was not gradual, having taken place in the period between T-3 and T-4. Group E_2 began in the Pretrial

period with a quantity group mean of 99.3 and continued with a gradual increase to 106.3 in the Posttrial period. A minor decrease in the E_2 trend line did occur for T-4 and T-5. Interaction between trend lines did occur for 3 of the 7 trials.

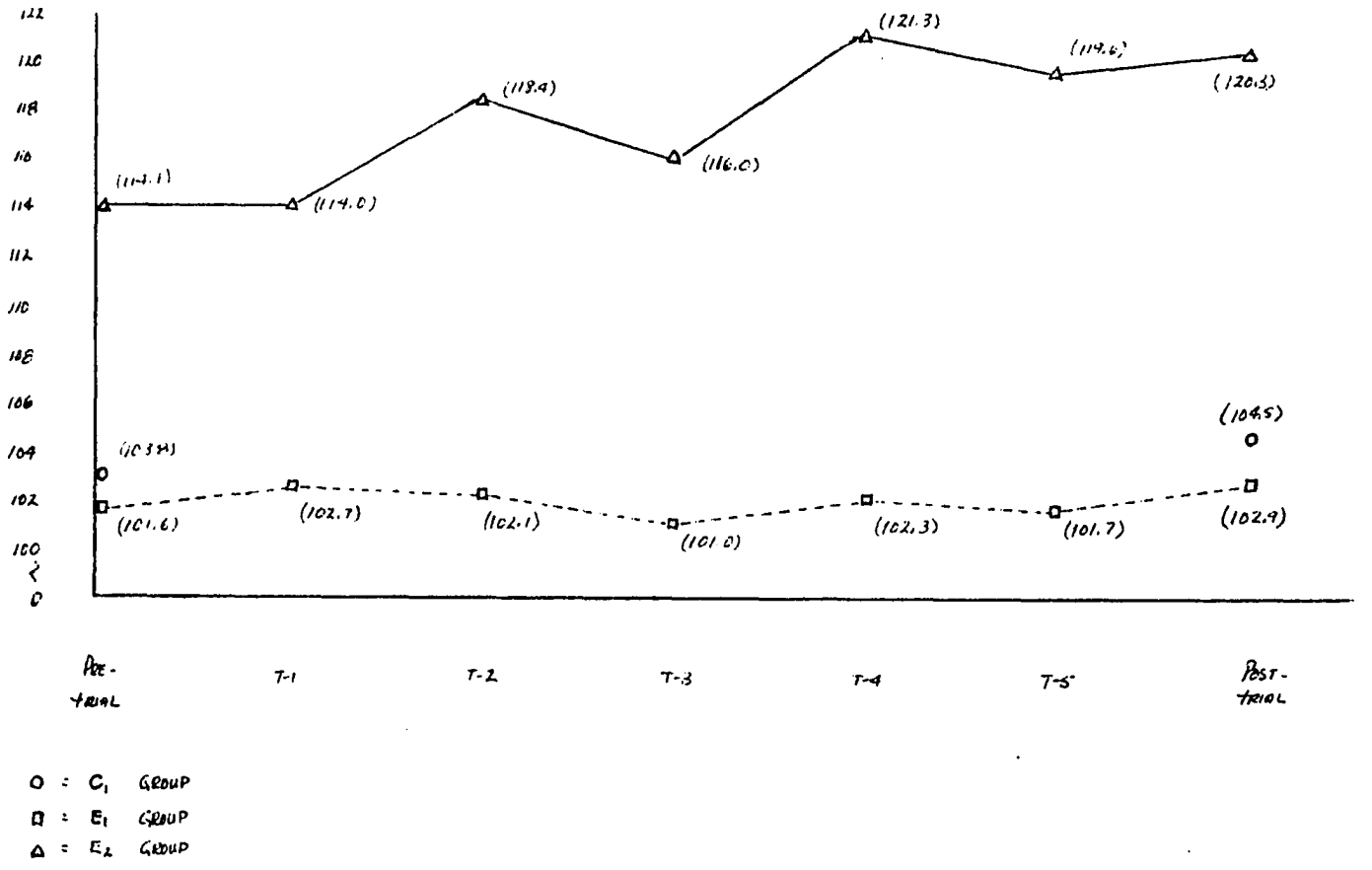


Figure 12. Total JDI Group Mean Scores for Drafting Groups for All Trials

The total JDI group mean trend line for C_1 began in the Pretrial period with a 103.8 and ended with 104.5. There were no scores for T-1 through T-5 as C_1 was the control group

and did not take the JDI for those trials. The E_1 group was stable over the duration of all trials indicating a little alteration in job attitude. Group E_2 began with a group mean of 114.1 and continued to generally increase over the span of trials ending with a score of 120.3. There was no interaction of trend lines for any groups during the 7 trial periods.

Figures 10 through 12 provided an overview of the behavior for the three groups over the time period and encompass the 7 trials of the study as related to each of the three dependent variables. There are indications of movement on the vertical axis for groups E_1 and E_2 especially for quality and quantity measures. There is also some movement for C_1 for these measures. Only E_2 demonstrated much change over trials for the total JDI scores which was in the nature of an increasing function.

The remainder of Section 2 consists of presenting each hypothesis with its related data. According to commonly accepted protocol in the ANOVA for analysis should an overall test of significance be lacking there is no need to continue analysis. However there are several mediating reasons for continuing the analysis even though the groups by trials ANOVA for quality performance and for total JDI were not significant. The F ratio for the groups by trials for quantity performance was significant at the .05 level indicating a need for more detailed analysis. Another reason for continuing with the analysis is that a purpose of this research is to prove or disprove, through field research, Adams' theory of inequity.

This purpose presents substantial obligation to report the results and to present such data and interpretation as might prove helpful to others.

Pretrial and Trial 1 Periods

As mentioned earlier there were no hypotheses stated for the Pretrial period or T-1. However as data were collected and it is an integral part of the study, the results are presented for comparison with data from later periods.

TABLE 1[1]

Quantity of Group Performance in the Pretrial Period for Draftsmen

Groups	Group Mean Scores
C_1	93.3
E_1	100.7
E_2	99.3
F Ratio (Between Groups)	1.837

The group mean quantity scores for Draftsmen do not indicate any significant differences. The group mean scores for Draftsmen indicate some difference, however the F ratio[2]

[1]The design for the tables is that recommended by Mary Eleanor Spear in her publication Practical Charting Techniques, McGraw-Hill Book Company, New York, 1969.

[2]Significant F ratios will be identified with a single or double asterisk mark. A single asterisk indicates significance at the .05 level and a double asterisk indicates significance at the .01 level.

of 1.837 is not significant which demonstrates considerable variance between groups to the point that no meaningful difference can be said to exist.

TABLE 2

Quality of Group Performance in the Pretrial Period for Draftsmen

Groups	Group Mean Scores
C_1	97.5
E_1	103.9
E_2	106.8
F Ratio (Between Groups)	1.574

Quality mean scores for Draftsmen indicate that the Pretrial quality performances of all groups are similar. The F ratio for Draftsmen is not significant indicating the between group means are not different.

TABLE 3

Total JDI Scores of Group Performance in the Pretrial Period for Draftsmen

Groups	Group Mean Scores
C_1	103.8
E_1	101.6
E_2	114.1
F Ratio (Between Groups)	2.906

Pretrial total[1] group mean scores for the Job Descriptive Index (JDI) indicate no difference between group means. Pretrial JDI means for Draftsmen do indicate some differences between group means. This is however not supported by the F ratio of 2.906.

TABLE 4

Quantity of Group Performance in the Trial 1 Period for Draftsmen

Groups	Group Mean Scores
C_1	97.9
E_1	102.1
E_2	98.9
F Ratio (Between Groups)	.834

There are no significant differences between the quantity scores for Draftsmen. On the surface there appears to be a slight difference between group mean scores for Draftsmen, but the low F ratio of .834 indicates no statistically meaningful difference. The cause of this is the excessive standard deviation about the mean within groups.

[1]The "total" represents a summation of the scores of the five scales of the JDI: work, supervision, pay, promotion and co-workers.

TABLE 5

Quality of Group Performance in the Trial 1 Period for Draftsmen

Groups	Group Mean Scores
C_1	100.8
E_1	99.6
E_2	101.1
F Ratio (Between Groups)	.443

Trial 1 quality mean scores between drafting groups do not demonstrate any significant differences.

TABLE 6

Total JDI Scores of Group Performance in the Trial 1 Period for Draftsmen

Groups	Group Mean Scores
E_1	102.7
E_2	114.0
F Ratio (Between Groups)	3.313

The mean group scores for Draftsmen indicated that job attitudes per the total JDI scores was greater for the E_2 at the beginning of the series of 5 trials. However the F ratio of 3.313 is not significant at the commonly accepted .05 level therefore it is concluded that no meaningful differences existed between drafting groups.

In summary the Pretrial and Trial 1 scores do not exhibit any meaningful differences between drafting groups. The variance existing within groups appears to be considerable for both periods of measurement.

Beginning with Trial 2 (T-2) pay as the independent variable was altered by increasing it 10 percent for E_2. According to Adams' formulation of equity theory this should produce certain prescribed changes in the quality and quantity measures for the two experimental groups. The remainder of this Section is organized on the basis of the hypothesis associated with the successive Trial periods; for each hypothesis is presented a table of relevant statistical findings, together with some remarks relating to these findings.

Trial 2 Period

Hypothesis 1 (Trial 2)

A 10 percent increase in the normal hourly pay for E_2 will result in perceptions of inequity for groups E_1 and E_2.

Minor Hypothesis 1a: A 10 percent increase in pay for E_2 will not result in a significant moderation in output of performance for E_2 relative to E_1.[1]

---

[1]The phrase "relative to E_1" (or "relative to E_2" in other instances) represents an addition to the original hypothesis statement as presented in Chapter III. These changes are made for clarification purposes. This practice will continue for later hypotheses according to need.

TABLE 7

Quantity of Group Performance in the Trial 2 Period for Draftsmen

Groups	Group Mean Scores (T-1)	T-2	F Ratios (Between Trials)
C_1	(97.9)	93.6	1.593
E_1	(102.1)	102.5	.024
E_2	(98.9)	102.1	.942
F Ratio (Between Groups)		4.311*	

There was little change in quantity performance for all drafting groups in T-2 as compared to T-1 quantity measures for E_2. The F ratio for Draftsmen of 4.311 is significant at the .05 level indicating the existence of a possible difference between groups. The average quantity performance for the E_2 drafting group increased by 3.21 to T-2 as compared to T-1 and is not viewed as a significant moderation in output. Hypothesis 1a is not supported.

Minor Hypothesis 1b: A 10 percent increase in pay for E_2 will result in a moderate increase in quality of performance for E_2 relative to E_1.

TABLE 8

Quality of Group Performance in the Trial 2 Period for Draftsmen

Groups	Group Mean Scores (T-1)	T-2	F Ratios (Between Trials)
C_1	(100.8)	97.5	6.766*
E_1	(99.6)	100.4	.114
E_2	(101.1)	101.1	0.0
F Ratio (Between Groups)		1.509	

There was no change in the quality of performance for Draftsmen from T-1 to T-2. None of the F ratios are significant except the one between trials for C_1. On the basis of these findings Hypothesis 1b is not supported.

Minor Hypothesis 1c: A 10 percent increase in pay for E_2 will result in a moderation of employee attitudes for E_1 and E_2 relative to attitudes on T-1.

TABLE 9

Total JDI Scores of Group Performance in the Trial 2 Period for Draftsmen

Groups	Group Mean Scores (T-1)	T-2	F Ratios (Between Trials)
E_1	(102.7)	102.1	.010
E_2	(114.0)	118.4	.696
F Ratio (Between Groups)		8.952**	

There were moderations of the total JDI mean scores for E_2 Draftsmen with the E_2 occupational group experiencing a slight increase in job satisfaction. The F ratio for Draftsmen of 8.952 is significant at the .01 level indicating a considerable difference between drafting groups. Inasmuch job satisfaction was not moderated from T-1 to T-2; Hypothesis 1c is not supported.

Trial 2 was the first trial where inequity was introduced in the experiment by increasing the pay for E_2 by 10 percent (that is 110 percent of normal pay for the 4 hour trial period). Hypothesis 1a was supported in that there was not a significant increase in quantity performance for E_2; Hypothesis 1b, which was concerned with quality performance for E_2, was not supported; and Hypothesis 1c was not supported as the total JDI group scores were not moderated relative to T-1.

Trial 3 Period

Hypothesis 2 (Trial 3)

A 30 percent increase in normal hourly pay for E_2 will result in measurable differences among all groups as compared to their respective Trial 2 measures of performance and attitudes.

Minor Hypothesis 2a: A thirty percent increase in pay for E_2 will result in an increase in quality of performance for E_2 relative to E_1.

TABLE 10

Quality of Group Performance in
the Trial 3 Period for Draftsmen

Groups	Group Mean Scores (T-2)	T-3	F Ratios (Between Trials)
C_1	(97.5)	100.0	2.587
E_1	(100.4)	102.3	.427
E_2	(101.1)	101.8	.237
F Ratio (Between Groups)		1.352	

Hypothesis 2a for T-3 is not supported for Draftsmen as based on the statistical results in Table 10. The group mean scores for E_2 Draftsmen showed a .7 increase over T-2 with an insignificant between group F ratio of 1.352. The F ratios for between trials were not significant.

Minor Hypothesis 2b: A 30 percent increase in pay for E_2 will result in a measurable decrease in quality of performance and an increase in output of performance for E_1.[1]

[1]Please note that for Hypothesis 2b Tables 10 and 11 are required as this hypothesis refers to both quality and quantity measures.

TABLE 11

Quantity of Group Performance in the Trial 3 Period for Draftsmen

Groups	Group Mean Scores (T-2)	T-3	F Ratios (Between Trials)
C_1	(93.6)	100.0	.899
E_1	(102.5)	102.3	.958
E_2	(102.1)	103.9	.506
F Ratio (Between Groups)		1.640	

Based on the group mean scores and the F ratios in Tables 10 and 11, Hypothesis 2b is not supported. The group means actually tend to move in the wrong direction for both the E_1 and E_2 groups. However the change from T-2 to T-3 is minor as indicated by the low between trial F ratio.

Minor Hypothesis 2c: A 30 percent increase in pay for E_2 will moderate attitudes for E_1 and E_2.

TABLE 12

Total JDI Scores of Group Performance in the Trial 3 Period for Draftsmen

Groups	Group Mean Scores (T-2)	T-3	F Ratios (Between Trials)
E_1	(102.1)	101.0	.027
E_2	(118.4)	116.0	.171
F Ratio (Between Groups)		4.954*	

The group mean for total JDI scores slightly decreased for both drafting groups as compared to T-2. The between groups F ratio for Draftsmen was significant at the .05 level however the between trials F ratios were not significant. As attitude was not moderated for Hypothesis 2c it is not supported.

Trial 4 Period

Hypothesis 3 (Trial 4)

A 15 percent increase in normal hourly pay for E_2 will result in measurable differences among all groups as compared to their respective Pretrial measure of performance and attitudes.

Minor Hypothesis 3a: A 15 percent increase in pay for E_2 will result in a moderate increase in both quality and output of performance for E_2.

TABLE 13

Quantity of Group Performance in the Trial 4 Period for Draftsmen

Groups	Quantity Group Mean Scores (Pretrial)	T-4	F Ratios (Between Trials)
C_1	(93.3)	95.5	.379
E_1	(100.7)	93.3	1.020
E_2	(99.3)	102.9	.301
F Ratios (Between Groups)		2.144	

TABLE 14

Quality of Group Performance in the Trial 4 Period for Draftsman

Groups	Quality Group Mean Scores (Pretrial)	T-4	F Ratios (Between Trials)
C_1	(97.5)	98.4	.126
E_1	(103.9)	98.3	.640
E_2	(106.8)	104.2	.286
F Ratios (Between Groups)		2.538	

The quantity group mean score increased for E_2 Draftsmen. Quality performance for E_2 Draftsmen decreased. Hypothesis 3a is not supported as indicated by all F ratios.

Minor Hypothesis 3b: A 15 percent increase in pay for E_2 will result in an output of performance for E_1 that is greater than the group's output of performance in T-1 but less than its output of performance in T-3.

TABLE 15

Summary of Quantity of Group Performance in the T-1, T-3, and T-4 Periods for Draftsmen

Trials	Group Mean Scores	F Ratios (Between Trials)
T-1	102.1	
T-3	102.3	.128
T-4	93.3	1.457

Quantity performance for Draftsmen is virtually unchanged in T-3 but drops off to 93.3 in T-4. There is marginal support for Hypothesis 3b for Draftsmen as based on the group mean. Hypothesis 3b is not supported.

Minor Hypothesis 3c: A 15 percent increase in pay for E_2 will result in a quality of performance for E_1 that is greater than the quality of performance in T-3 but less than the quality of performance in T-1.

TABLE 16

Summary of Quality of Group Performance in the T-1, T-3 and T-4 Periods for Draftsmen

Trials	Group Mean Scores	F Ratios (Between Trials)
T-1	99.6	
T-3	102.3	.237
T-4	98.3	.802

There is marginal support of Hypothesis 3c for E_1 Draftsmen. The T-4 quality group mean is higher than that for T-3, which is in the direction of equity theory prediction. The F ratio for T-4 is not significant at the commonly minimal acceptance of .05. The Draftsmen group mean for T-4 is higher than that of T-1 which is opposite of what is predicted according to the hypothesis. Hypothesis 3c is not supported.

Minor Hypothesis 3d: A 15 percent increase in pay will moderate attitudes for E_1 and E_2.

TABLE 17

Total JDI Scores of Group Performance in the Trial 4 Period for Draftsmen

Groups	Group Mean Scores (T-3)	T-4	F Ratios (Between Trials)
E_1	(101.0)	102.3	.027
E_2	(116.0)	121.3	.954
F Ratio (Between Groups)		8.816**	

The increase of 15 percent in pay for E_2 resulted in an increase in Total JDI group mean scores for Draftsmen as compared to T-3. The F ratio of 8.816 is significant at the .01 level indicating a clear-cut difference between E_1 and E_2 drafting groups on attitude. The F ratios between trials are not significant for E_1 or E_2. Hypothesis 3d is not supported.

Trial 5 Period

Hypothesis 4 (Trial 5)

A restoration of pay to Pretrial levels for E_2 will stabilize performance and attitudes to pre-experimental levels for E_1 and E_2.

Minor Hypothesis 4a: A restoration of pay to Pretrial levels for E_2 will decrease quality of performance to pre-experimental levels for E_1 and E_2.

TABLE 18

Quality of Group Performance in the Trial 5 Period for Draftsmen

Groups	Group Mean Scores (Pretrial)	T-5	F Ratios (Between Trials)
C_1	(97.5)	98.3	.041
E_1	(103.9)	98.8	.306
E_2	(106.8)	103.2	.384
F Ratio (Between Groups)		1.541	

The quality group mean scores for Draftsmen are marginal for T-5 as compared to Pretrial quality scores. The F ratios of T-5 for both occupational groups closely resemble those of the Pretrial period. The F ratios for between trials are not significant. On the basis of the data analysis Hypothesis 4a is not supported.

Minor Hypothesis 4b: A restoration of pay to Pretrial levels for E_2 will decrease output performance for E_1 relative to T-4.

TABLE 19

Quantity of Group Performance in the Trial 5 Period for Draftsmen

Groups	Group Mean Scores (T-4)	T-5	F Ratios (Between Trials)
C_1	(95.5)	95.5	0.0
E_1	(93.3)	93.3	0.0
E_2	(99.3)	102.3	.257
F Ratio (Between Groups)		1.884	

A comparison of E_1 Draftsmen quantity performance in T-5 to the Pretrial period indicates no change in output of performance for T-5. The hypothesis is not supported.

Minor Hypothesis 4c: A restoration of pay to Pretrial levels for E_2 will result in a modification of attitudes for E_1 and E_2 as compared with their respective measures in T-4.

TABLE 20

Total JDI Scores of Group Performance in the Trial 5 Period for Draftsmen

Groups	Group Mean Scores (T-4)	T-5	F Ratios (Between Trials)
E_1	(102.3)	101.7	.006
E_2	(121.3)	119.6	.133
F Ratio (Between Groups)		7.088*	

As compared to T-4 the total JDI group mean scores for Draftsmen exhibited a minor decrease. The between group F ratio of 7.088 is significant at the .05 level for Draftsmen. Hypothesis 4c is not supported as there was no significant changes between T-4 and T-5.

Posttrial Period

Hypothesis 5 (Posttrial)

Performance levels for the Posttrial period will be the same as the Pretrial performance measures for all groups.[1]

[1]There were no minor hypotheses formulated for the Posttrial period.

TABLE 21

Quantity of Performance in the
Posttrial Period for Draftsmen

Groups	Quantity Group Mean Scores		
	(Pretrial)	T-5	F Ratios (Between Trials)
C_1	(93.3)	95.0	.196
E_1	(100.7)	95.0	.806
E_2	(99.3)	106.3	.922
F Ratio (Between Groups)		3.190	

TABLE 22

Quality of Performance in the
Posttrial Period for Draftsmen

Groups	Quality Group Mean Scores		
	(Pretrial)	T-5	F Ratios (Between Trials)
C_1	(97.5)	98.2	.086
E_1	(103.9)	99.6	.616
E_2	(106.8)	103.8	.597
F Ratio (Between Groups)		2.240	

Quantity performance for all drafting groups except E_1 was higher for the Posttrial period as compared to the Pretrial measurement period by a small margin. Comparing the Posttrial to the Pretrial the C_1 group had a higher group mean. The F ratios for both occupational groups were not significant. Relative to quantity performance Hypothesis 5 is not supported.

Quality performance for all groups[1] in the Posttrial period is slightly less than that in the Pretrial period. All F ratios lack significance indicating little difference between groups and are the same as the Pretrial period. Relative to quality performance, Hypothesis 5 is not supported.

TABLE 23

Total JDI Scores of Group Performance in the Posttrial Period for Draftsmen

Groups	Group Mean Scores (Pretrial)	Posttrial	F Ratios (Between Trials)
C_1	(103.8)	104.5	.121
E_1	(101.6)	102.9	.118
E_2	(119.1)	120.3	.132
F Ratios (Between Groups)		5.777**	

The total JDI group mean scores for the Posttrial period indicate a somewhat higher level of job satisfaction than in the Pretrial period for all groups. It is notable that the E_2 group has a higher group mean score in the Posttrial period. The F ratio of 5.777 for between groups is significant at the .01 level. This indicates that between group attitudes may have crystalized over the Pretrial to Posttrial period. However as the between trials F ratios are not significant the attitude portion of Hypothesis 5 is not supported.

[1]Quality performance for all groups was less except for C_1 Draftsmen which increased by .7.

Synthesis of Results for Section 2

Of the 14 hypotheses tested none were supported on the basis of between trials F ratios. A striking feature of the analysis appeared to be that the E_2 group's quantity performance was quite often clearly in the opposite direction that equity theory would predict.

Section 3

Section 3 of this chapter is utilized to highlight several unique findings of this research and provides a more in depth examination of certain results that have not been included in Sections 1 and 2. The statistical analysis used for this section consisted of measures of central tendency, and simple correlations and t tests. The t tests were used mainly to substantiate the significance of the correlation for a given variable relationship.

The following table represents a correlation of the "financial situation" from the demographic questionnaire (Questionnaire 1) with the pay scale from each of the seven JDIs administered during the course of this study.

TABLE 24

Correlation Coefficients of Financial Situation with JDI Pay Scales All Groups and All Trials[1]

Trial Periods	Control and Experimental Groups C_1[a]	E_1	E_2
Pretrial	.367	.349	.061
Trial 1	----	.494*	.335
Trial 2	----	.586*	.224
Trial 3	----	.607*	.094
Trial 4	----	.679*	.432*
Trial 5	----	.578*	.069
Posttrial	.304	.567*	.175

As mentioned earlier in this chapter the mean score on financial situation from Questionnaire 1 for the total population was 21.164 and is considerably lower than the national average on this same measure. Considering this a variable and the results of the Pay Scale of the JDI for each trial as variables the relationship between them seems to provide information not included in earlier analyses. The E_1 group, which was aware of extra pay to E_2, demonstrated a significant relationship between perceived financial situation and the JDI pay scales for all trials except the Pretrial period. On the other hand the E_2 group only had one significant correlation on Trial 4 (when the extra pay was reduced from 30 percent to

[1]No coefficients are shown for Trials 1-5 inclusive, because the JDI was not administered to the control group during these periods.

15 percent). This indicates that the E_1 group may have had a sensitivity relative to the extra pay for E_2.

Summary of Results

The results of this study indicate that the population for this study was in the 20 to 30 year age range and were mostly male. As a population they are somewhat dissatisfied with the major aspects of their present jobs. There were 14 hypotheses none of which were supported on the basis of between trials testing by ANOVAS and MANOVAS. Additional examinations were conducted through the use of correlation coefficients and other standard statistical techniques. The most unexpected result involved the E_2 group: whenever the output hypothesis was not marginal, that group's production moved in the opposite direction from what had been predicted.

CHAPTER V

CONCLUSIONS

The purpose of this study was to identify and measure possible moderating effects of employee-perceived equity and inequity of pay on worker performance and attitude. The theoretical model employed was Adams' theory of inequity which utilizes a cognitive ratio of outcome to input. Inequities in pay were introduced by experimental pay increases; by informing both experimental groups of the one group's extra pay, a change in the performance and attitude of each group was predicted to occur. Adams' formulation of inequity prescribes what these changes should be and in what direction.

Pay was defined as monetary reward for performance. Performance, as overt job behavior, was measured in terms of both quantity, the output for a given work group, and quality which was measured in terms of excellence for a given performance. Attitude, which is broadly defined as disposition towards a certain act, was measured by the JDI. Adams also postulates the existence of a comparator Other to which Person compares their respective outcome to input ratios. It is on this basis that equity is defined. This whole process is perceptual and, therefore, a cognitive experience. For this research there were two experimental groups and one control

group. The experimental groups, on the basis of Adams' theory, were supposed to compare their respective outcome-input ratios. The control group was utilized to provide base line comparative data for analysis. Unfortunately, the control group did not demonstrate a completely stable performance during the period of the successive trials.

Adams' formulation of equity specifically prescribes what should occur to an input when an outcome is altered. In this study pay was defined as the outcome; and performance (measured in terms of quality and quantity) and attitude were treated as inputs. In Adams' (1963a) study performance was also considered in terms of both quality and quantity. The hypotheses of this study clearly reflect this procedure. Furthermore Adams (1963a) specifically states what should occur relative to quality and quantity performance for two differently compensated groups, assuming a perception of inequity. Generally stated, and couched within the framework of this study, when conditions of inequity (i.e., undercompensation) are perceived to exist for E_1 quantity performance should increase and quality performance should decrease. At the same time, for E_2, quantity performance should decrease and quality performance should increase as a result of Person attempting to restore cognitive balance for his outcome to input ratio.

Analysis of Hypothesis and Relevant Discussion

The following analysis follows a chronological format based on trials beginning with T-2.

Hypothesis 1 consisted of a general statement that perception of inequity would result from a ten percent increase in pay to E_2. This statement was refined through the use of minor hypotheses which specifically dealt with a prediction that would be made on the basis of equity theory.[1] The first minor hypothesis stated that no alteration in quantity performance would occur for E_2 as a result of their ten percent pay increase. Compared to the quantity Pretrial measures no decrease occurred for Draftsmen. The reason for this may be that the ten percent pay increase for only four hours was not significant enough to introduce conditions of inequity for Draftsmen. Relative to quality performance there was no increase in performance for E_2 Draftsmen. Again this suggests that no inequity condition was created by the ten percent pay increase. Total JDI scores between groups did change by increasing for both E_1 and E_2 Draftsmen. This presents a possible contradiction when compared to the quantity and quality performance results. A possible explanation may be that the

---

[1]This same procedural format was followed for all hypothesis statements and will accordingly be followed in this chapter.

"Hawthorne Effect"[1] was operative. This however only partially explains the results because of the differences between performance and attitude. Perhaps a better explanation would be that attitude expression has a lower threshold than performance. Attitude is a covert phenomenon while performance is overt and it is possible that it may take a more dramatic increase in pay to bring about a perception of inequity that will result in changes in overt behavior such as performance.

The hypotheses for T-3 stated that a thirty percent increase in pay would result in measurable differences in all groups. The first minor hypothesis stated that the thirty percent increase in pay would increase the quality of performance for E_2. This did not occur. The second minor hypothesis stated that the thirty percent pay increase would decrease quality performance and increase quantity performance for E_1. Again the prediction was not substantiated. The third hypothesis stated a moderation in attitudes for both E_1 and E_2. Attitudes were different between groups but instead of going higher, especially for E_2, attitude decreased for both E_1 and E_2. The rationale employed to explain the findings of T-2 does not appear to be feasible in this case because a thirty percent increase in pay would seem large enough to be noticeable. Indeed no explanation seems to be reasonable other than that some unknown environmental factor may have confounded the results of T-3. There is a possibility

---

[1]Because these employees were singled out for special attention and consideration the groups' performances may have been altered or heightened.

that a thirty percent pay increase was too great and therefore was defined by the Ss as unrealistic. Should this last alternative explanation be correct then it suggests there is an apparent upper threshold on pay for this type of experiment. In any event, the results of T-3 are contradictory to what Adams' inequity theory would predict.

The major hypothesis for T-4 predicted that a fifteen percent increase in outcome for E_2 would affect the performance and attitudes of E_1 and E_2. The first minor hypothesis stated the fifteen percent increase in pay for E_2 would moderately increase both quality and quantity for E_2 as compared to the Pretrial period. Relative to the E_1 group the E_2 group quantity performance increased. All remaining performances decreased on relative bases. This first minor hypothesis, like all minor hypotheses for T-4, is viewed as a stringent examination of equity and may extend the theory further than its present development warrants. The first minor hypothesis (i.e., 3a) was formulated to find out what would happen to performance if pay was decreased rather than increased as had been the condition in T-2 and T-3. It is possible that even though E_2 was still receiving fifteen percent more pay relative to normal pay that the decrease from thirty percent extra pay in T-3 to fifteen percent extra pay in T-4 was viewed as a decrease in outcome for E_2 by both E_1 and E_2. If this alternative explanation is correct, and according to Adams (1963a) it is, then quantity performance should increase for E_2 and quality performance should decrease.

This was the trend for E_2 Draftsmen. Perhaps the apparent failure of the results to support the hypothesis is a consequence of the faulty formulation of the hypothesis itself. As written, it predicts changes in employee inputs resulting from an increase in outcome. (Much as stated in Hypotheses 1 and 1a.) However, in the experimental sequence, the 115 percent pay for the T-4 period represents a decrease in outcome (when compared with the 130 percent pay rate for T-3). If the hypothesis had been couched in terms of a decreasing outcome and based on Adams' concepts, the performance of the groups would have more nearly supported the hypothesis.

The second minor hypothesis for T-4 was an attempt to examine the effects of fifteen percent pay increase for E_2 after a preceding thirty percent pay increase on the E_1 group's quantity performance. According to inequity theory the E_1 group's quantity performance should have been greater in T-4 than in T-1 but less than its quantity performance in T-3. The results for this hypothesis are mixed and on the whole do not support equity theory prediction. It is possible that once again it is a question as whether the pay change from thirty percent in T-3 to fifteen percent in T-4 was perceived by the E_1 group as a decrease or increase in outcome. The available data do not furnish a plausible explanation.

The third minor hypothesis for T-4 (i.e., 3c) is much like the second hypothesis and therefore subject to the same interpretations and constraints.

The fourth minor hypothesis for T-4 (i.e., 3d) stated that a moderation of attitudes would occur when pay was increased for E_2 by fifteen percent. This hypothesis was supported. The total JDI group mean scores increased for E_1 and E_2 which might indicate that the change in extra pay resulted in perceptions of greater equity between groups. This finding may lend credence to the interpretation that attitude is more sensitive to pay stimuli than is overt behavior such as performance.

The hypothesis for T-5 predicted that the restoration of pay to normal levels would stabilize performance and attitudes to those levels recorded prior to pay increases for E_2.

The first minor hypothesis (i.e., 4a) stated that quality performance levels for E_1 and E_2 in T-5 would match those of the Pretrial period. This hypothesis was not supported. The second minor hypothesis (i.e., 4b) was like the first except only quantity performance for E_1 was emphasized. This hypothesis was also not supported. The findings of both of these hypotheses should be approached with caution. These hypotheses are too demanding on the theory because of the precision each requires in its own right. The nature of the task of Draftsmen is sufficiently variable to change the performance results on any given day. Indeed this characteristic may have markedly influenced any of the results obtained so far with the only possible exception being the attitude scores. Some comments about the nature of the white-collar job are

taken up in later discussions concerning possible limitations of this study and therefore will not be elaborated on here.

The fourth minor hypothesis for T-5 (i.e., 4d) predicted a moderation of attitudes would occur relative to T-4. Attitudes did not change from T-4 to T-5 for either the E_1 or the E_2 group.

The last major hypothesis was for the Posttrial period and stated that all performance and attitude measures would be the same as those in the Pretrial. Generally speaking all measures were slightly higher for all drafting groups in the Posttrial period.

Possible Study Limitations

The following discussion of possible limitations for this study focuses principally on methodological concerns as theoretical limitations are presented elsewhere.[1]

Sample Size

The sample size for this study was n = 50. There were forty draftsmen and ten keypunchers. When the total sample divided into three groups the resulting n size for C_1 = 16, E_1 = 17 and E_2 = 17. With a larger sample size per cell a greater confidence could be placed on the results of the ANOVA

---

[1]The theoretical limitations of this study were discussed in Chapter I in the subsections entitled "Theoretical Assumptions" and "Limitations of Study."

and correlation coefficients.[1] It is readily admitted that most researchers almost always say they need a greater sample size.

Length of Trials

The length of each trial in this experiment was four hours. A more nearly optimum length of trial should be at least a week, or possibly two weeks. The length of the trials for this experiment was partly a function of time and financial resources. As a major organizational change was scheduled for three weeks after the Pretrial period longer trials were out of the question.[2] Also the longer the trial the more money that would be required for extra pay. This is a resource issue not easily resolved in all cases.

Length of Time Between Trials

Ideally there should be at least a week between each trial. By increasing the interval between trials the experimenter would have more confidence in the effect of the independent variable on a given trial.

---

[1]The data in Section 2 of Chapter IV were limited to Draftsmen for statistical interpretation. The extreme standard deviation for Data Conversion Operators required this. The resulting sample size per cell for Data Conversion Operators were $C_1 = 4$, $E_1 = 3$ and $E_2 = 3$. Sample size per cell for Draftsmen were $C_1 = 12$, $E_1 = 14$ and $E_2 = 14$.

[2]The employees making up the population did not know of the impending organizational changes.

Method of Pay

The method of pay is clearly a problem in experimental procedure. In this study, management stipulated that the extra pay be clearly identified as coming from the researcher. This requirement may have confounded the study to a considerable extent. It certainly weakened the link between pay and performance and thus it directly impacted on the cognitive outcome to input ratio of the worker.

Task

The use of white-collar employees surely added significant complications. As compared to blue-collar tasks, white-collar work tasks are more often varied and intellectual in character. Both of these attributes increase the difficulties in specifying and obtaining precise measures of performance quantity and quality.

Performance Measures

The use of supervisors for performance evaluation of Draftsmen was a limitation imposed on this study. As there were no means for evaluation of draftsmen performance a method had to be devised. The method depended on the Squad Leaders' capability in evaluating both quality and quantity performance.

The above limitations, together with the theoretical limitations set forth in Chapter I, constitute a rather formidable listing. Obviously another research effort designed to

test and possibly extend the findings of this study should seek to overcome these limitations.

Conclusions

To the best of this writer's knowledge this study is the first to attempt to test Adams' inequity theory in an actual work environment, and as such is innovative thereby adding to the information already provided by those who have tested the theory in a more controlled setting. The data obtained were real data and therefore did not always conform to plans, nor did the data always complement standardized statistical methods. But these are hazards of field research.

The inclusion of the JDI was unique: no previous studies had included an attitude measure in connection with the investigation of equity theory. As the reader is well aware of by now, the JDI provided some of the most clear-cut between groups results; the credit for this must be shared with those who designed the JDI.

This study dealt with three research problems: the effect of changing pay on employee performance; the effect of changing pay on employee attitudes; and the perception by one group of a pay increase awarded to another group.

With respect to the first research problem, on the basis of the results of this study it is not concluded that changing pay does moderate employee performance.[1] Conclusions

---

[1]This section of Chapter V closely follows the "Research Problems" as defined in Chapter I. Necessary elaborations are included to more clearly define the researcher's position.

cannot be drawn as to the exact manner in which employee performance was moderated as related to quality and quantity measures. Quality performance provided the greatest difficulty for the researcher to explain why the group mean scores were in a certain direction for a given trial. Indeed, quality performance changes for E_1 and E_2 groups exhibited what appeared to be an almost random pattern of change (as evidenced by Figure 10 on page 117). None of the statistical analyses used in this study aided in interpretation of this phenomenon. One plausible explanation might be in the actual measure itself. Drafting supervisors may not be able to adequately evaluate Draftsmen quality performance. Relative to quality performance for Data Conversion Operators, the type of keypunching task bears directly on the number of errors produced in a given period. During the course of this study the type of keypunching task could not be held constant; instead the changing task reflected the normal work scheduling for the department.

An explanation of quantity performance poses a somewhat different problem than does quality performance. The quantity performance, in nature of a trend as demonstrated in Figure 11 on page 118, was opposite as to what could have been expected. This may possibly be explained by considering reinforcement theory. In an "empirical sense, a reinforcer is an event which, employed appropriately, increases the probability of occurrence of a response in a learning situation" (Hilgard & Marquis', p. 202). Pay could have been viewed by the E_2 group

as a reward for quantity performance. If such was the case, then as long as extra pay was being received performance would continue to increase until it reached a physical ceiling (e.g., no more output was possible with the resources at hand). Although this explanation might serve to justify why quantity performance demonstrated the behavior it did, this conclusion is opposite that offered by Adams' inequity theory. Adams postulates that quality performance for E_2 should increase but that the quantity performance should decrease. Adams seems to be implicitly acknowledging the existence of the reinforcement phenomenon for E_2 but only for the quality variable.

The second research problem dealt with the moderating effects of pay on attitude. Based on the data analysis it is concluded that changes in pay do moderate between group worker attitudes.

A third research question was whether an increase in pay for one group (E_2) would be defined as a decrease by the other group which has knowledge of the increase but did not itself receive an increase. It is concluded that such an occurrence may alter the outcome to input ratios of the E_1 group. Figure 11 provides a striking example of how quantity performance decreased for E_1 beginning dramatically with T-3 (when the pay for E_2 was increased to 130 percent of normal). As in the finding relative to the first research question this finding is in reverse of what Adams postulates for the quantity performance. Reinforcement theory may also be used

to explain this behavior. The trend for E_1 closely resembles an extinction trend line when reinforcement is withdrawn.

A focus of this study was to examine Adams' (1965) predictions as they relate to Person's adjustments to his outcome to input ratio. Specifically Adams' theory states that when pay is increased for the E_2 group that quantity performance should decrease and quality performance should increase. The opposite should occur for the E_1 group. The results of this study indicate that instead of quantity performance decreasing for E_2 it increased. The results for E_2 quality and for the E_1 group are not clear enough to warrant judgment on the remainder of Adams' theory.

In conclusion, and on the basis of this study, it seems that Adams' theory of inequity is a viable structure for explaining employee behavior as it relates to a pay and performance and attitude relationship. The information gathered in this study does not provide sufficient understanding to evaluate Adams' predictions concerning the quality performance variable. Inasmuch as Adams makes no predictions concerning the effects of pay on worker attitudes, the results of this inquiry have no bearing on his theory of inequity.

If the reinforcement theory explanation of the findings for quantity performance and pay relationships is creditable then it would appear that classical wage incentive programs are a viable means to increase productivity. This conclusion is not viewed as being contrary to the basic outcome to input paradigm offered by Adams nor is it viewed as being inconsistent

with the concept of the comparator Other. This conclusion also fits very well within the parameters offered by exchange theory.

Recommendations

A continuation of study in this area is recommended with the following emphases:

1. Adams' theory as a theory should be examined in a work environment characterized by greater control. Ideally this environment would have blue-collar workers performing largely manual tasks which are amenable to precise measurement of the quality and quantity of production.
2. The amount of pay changes should be less dramatic and each change should be in effect for longer periods.
3. Pay should be distributed in a normal fashion by the employing organization and the distribution should take place as soon after the trial period as possible.
4. The between-trial period should be extended to no less than one week.
5. Sample size should be at least n = 120 for a three-group design. This would mean that each group would have forty employees; this would allow for absences and labor turnover and still leave a sufficiently large number for each cell.

6. A complete endorsement from all involved managers must be acquired and maintained for the entire period of the experiment. If this study were to be conducted in an unionized firm this endorsement should include the union representatives.

In general it is recommended that other designs and theories as they relate to exchange theory be employed in examining what is viewed as a very fundamental and normal behavioral phenomenon. The exchange model provides the broad perspective required to fully understand and appreciate the worker, his job and his employer. Equity theory appears for the present to be the best means for increasing this understanding and, as this study has demonstrated, has facilitated this undertaking. The equity concept has a unique capability to incorporate a broad range of contributions that may be made by the worker or the firm. Pay, quantity performance and quality represent only a small number of these possible contributions so the potentialities for further useful research are exceedingly broad.

APPENDIX A

QUESTIONNAIRES USED IN THIS STUDY

Appendix A consists of three parts: (1) A Demographic Questionnaire that was administered to all participants, (2) a summary of the Job Description Index (JDI) that was used to measure attitude and the Retirement Descriptive Index, and (3) a copy of the JDI.

For Appendix A the cover sheets of the Demographic Questionnaire and the JDI were omitted. Both of these cover sheets had the words "University of Oklahoma," "Confidential Data," and a space for recording the four digit employee code number. Both questionnaires were the same for Draftsmen and Data Conversion Operators except where their respective professions were mentioned in the Demographic Questionnaire.

To keep this questionnaire anonymous, please do not write your name anywhere on this page.

1 Personal code number (last four digits of your telephone number): _____

2 Year of birth _____

3 Sex: Male _____ Female _____

4 How many months have you been employed by STAR? _____ months

5 How many months have you been working as a draftsman at STAR? _____ months

6 How many months had you been working as a draftsman <u>before</u> you were employed by STAR? _____ months

7 How many months of <u>training</u> have you had as a draftsman in any of the following institutions?

High school	_____ months
Other schools (such as vo-tech, private tech schools)	_____ months
Armed forces/National Guard	_____ months
On-the-job training at STAR	_____ months
On-the-job training at other firms	_____ months

8 Were you born in Oklahoma? Yes_____ No_____

9 How many <u>years</u> have you been living in the Oklahoma City area? _____ years

10 Show the highest grade completed in school by checking (X) <u>one</u> of the following:

Some grade school	_____
Completed grade school	_____
Some high school	_____
Completed high school	_____
Some college	_____
Completed junior college	_____
Completed college	_____

11 Think of your impressions about your present financial situation. How well do the following words and phrases describe your present financial situation as you see it?

If the word or phrase describes your present financial situation as you see it, circle the (Yes).
If it does <u>not</u> describe your present financial situation, circle the (No).
If you cannot decide whether it describes your present financial situation, circle the (?).

FINANCIAL SITUATION

Barely living on Income	Yes	?	No	Good pension plan	Yes	?	No
Insecure	Yes	?	No	Have to make do	Yes	?	No
Satisfactory	Yes	?	No	Serious financial problems	Yes	?	No
Well off	Yes	?	No	No money to meet emergencies	Yes	?	No
Steady	Yes	?	No	Income from investments	Yes	?	No
Bad	Yes	?	No	Need help from children	Yes	?	No
Need outside help	Yes	?	No	Income provides luxuries	Yes	?	No
Worry about it	Yes	?	No	Self supporting	Yes	?	No
High income	Yes	?	No	Good insurance plan	Yes	?	No

Summary of the Job Description Index

The JDI is a means for measuring job satisfaction. Job satisfaction, for the purposes of this experiment, is defined as the attitude a worker has about his job at the time he completes the JDI.[1] This definition is in agreement with Smith et al who states that "Job satisfactions are feelings or affective responses to facets of the situation" (1969, p. 6). Smith et al asserts that "these feelings are associated with a perceived difference between what is expected as a fair and reasonable return (or, when the evaluation of future prospects is involved, what is aspired to) and what is experienced, in relation to the alternatives available in a given situation" (1969, p. 6). This previous quote plus some additional thoughts comprises what Smith et al calls her general model. This model or theoretical base in in agreement with Adams' inequity theory and this research effort. The point of this discussion is to illustrate in a brief manner the compatibility of the JDI and this experiment, and its use as a suitable measuring instrument.

The JDI provides a means for measuring job satisfaction in the areas of pay, promotion, supervision, work and co-workers. The JDI consists of seventy-two items; eighteen for work, eighteen for supervision, eighteen for co-workers, nine for pay and nine items for promotion. Each of the five

---

[1]Part of this definition was taken from Smith et al (1969, p. 6)

groupings consists of a list of adjectives or descriptive phrases. The S is asked to circle "yes" next to each item which describes his pay, promotion, etc., and "no" for each item which does not. A "?" response is reserved for items on which the S cannot decide. "Yes" answers are scored 3, "no" answers are scored 0 and "?" answers are scored 1. These responses are totaled to provide the index of job satisfaction. The greater the total the higher the level of job satisfaction.

For the reliability and homogenity the corrected split-half internal consistency coefficients are reported to exceed .80 for each of the scales. Hulin (1969) also reports the same stability over time. Validation of the JDI has undergone extensive examination with impressive results.[1] The JDI according to Vroom (1964) and Robinson, et al (1969) was developed through extensive and high quality research.

Of special note in the JDI is the verbal level of the items as they are quite low and therefore do not require the S to understand complicated or vague abstractions. In addition the JDI is easily administered and can be scored in a short time.[2]

---

[1]Vroom (1964) presents a comprehensive review of his examination and that of Hulin, Smith, Kendall and Lacke (1963). Additional support for the JDI may also be found in Robinson, Athanasion, and Head (1969).

[2]This description of the JDI follows very closely that of Robinson, John P., Robert Athanasion, and Kendra B. Head, "Measures of Occupational Attitudes and Occupational Characteristics," (Appendix A to Measures of Political Attitudes), Survey Research Center, Institute for Social Research, Ann Arbor, 1969, p. 105.

The JDI as utilized in this experiment was altered by placing a "yes," "?" and "no" in this order to the right of each question. In the unaltered JDI the S is asked to write in a "Y," "N" or "?" to the immediate left of the question. This change was made to facilitate answering and scoring the questions. Changes in the instructions were also made to accommodate the change made in the answer format. No other changes were made.

The Retirement Descriptive Index (RDI) as originated by Smith et al. (1969) was developed in the same rigorous manner as the JDI. The RDI does lack the extensive testing common to the JDI but has a high degree of validity according to Smith et al. (p. 84, 1969). Four scales make up the RDI: the Activities Scale, the Finances Scale, the People Scale and the Health Scale. Only the Finance Scale was utilized in this study. It was included in the Demographic Questionnaire, and scored in the same manner as the JDI. The mean score of 30.96 was arrived at on the basis of a national survey and was used for comparison purposes in this study.

Job Description Index

THINK OF YOUR IMPRESSIONS ABOUT YOUR PRESENT JOB
How well do the following words and phrases describe your present job as you see it today?

If the word or phrase describes your present job as you see it today, circle the YES.
If it does not describe your present job today, circle the NO.
If you cannot decide whether it describes your present job today, circle the ? .

SUPERVISION

Asks my advice	Yes	?	No	Tells me where I stand	Yes	?	No
Hard to please	Yes	?	No	Annoying	Yes	?	No
Impolite	Yes	?	No	Stubborn	Yes	?	No
Praises good work	Yes	?	No	Knows job well	Yes	?	No
Tactful	Yes	?	No	Bad	Yes	?	No
Influential	Yes	?	No	Intelligent	Yes	?	No
Up-to-date	Yes	?	No	Leaves me on my own	Yes	?	No
Doesn't supervise enough	Yes	?	No	Lazy	Yes	?	No
Quick tempered	Yes	?	No	Around when needed	Yes	?	No

THINK OF YOUR IMPRESSIONS ABOUT YOUR PRESENT JOB.
How well do the following words and phrases describe your present job as you see it today

If the word or phrase describes your present job as you see it today, circle the YES.
If it does not describe your present job today, circle the NO.
If you cannot decide whether it describes your present job today, circle the ? .

WORK

Fascinating	Yes	?	No	Useful	Yes	?	No
Routine	Yes	?	No	Tiresome	Yes	?	No
Satisfying	Yes	?	No	Healthful	Yes	?	No
Boring	Yes	?	No	Challenging	Yes	?	No
Good	Yes	?	No	On your feet	Yes	?	No
Creative	Yes	?	No	Frustrating	Yes	?	No
Respected	Yes	?	No	Simple	Yes	?	No
Hot	Yes	?	No	Endless	Yes	?	No
Pleasant	Yes	?	No	Gives sense of accomplishment	Yes	?	No

THINK OF YOUR IMPRESSIONS ABOUT YOUR JOB.
How well do the following words or phrases describe your present job as you see it today?

If the word or phrase describes your present job as you see it today, circle the YES.
If it does not describe your present job today, circle the NO.
If you cannot decide whether it describes your present job today, circle the ? .

PAY

Income adequate for normal expenses	Yes	?	No
Satisfactory profit sharing	Yes	?	No
Barely live on income	Yes	?	No
Bad	Yes	?	No
Income provides luxuries	Yes	?	No
Insecure	Yes	?	No
Less than I deserve	Yes	?	No
Highly paid	Yes	?	No
Underpaid	Yes	?	No

THINK OF YOUR IMPRESSIONS ABOUT YOUR JOB.
How well do the following words or phrases describe your present job as you see it today?

If the word or phrase describes your present job as you see it today, circle the YES.
If it does not describe your present job today, circle the NO.
If you cannot decide whether it describes your present job today, circle the ? .

PROMOTIONS

Good opportunity for advancement	Yes	?	No
Opportunity somewhat limited	Yes	?	No
Promotion on ability	Yes	?	No
Dead-end job	Yes	?	No
Good chance for promotion	Yes	?	No
Unfair promotion policy	Yes	?	No
Infrequent promotions	Yes	?	No
Regular promotions	Yes	?	No
Fairly good chance for promotion	Yes	?	No

THINK OF YOUR IMPRESSIONS ABOUT YOUR PRESENT JOB.
How well do the following words and phrases describe your present job as you see it today?

If the word or phrase describes your present job as you see it today, circle the YES.
If it does not describe your present job today, circle the NO.
If you cannot decide whether it describes your present job today, circle the ? .

CO-WORKERS

Stimulating	Yes	?	No	Talk too much	Yes	?	No
Boring	Yes	?	No	Smart	Yes	?	No
Slow	Yes	?	No	Lazy	Yes	?	No
Ambitious	Yes	?	No	Unpleasant	Yes	?	No
Stupid	Yes	?	No	No privacy	Yes	?	No
Responsible	Yes	?	No	Active	Yes	?	No
Fast	Yes	?	No	Narrow interests	Yes	?	No
Intelligent	Yes	?	No	Loyal	Yes	?	No
Easy to make enemies	Yes	?	No	Hard to meet	Yes	?	No

APPENDIX B

JOB DESCRIPTIONS AND STAR MANUFACTIRING TABLE OF ORGANIZATION

The contents of Appendix B are the job descriptions of employees and managers at STAR Manufacturing Company who were involved in this study. A Table of Organization is also included to aid the reader in acquiring an overall view of the organizational structure.

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY: MANAGER, INDUSTRIAL RELATIONS	INSERT IN: POLICY & PROCEDURE MANUAL

1.0	TITLE	Supervisor, Drafting Control
2.0	REPORTS TO	Chief Draftsman
3.0	SUPERVISES	Weights Clerk Senior Blueprint Operator
4.0	WORK RELATIONS	Manager, Engineering Chief Structural Engineer Chief Estimating Engineer Chief Project Engineer Engineers - Design Manager, Material and Production Control Supervisor, Production Control Supervisor, Material Control Assistant Purchasing Manager Buyer - Purchasing Supervisor, Dealer Coordination Regional Coordinators District Coordinators National Accounts Coordinator Supervisor, Estimating Estimators Supervisor, Operations - Information Services Squad Leaders - Production
5.0	GENERAL RESPONSIBILITIES	Schedules and monitors to pre-set schedules all jobs and drawings from entry into the Drafting Section until exit from the Engineering Department to Material and Production Control or customer.
6.0	SPECIFIC RESPONSIBILITIES	6.01 Reviews and recommends scheduling procedures such as "short interval" scheduling, etc., for adoption by the Engineering Department.
		6.02 Monitors the scheduled drafting of orders with Sales Service, Material and Production Control, the Production Departments, and other Engineering sections.

6.03 Monitors the scheduled drafting of all approval drawings and completion dates with Regional Coordinators.

6.04 Assess for Production Control the number of drafting hours necessary to complete a specific job.

6.05 Reviews estimated drafting hours versus actual drafting hours on a continuing basis to refine and control the scheduling system.

6.06 Reviews all sales orders for clarity and completeness so that when the jobs are assigned to a squad this squad can proceed with the job with a minimum of delay. Clarification may require the completion of the "Request for Clarification or Hold" forms.

6.07 Directs and supervises the Blueprint functions specifically as related to bills of material, drawings, etc., and coordinates the activities of the Blueprint Room with other STAR departments.

6.08 Assumes the duties of Chief Draftsman when Chief Draftsman is not available due to illness, vacation, etc.

6.09 Directs and supervises the activities of "Weights Clerk" in conjunction with Material and Production Control to determine "theoretical scrap", establish parameters for the size of plates to be stocked by the plants, and to provide a basis for better scrap control.

7.0 MINIMUM EDUCATION AND EXPERIENCE

7.01 Incumbent must be a highschool graduate and have completed courses in Drafting and Design, algebra, and trigonometry, or a two year course in Drafting and Design from a reputable tech school.

7.02 A minimum of four years progressively responsible experience in the preparation of structural steel fabrication drawings, two years of which must have been with STAR. He must also have a working knowledge of practical structural design theory and structural steel fabrication shop practice.

7.03 A demonstrated supervisory ability.

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY:	INSERT IN: POLICY & PROCEDURE MANUAL

1.0 TITLE	Data Conversion Supervisor
2.0 REPORTS TO	Supervisor, Computer Operations
3.0 DIRECTS	Lead Data Conversion Operator Data Conversion Operators
4.0 WORK RELATIONS	Computer Operators User personnel providing computer input
5.0 GENERAL RESPONSIBILITIES	Supervises all personnel engaged in keypunching, key verification and in the operation of other data conversion devices.
6.0 SPECIFIC RESPONSIBILITIES	6.01 Schedules workloads.
	6.02 Distributes work assignments.
	6.03 Checks accuracy of keypunched material.
	6.04 Evaluates keypunch personnel performance for salary administration, training and promotion.
	6.05 Interviews job applicants.
	6.06 Maintains control of data while in keypunch section.

BULLETIN

STAR MANUFACTURING COMPANY

No	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION	ISSUED BY: MANAGER, INDUSTRIAL RELATIONS	INSERT IN: POLICY & PROCEDURE MANUAL

1.0 TITLE

Squad Leader - Production

2.0 REPORTS TO

Chief Draftsman

3.0 DIRECTS

Production Squad Personnel

4.0 WORK RELATIONS

Chief Structural Engineer
Chief Estimating Engineer
Chief Project Engineer
Engineers - Design
Supervisor, Production Control
Supervisor, Material Control
Buyer - Purchasing
Supervisor, Dealer Coordination
Regional Coordinators
District Coordinators
Supervisor, Estimating
Estimators
Supervisor, Operations - Information Services
Squad Leaders - Production

5.0 GENERAL RESPONSIBILITIES

Under general direction, plans and supervises the preparation of all drawings, shipping lists and other material required to process the orders assigned to his production squad.

6.0 SPECIFIC RESPONSIBILITIES

6.01 Confers with supervisor regarding section policy, procedure, staffing and related detail matters.

6.02 Trains squad personnel.

6.03 Upon receipt, review each order. Review job information to assure compatibility of sales order, dealer information and engineering.

a) Distributes them to squad personnel on a complexity and priority basis.

b) Assures that preliminary B/M goes to Material Control.

c) Provides suggested approaches for detailing by subordinates, verbally or by sketch.

6.04 Prepares preliminary billing for Purchasing and Material Control Departments' acquisition of materials required.

6.05 Upon request, investigates specific detail complaints and reports to supervisor. Assigns simple complaints to subordinates and reviews results.

6.06 Assists in formulation of wage adjustment, transfer, or termination recommendations and, upon request, assists in other actions regarding production squad personnel.

6.07 Develops special parts or standards from repeating orders or previous problems as assigned.

6.08 Provide liaison with assigned section of the company on problems or coordination.

6.09 Assist Chief Draftsman in extra project work requiring drafting expertise.

7.0 MINIMUM EDUCATION AND EXPERIENCE

7.01 Incumbent must be a highschool graduate and have completed courses in Drafting and Design, algebra, and trigonometry, or a two year course in Drafting and Design from a reputable tech school.

7.02 A minimum of three years experience in the preparation of structural steel fabrication and erection drawings, two years of which must have been in this industry and one year with STAR. He must also have a working knowledge of practical structural design theory and structural steel fabrication shop practice.

7.03 A demonstrated supervisory ability.

RECEIVED JUN 11 1974

STAR BUILDINGS

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTION	DATE: REV:
DISTRIBUTION:	ISSUED BY: DIRECTOR, ENGINEERING	INSERT IN:

1.0	TITLE	Manager, Drafting
2.0	REPORTS TO	Director, Engineering
3.0	DIRECTS	Chief Draftsman, Production Chief Draftsman, Product and Systems
4.0	WORK RELATIONS	Manager, Product Engineering Manager, Product Development Manager, Design Engineering Manager, Sales Service Manager, Plants Manager, Purchasing Manager, Material and Production Control Manager, Information Services
5.0	GENERAL RESPONSIBILITIES	Plans, directs, supervises and coordinates all Drafting activities concerning order processing for all buildings sold by the Company, assuring scheduled, accurate, efficient and economical completion of all orders. Reviews design and details on a periodic basis to insure that manufacturing and material costs are such to optimize company's manufacturing costs. Plans, directs, supervises and coordinates Drafting activities in regards to computer programs for detailing and order processing and is responsible for the maintenance of all standard components, piece marks, details, packages for all standard buildings.
6.0	SPECIFIC RESPONSIBILITIES	
	6.01	Supervises Drafting sections generating timely, accurate, efficient and economical operations.
	6.02	Coordinates the scheduled Drafting of orders with the Sales Service, Material and Production Control and Production Departments and other engineering Departments.
	6.03	Develops, prepares, and analyzes Drafting control reports covering efficiency, schedules, production comparison to standards, performance, quality, complaints, etc.

6.04 Interprets existing Drafting policy and recommends modification in staffing and related Drafting matters; Develops procedures and supplies to insure conformance to and implementation of approved policies.

6.05 Develops, reviews and verifies Drafting processing standards used by schedulers and estimators assuming accountability for resulting deviations of standards to actual.

6.06 Advises subordinates supervisors to resolve detail procedure or other problems.

6.07 Approves requisitions for routine supplies required by the Drafting room and/or Blueprint room. Consults with Director, Engineering regarding unusual expenditures.

6.08 Administers personnel and employee relation programs covering employee development and training, compensation, appraisal and staffing.

6.09 Prepares and administers an annual Drafting budget assuming responsibility for budget deviation and seeking approval for deviations of 5% and expenditures exceeding $500.

6.10 Plans, coordinates and maintains all standard part details, packages, and items relating to standard bills of material for all standard components processed and produced by Company.

6.11 Assists in resolving field problems caused by fabrication or detailing errors and visits job sites to resolve these problems as necessary.

6.12 Initiates and maintains standard Drafting Procedures Manual for standardization of methods to be used by all Drafting Employees.

6.13 Maintains, coordinates and/or initiates computer programs relating to Drafting detailing or bills of material orders.

0 MINIMUM EDUCATION AND EXPERIENCE

7.01 Equivalent of two years college or trade school course in Drafting and Design.

7.02 A minimum of six years progressively responsible experience in the preparation of structural steel fabrication drawings, four years of which must have been with STAR. He must also have a working knowledge of practical structural design theory and structural steel fabrication shop practice.

7.03 A demonstrated supervisory ability.

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY: MANAGER, INDUSTRIAL RELATIONS	INSERT IN: POLICY & PROCEDURE MANUAL

1.0	TITLE	Checker - Production
2.0	REPORTS TO	Squad Leader - Production
3.0	DIRECTS	None
4.0	GENERAL RESPONSIBILITIES	Under direction, checks all drawings, shipping lists and other material prepared by members of Production Squad.
5.0	SPECIFIC RESPONSIBILITIES	5.01 Checks fabrication drawings, anchor bolt plans, erection plans, shipping lists and other material as assigned for completeness, accuracy, clarity, feasibility, conformity with design notes and standard practices.
		5.02 Trains squad personnel.
		5.03 Upon request, assists Squad Leader in formulation of wage adjustments and other actions concerning the detail squad.
		5.04 Assumes the responsibility of the Squad Leader in his absence.
6.0	MINIMUM EDUCATION AND EXPERIENCE	6.01 Incumbent must be a highschool graduate and have completed courses in Drafting and Design, algebra, and trigonometry, or a two year course in Drafting and Design from a reputable tech school.
		6.02 A minimum of three years experience in the preparation of structural steel fabrication and erection drawings, two years of which must have been in this industry and one year with STAR. He must also have a working knowledge of practical structural design theory and structural steel fabrication shop practice.
		6.03 A demonstrated supervisory ability.

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY: MANAGER, INDUSTRIAL RELATIONS	INSERT IN: POLICY & PROCEDURE MANUAL

1.0	TITLE	Senior Draftsman - Production
2.0	REPORTS TO	Squad Leader - Production
3.0	SUPERVISES	None
4.0	GENERAL RESPONSIBILITIES	Under general supervision prepares drawings and/or shipping lists required to process orders of maximum complexity.
5.0	SPECIFIC RESPONSIBILITIES	
		5.01 Analyzes an assigned special order.
		5.02 Determines applicability of standard components.
		5.03 Prepares a shipping list and necessary fabrication drawings required for production, shipping, cost accounting and erection.
		5.04 Prepares preliminary bills for Purchasing Department's acquisition of materials required.
		5.05 Submit all work to Checker (designated by Squad Leader) for accuracy and completeness check.
6.0	MINIMUM EDUCATION AND EXPERIENCE	6.01 Incumbent must be a highschool graduate and have completed courses in Drafting and Design, algebra, and trigonometry, or a two year course in Drafting and Design from a reputable tech school.
		6.02 A minimum of three years experience in the preparation of structural steel fabrication and erection drawings, or closely related field, two years of which must have been in this industry. He must also have a working knowledge of practical structural design theory and structural steel fabrication shop practice.

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY: MANAGER, INDUSTRIAL RELATIONS	INSERT IN: POLICY & PROCEDURE MANUAL

1.0	TITLE	Draftsman - Production
2.0	REPORTS TO	Squad Leader - Production
3.0	DIRECTS	None
4.0	GENERAL RESPONSIBILITIES	Under supervision, prepares drawings and/or shipping lists required to process orders.
5.0	SPECIFIC RESPONSIBILITIES	5.01 Analyzes an assigned modified standard or special order.
		5.02 Determines applicability of standard components.
		5.03 Prepares a shipping list and necessary fabrication drawings required for production, shipping, cost accounting, and erection.
		5.04 Prepares preliminary bills for Purchasing Department's acquisition of materials required.
		5.05 Submit all work to Checker (designated by Squad Leader) for accuracy and completeness check.
6.0	MINIMUM EDUCATION AND EXPERIENCE	6.01 Incumbent must be a highschool graduate and have completed courses in Drafting and Design, algebra, and trigonometry, or a two year course in Drafting and Design from a reputable tech school.
		6.02 A minimum of one year experience in the preparation of structural steel fabrication and erection drawings, or closely related field, or equivalent education.

STAR BUILDINGS

BULLETIN

STAR MANUFACTURING COMPANY

NO.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY: MANAGER, INDUSTRIAL RELATIONS	INSERT IN: POLICY & PROCEDURE MANUAL

1.0	TITLE	Junior Draftsman - Production
2.0	REPORTS TO	Squad Leader - Production
3.0	SUPERVISES	None
4.0	GENERAL RESPONSIBILITIES	Under close supervision, prepares drawings and/or shipping lists required to process orders.
5.0	SPECIFIC RESPONSIBILITIES	5.01 Analyzes an assigned standard or modified standard order.
		5.02 Determines the applicability of standard components and packages.
		5.03 Prepares a shipping list and necessary fabrication drawings required for production, shipping, cost accounting, and erection.
		5.04 Prepares preliminary bills for Purchasing Department's acquisition of materials required.
		5.05 Submit all work to Checker (designated by Squad Leader) for accuracy and completeness check.
6.0	MINIMUM EDUCATION AND EXPERIENCE	6.01 Incumbent must be a highschool graduate and have completed courses in Drafting and Design, algebra, and trigonometry, or a two year course in Drafting and Design from a reputable Tech school.
		6.02 No experience required.

BULLETIN

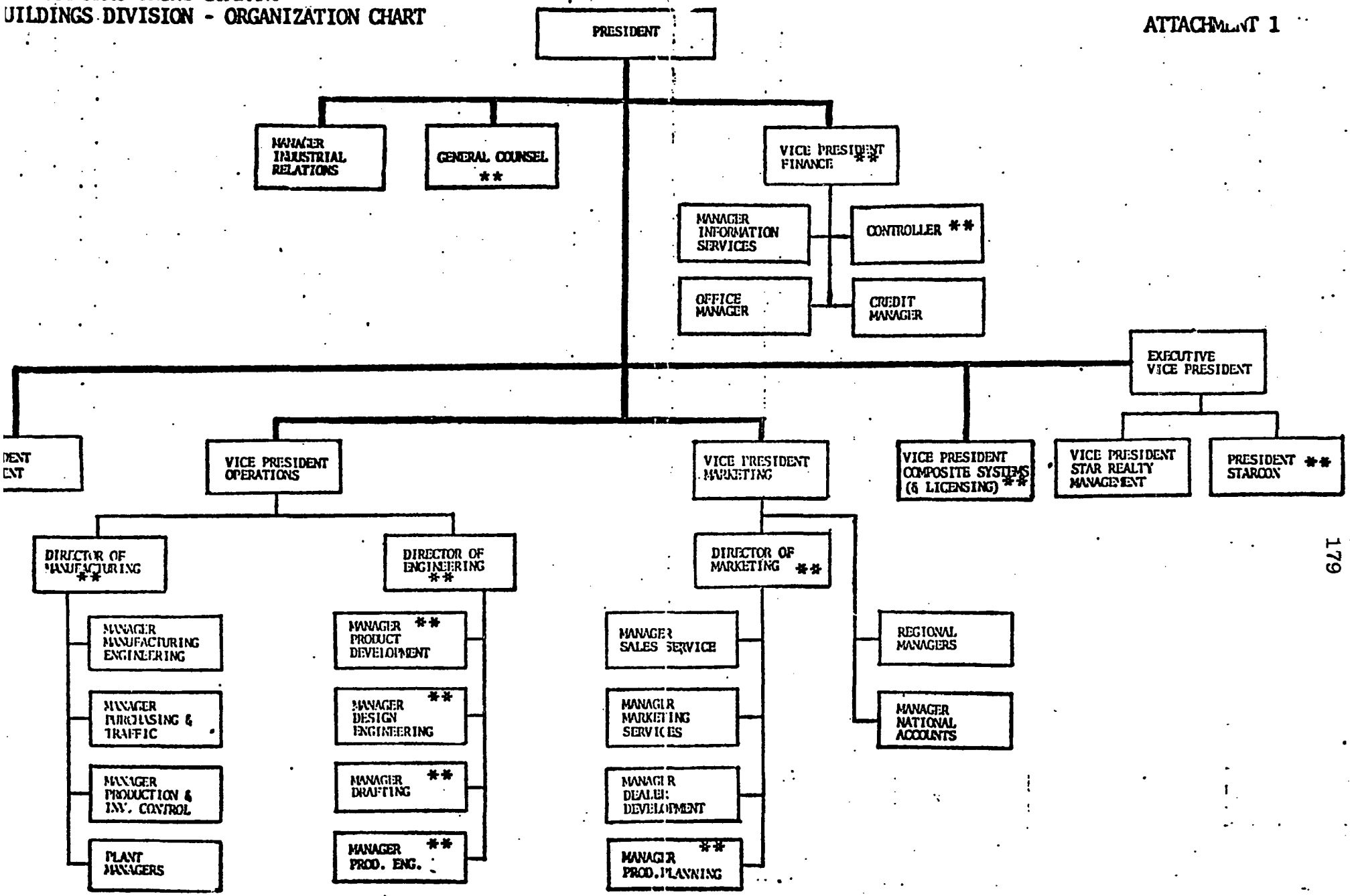
STAR MANUFACTURING COMPANY

No.	SUBJECT: JOB DESCRIPTIONS	DATE: / REV:
DISTRIBUTION:	ISSUED BY:	INSERT IN: POLICY & PROCEDURE MANUAL

1.0	TITLE	Data Conversion Operator
2.0	REPORTS TO	Data Conversion Supervisor
3.0	WORK RELATIONS	Data Conversion personnel
4.0	GENERAL RESPONSIBILITIES	Keypunches and key-verifies data as directed by keypunch supervisor.
5.0	SPECIFIC RESPONSIBILITIES	
	5.01	Preparing punched cards in accordance with instructions provided by supervisors.
	5.02	Maintaining sequence and control of source documents.
	5.03	Detecting errors and repunching corrected information.
	5.04	Maintaining neat and orderly work area.

TAR MANUFAC RING COMPANY
UILDINGS DIVISION - ORGANIZATION CHART

ATTACHMENT 1



** Indicates a promotion or reassignment,

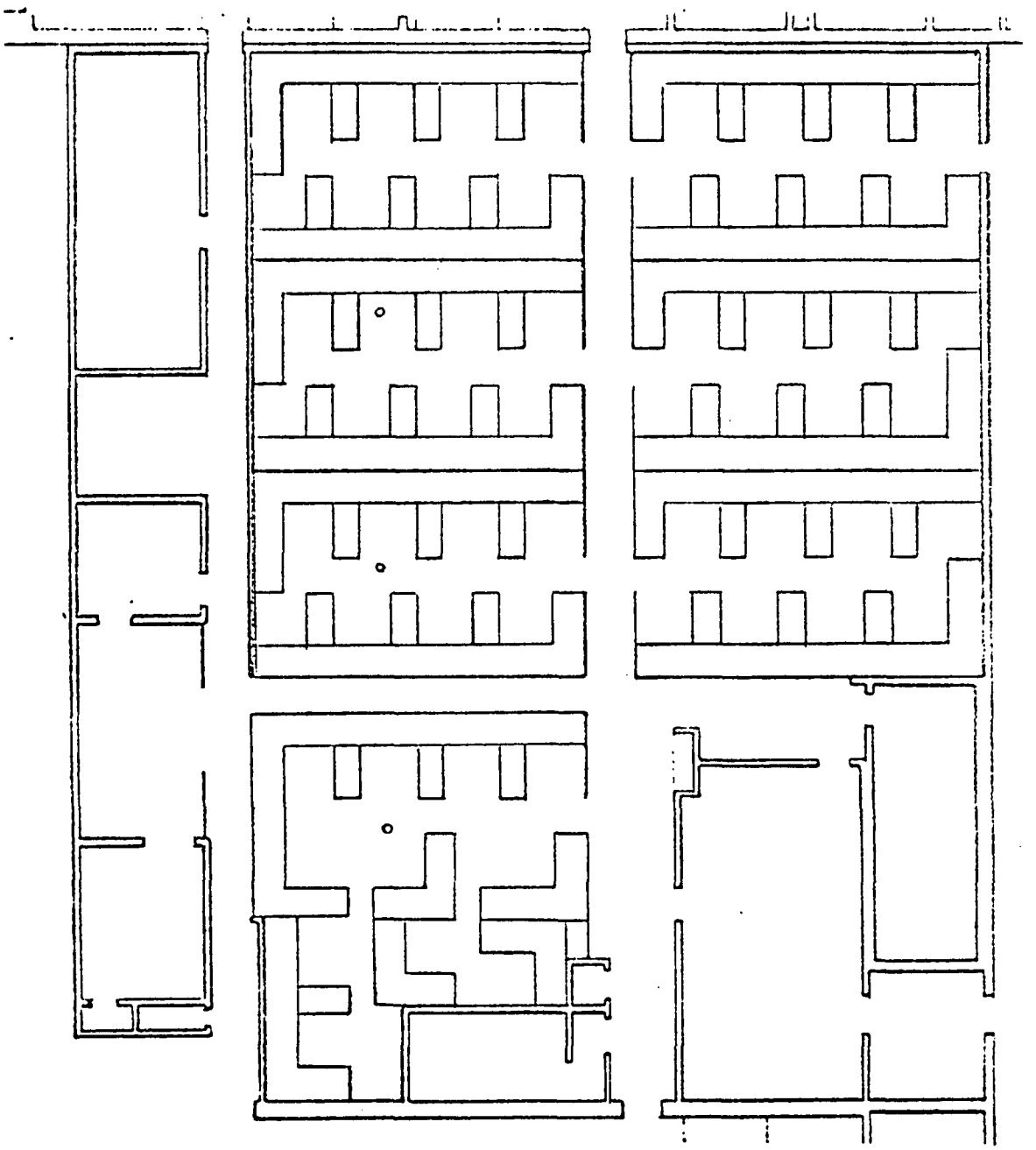
APPENDIX C

FLOORPLANS FOR THE DRAFTING AND KEYPUNCH WORK AREAS

The following floorplans were prepared for the study after is completion by the Draftsmen involved in this experiment. Before reduction the scale for the drafting work area was 1/8" = 1' - 0. The scale for the keypunch room is 1/8" = 1' - 0.

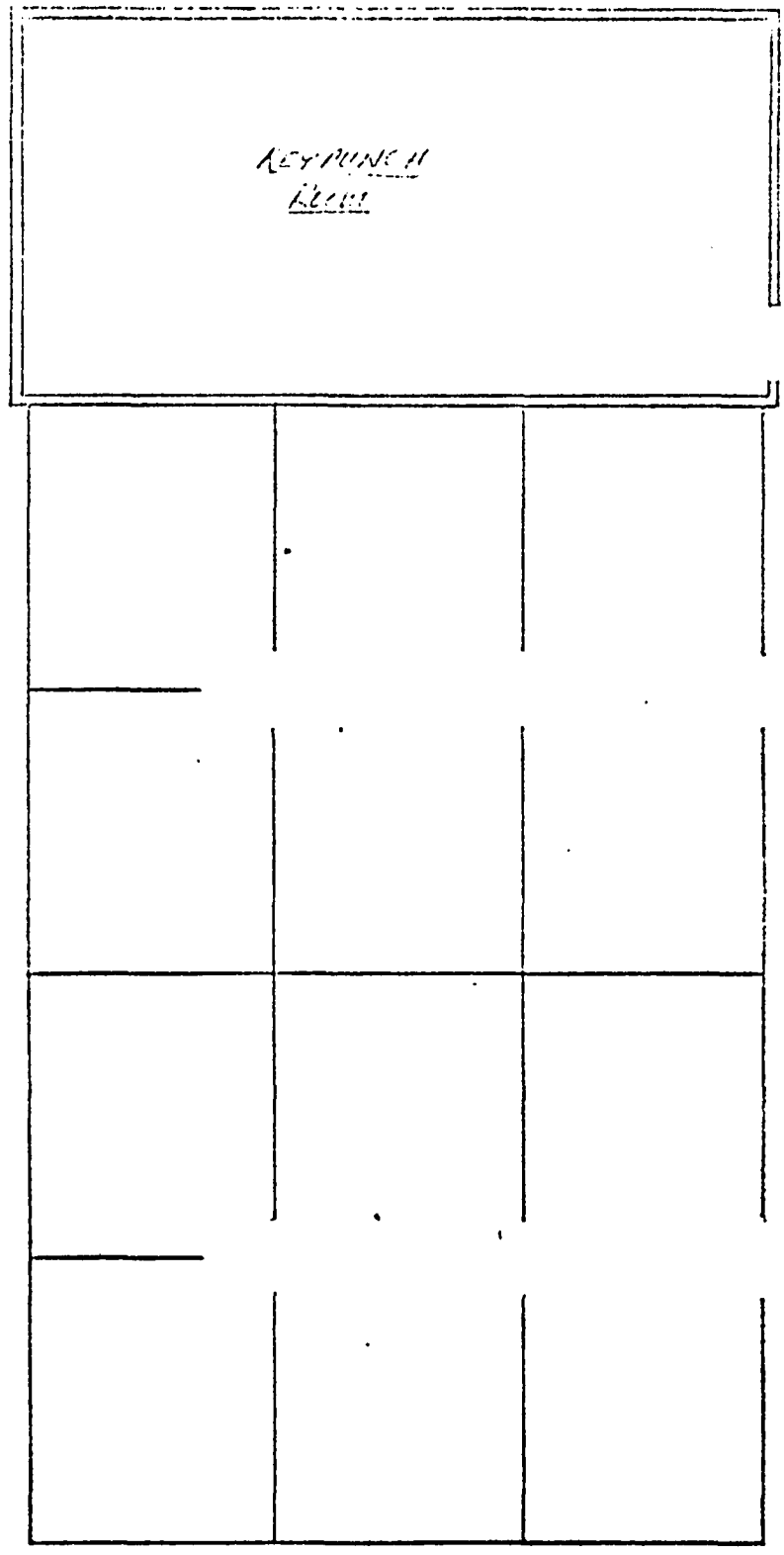
Drafting Work Area
(Reduced from 1/8" = 1' - 0)

NORTH ↑



Keypunch Work Area
(1/8" = 1' - 0)

NORTH ↑



APPENDIX D

TRANSCRIPT OF THE EMPLOYEE BRIEFING

The following is a transcript of the briefing for all drafting employees. The principal speakers are Weldon Cain, Drafting Manager, and William H. Keown from the University of Oklahoma. The only editing on this transcript was in the nature of punctuation and other such grammatical changes that might aid a reader. The same presentation was made a second time to the Data Conversion Operators.

Mr. Cain There is a gentleman Paul Shaffer here, professor at OU and he is working on his doctorate as I understand it. I assume his thesis is involved in sort of a survey about what affects productivity amongst white-collar or that type of worker, and the, STAR had extended the courtesy thus to volunteer you if you wish to be volunteered to participate in this study. It is purely voluntary--which I had asked your Squad Leaders to tell you.

Mr. Keown, who is a doctor at OU in the School of Business Adminstration, I assume, is going to explain the thing to you and go into it so I won't attempt to try to. Paul is the daddy

of this thing, but I think he feels he is so involved in it he would rather let someone else more objective, like Dr. Keown, explain it to you; because this is Paul's little project. So I don't know of anything else to say other than they are both from OU and I'm an aggie so--(laughter)

Dr. Keown That's quite all right. (laughter)

Mr. Cain I'm not apologizing. (laughter)

Dr. Keown As Weldon said, this is a research effort. We are both in the College of Business Administration and we approached management at STAR to see if they would help us in this research effort--it has to do with attitudes of people towards many aspects of their job. The study that we proposed/planned has been conducted in many places across the country over the last few years. But this is unique in a number of ways, one of which is that as far as we know this kind of study has never dealt with draftsmen and their attitudes towards their work. So we have designed the study, and management at STAR is not involved in any way except you might say the hospitality of offering us the opportunity to come and collect the data. They have not been involved in the design of the study, the collection of the data, or the interpretation of the

results. That responsibility rests with us. Because the study does involve comparison of attitudes of you people, looking at drafting jobs with what's been found in other studies, I'm not able to talk very much about it at this point; because I'm afraid that what I say might influence your attitudes and therefore the information we might get could not be true about how you think about things. And so I won't talk more about the study itself today, except to talk about what would be expected of you as participants.

The part you would play would be small: mostly this afternoon. We have two questionnaires to fill out, one is sort of a background information kind of thing about each participant, which tells about the length of time on the job, education, residence here in the Oklahoma City area and things of that sort. This would be filled out today and that would be the end of it. And another questionnaire would be filled out today and this is the one that deals with attitudes towards the job. And this same questionnaire, the one you will see today, the second one, would be also filled out again several more times during the next two weeks. This is on the basis that people's attitudes towards their work change

over time. I don't know how it is with you, but it's certainly true with me that the way I think about my work is different one month to the next; it's even probably different on Friday afternoon and Monday morning. (laughter) We want to get several recordings, you might say, of your attitudes toward your work at several different points in time during the next two weeks. This would be, Paul would be coming in here to distribute the questionnaire at the last 15 minutes or so before a lunch hour one day. It would just take a few minutes; after you have been through it once today it won't take long to fill it out again; but that would be the extent of your involvement--providing this information today and then, in subsequent days, three or four times in the next couple of weeks.

The questionnaires will be, the completed questionnaires will only be handled by Paul, I will see neither. They are confidential, when he gets back to Norman he will punch the data on punch cards and destroy the questionnaires. We are only interested in the attitudes of the group, not of individuals. There will be no name on the questionnaires, any of them; we would like a code number on them--a number of your own choosing, a four digit number of your own choosing--so that

we can put all the questionnaires from one person together to see how it (his attitudes) changed, if it did change, over time. There will have to be a little piece of paper, a separate piece of paper, which Paul gets today and keeps separately which has the same code number and your name so that we can write a check for you to express our appreciation for your participation in this study. You can't write a check to a code number. That's the only connection between your name and your code number, that chit will be collected separately. What I am trying to say is a rather elaborate way to explain the confidentiality or the anonymity of your responses as far as anybody is concerned, except Paul. The STAR people will not handle the questionnaires at all, neither will I; and none of us will know what names are associated with what code numbers.

I think you will find it interesting and after the experiment is over we propose to have another meeting to talk in general about how things are in this kind of study elsewhere and what we were really trying to measure and so on from these instruments. If you have questions I would be glad to try and respond if I can without compromising the study in any way. The purpose of my remarks was intented to tell you

in a general way what this is about and what would be entailed from your end. Does anybody have a question?

Mr. Cain I want to say one thing I meant to say in opening--I don't say it now to inhibit you--but I do want you to know what's going on--Paul had wanted this session recorded so that he could gather all the information from the start of the session, the beginning of the session, so that we could know anything might have been said by the people, their attitude, or anything. So this is being recorded in the attic here--which I meant to say before I started. However I do want you to know it. If you cut me down, it's fine so long as I hear you (laughter).

Dr. Keown One of the peculiarities about doctoral research is the need for completeness, and so on. We have written up and shown to the management, Weldon, Pete and others a sort of script for the remarks I was supposed to have made. It was obvious I didn't read anything off, but I think I have covered the main points that were in that, and we wanted to be straightforward with management of what we would say to you people--in a general way, you see, in anticipation. Now for the purpose of the dissertation and the research it

would be all right to put that script in and say that Bill Keown said substantially the following; but it's a lot better if we have a transcript of what he said without any gaps or anything else in it. (laughter) What was actually said, so that we hope there will be complete, a completeness of the record, that's what is necessary in this kind of research; and we feel that the research design we are engaged in here overcomes some of the difficulties of what earlier studies have found. They ran into problems and we are benefiting from their experience by replicating the good part of what they did. So that's the reason for the taping--to have the full story. Can that be shut off at this point, or?

Mr. Cain I would think you would want to record the questions so that you would know how the answers might have affected your research.

Dr. Keown Well as I was thinking, yes, as we get later in the meeting. Is there any place here that it can cut it off or does it run indefinitely:

Mr. Cain I can cut it off.

Dr. Keown Oh no, not now, I didn't mean right now but I meant is the switch in this room.

Mr. Cain He is in this room (pointing to adjoining room).

Dr. Keown Not yet. If anybody has a question I will be glad to answer it because it will be part of my explanation. Do you have a question? Any questions?

Mr. Cain You don't have to give your name before you ask a question (laughter)

Dr. Keown Well Paul, why don't we distribute the first questionnaire.

Mr. Cain Do you want to ask if everybody wants to participate?

Dr. Keown I assume they will, and if they don't they won't fill one out.

Mr. Cain What I wanted to be sure of is that they do understand a check will be written to them. And if they are not going to ask, that's their problem, if they are not going to ask how much the checks will be. I thought this would be a question they will ask.

Mr. Cain By the way, any questions about this those guys will be happy to answer any that they can.

Dr. Keown This first questionnaire has a cover sheet, it's just one page long--on that second page. This second questionnaire which you will fill several times isn't much; it's just a small job, it's several pages--

Dr. Keown It's a little crowded for you to fill these out without your neighbor seeing. I don't think you can shield them so-- Let me say a word about the code number please. Pick any four digit number that you can remember. It might be, if you have got a social security card, it might be four digits out of that, the last four digits out of that; or four digits out of your telephone number; or your street address; or off your driver's license; or your birth date, if you were born today you might write 0619 for the sixth month, nineteenth day; or any number that you can think about again. We are hoping there won't be any duplications putting it that broadly, just choose a number.

Paul S. I would suggest that you not put 2222 or something like that because the probability of a group this size having two 2222's isn't as small as you think. Mix them up, make all the numbers different.

Dr. Keown If you pick a number that is sort of personally related to your life, a phone number or something, then you more likely won't be . . . anyone else need pencils?

Mr. Cain Next time I have a meeting I will know how many of you all don't take notes.

Employee Is a fountain pen okay?

Dr. Keown On the little slip you write your code number and your name, that will be detached, not associated with the questionnaire--that little chit on the top there. On the questionnaires from here on will be just the code numbers. Put your name up here (pointing to the little chit).

Dr. Keown Paul is making the rounds so you put the little chit in the envelope for him, put your name and code number on it.

Dr. Keown Do we have all the little chits now with your name and code on them?

Dr. Keown Paul will pass out the second one, questionnaire, and swap you the first one whenever you finish...

Mr. Cain You the one who wanted a large sample?

Employee Oh to put a social security number here?

Paul S. Be sure to put your code number here please.

Employee No lying now (laughter)

Dr. Keown Does everybody have the second questionnaire yet? Anybody not got the second questionnaire?

Dr. Keown I think that whenever you finished the second questionnaire, be sure the code number is on the front; Paul will be at the door. You can just leave whenever you are finished; we don't have to all wait and go together.

Mr. Cain You can go back to work or leave.

APPENDIX E

EXTRA PAY MEMORANDUM DISTRIBUTED TO THE E_1 AND E_2 GROUPS

June 23, 1974

To: Draftsmen who are taking part in the OU study.

From: Paul Shaffer, OU Study Coordinator

OU has made available some extra pay for some of you participating in the study. This temporary extra pay is for today only and for only a four hour period. The following people will receive an extra 10% of their hourly pay for the first four hours of this workday (6-24-74):

Names of E_2 Draftsmen

or

Data Conversion Operators

DRAFTSMEN PERFORMANCE REPORT FORM

Quantity of Work During this 4-hour Period			Draftsmen:	Quality of Work During this 4-hour Period		
Less Than Normal Output	His Normal Output	More Than Normal Output		Below His Normal Quality	His Normal Quality	Above His Normal Quality
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%
_____%	_____ (100%)	_____%	_____	_____%	_____ (100%)	_____%

SELECTED BIBLIOGRAPHY

Books

Allport, G. W.; Vernon, P. E.; and Lindzey, G. Study of Values. (Rev. Ed.) Boston: Houghton-Mifflin, 1951.

Anderson, Barry F. The Psychology Experiment: An Introduction to the Scientific Method. Belmont, California: Wadsworth Publishing Company, Inc., 1967.

Andrews, I. R., ed. Managerial Compensation. Ann Arbor, Michigan: Foundation for Research on Human Behavior, 1965.

Argyris, C. Integrating the Individual and the Organization. New York: John Wiley, 1964.

_____. Personality and Organization. New York: Harper, 1957.

Atkinson, J. W. An Introduction to Motivation. Princeton, N. J.: Van Nostrand, 1964.

Bass, B. M. Organizational Psychology. Boston: Allyn and Bacon, 1965.

Belcher, D. W. Wage and Salary Administration. 2nd Edition. New Jersey: Prentice-Hall, 1962.

Bindra, D. Motivation: A Systematic Reinterpretation. New York: Ronald, 1959.

Blauner, R. Alienation and Freedom. Chicago: University of Chicago Press, 1964.

Bower, Gordon H., ed. The Psychology of Learning and Motivation. Vol. 6. New York: Academic Press, 1972.

Brehm, J. W. and Cohen, A. R. Exploration in Cognitive Dissonance. New York: Wiley, 1962.

Brown, J. A. C. The Social Psychology of Industry. Baltimore: Penquin, 1954.

Brown, J. S. The Motivation of Behavior. New York: McGraw-Hill, 1961.

Campbell, D. T., and Stanley, J. C. "Experimental and Quasi-Experimental Designs for Research on Teaching." In N. L. Gage (Ed.), Handbook of Research on Teaching. Chicago: Rand McNally, 1963, pp. 171-246.

Campbell, J. P.; Dunnette, M. D.; Lawler, E. E.; and Weick, K. E. Managerial Behavior, Performances and Effectiveness. New York: McGraw-Hill, 1970.

Chase, Clinton I. Elementary Statistical Procedures. New York: McGraw-Hill, Inc., 1967.

Cofer, C. N., and Appley, M. H. Motivation: Theory and Research. New York: Wiley, 1964.

Dawes, Robyn M. Fundamentals of Attitude Measurement. New York: John Wiley & Sons, Inc., 1972.

Dickinson, Z. C. Compensating Industrial Effort. New York: Ronald, 1937.

Edwards, Allen L. Experimental Design in Psychological Research. New York: Holt, Rinehart and Winston, Inc., 1968.

Emshoff, James R. Analysis of Behavioral Systems. New York: Macmillan Co., 1971.

Ferber, Robert. Market Research. New York: McGraw-Hill Book Company, Inc., 1949.

Festinger, L. A Theory of Cognitive Dissonance. Evanston, Ill.: Row, Peterson, 1957.

French, W. The Personnel Management Process: Human Resources Administration. 2nd Ed. Boston: Houghton Mifflin Company, 1970.

Gellermen, S. W. Motivation and Productivity. New York: American Management Association, 1963.

Gellerman, S. W. Management by Motivation. New York: American Management Association, 1968.

Guilford, J. P. and Fruchter, Benjamin. Fundamentals Statistics in Psychology and Education. New York: McGraw-Hill Book Company, 1973.

Haire, M. Psychology in Management. New York: McGraw-Hill, 1956.

Hampton, D. R.; Summer, Charles E.; and Webber, Ross A. Organizational Behavior and the Practice of Management. Glenville, Ill.: Scott, Foresman and Company, 1973.

Harmon, Harry H. Modern Factor Analysis. 2nd Edition, Rev. Chicago: University of Chicago Press, 1967.

Hays, William L. Statistics. New York: Holt, Rinehart and Winston, 1963.

_____. Basic Statistics. Belmont, California: Brooks/ Cole Publishing Company, 1967.

Herzberg, F. Work and the Nature of Man. Cleveland: World Publishing, 1966.

_____; Mausner, B.; Peterson, R. O.; and Capwell, D. F. Job Attitudes: Review of Research and Opinion. Pittsburgh: Psychological Service of Pittsburgh, 1957.

_____; Mausner, B.; and Snyderman, B. The Motivation to Work. 2nd Edition. New York: Wiley, 1959.

Hilgard and Marquis'. Conditioning and Learning. Revised by Gregory A. Kimble. New York: Appleton-Century-Crofts, Inc., 1961.

Hill, Joseph E. and Kerber, August. Models, Methods and Analytical Procedures in Education Research. Detroit: Wayne State University Press, 1967.

Holland, J. G., and Skinner, B. F. The Analysis of Behavior. New York: McGraw-Hill, 1961.

Homans, G. C. The Human Group. New York: Harcourt, Brace, 1950.

_____. Social Behavior: Its Elementary Forms. New York: Harcourt, Brace and World, 1961.

Hoppock, Robert. Job Satisfaction. New York: Harper & Brothers Publishers, 1935.

Horney, K. The Neurotic Personality of Our Time. New York: Norton, 1937.

Hull, C. L. Principles of Behavior. New York: Appleton-Century, 1943.

Hull, C. L. Essentials of Behavior. New Haven, Conn.: Yale, 1951.

_____. A Behavior System. New Haven, Conn.: Yale, 1952.

Irwin, Francis W. International Behavior and Motivation: A Cognitive Theory. New York: J. B. Lippincott Co., 1971.

Jaques, Elliott. Measurement of Responsibility. Carbondale, Ill.: University of Southern Illinois Press; London: Heinemann, 1956.

_____. Equitable Payment. New York: Wiley, 1961.

_____. Time-Span Handbook. London: Heinemann Educational Books Ltd., 1964.

_____. Work, Creativity, and Social Justice. New York: International Universities Press, Inc., 1970.

Kelly, Joe. Organizational Behavior. Homewood, Illinois: Richard D. Irwin, Inc. and The Dorsey Press, 1969.

Klugh, Henry E. Statistics: The Essentials for Research. New York: John Wiley & Sons, Inc., 1970.

Kuriloff, A. H. Reality in Management. New York: McGraw-Hill, 1966.

Lawler, E. E. Pay and Organizational Effectiveness; A Psychological View. McGraw-Hill, 1971.

Lawrence, Roy. Motive and Intention. Evanston: Northwestern University Press, 1972.

Likert, R. New Patterns of Management. New York: McGraw-Hill, 1961.

Lippman, Steven A. Elements of Probability and Statistics. New York: Holt, Rinehart and Winston, Inc., 1971.

Logan, Frank A. and Wagner, Allan R. Reward and Punishment. Boston: Allyn and Bacon, 1966.

March, James G., and Simon, Herbert A. Organizations. New York: John Wiley and Sons, 1958.

Maslow, A. H. Motivation and Personality. New York: Harper, 1954.

Madsen, K. B. Theories of Motivation. Kent, Ohio: The Kent State University Press and Munkgaard, 1968.

McClelland, D. C. The Achieving Society. Princeton, N. J.: Van Nostrand, 1961.

McGregor, D. The Professional Manager. New York: McGraw-Hill, 1967.

McGregor, D. The Human Side of Enterprise. New York: McGraw-Hill, 1960.

Mood, Alexander M. and Graybill, Franklin A. Introduction to the Theory of Statistics. New York: McGraw-Hill Book Company, Inc., 1963.

Osgood, C. E. Method and Theory in Experimental Psychology. New York: Oxford University Press, 1953.

Patchen, M. The Choice of Wage Comparisons. Englewood Cliffs, N. J.: Prentice-Hall, 1961.

Patchen, Martin. Participation, Achievement, and Involvement on the Job. New Jersey: Prentice-Hall, Inc., 1970.

Phillips, John L., Jr. Statistical Thinking. San Francisco: W. H. Freeman and Company, 1973.

Ray, William S. Statistics in Psychological Research. New York: Macmillan Company, 1962.

Richardson, Roy. Fair Pay and Work. Carbondale and Edwardsville: Southern Illinois University Press, 1971.

Roethlisberger, F. J., and Dickson, W. J. Management and the Worker. Cambridge, Mass.: Harvard, 1939.

Ryan, Thomas Arthur. Intentional Behavior. New York: The Ronald Press Company, 1970.

Sayles, Leonard R. Behavior of Industrial Work Groups Prediction and Control. New York: Wiley, 1958.

Scanlan, Burt K. Principles of Management and Organizational Behavior. New York: John Wiley and Sons, Inc., 1973.

Schein, E. H. Organizational Psychology. Englewood Cliffs, New Jersey: Prentice-Hall, 1965.

Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, 1956.

Simon, H. A. Administrative Behavior. 2nd Edition. New York: Macmillan, 1953.

Skinner, B. F. Science and Human Behavior. New York: Macmillan, 1953.

Smith, Henry Clay. Psychology of Industrial Behavior. New York: McGraw-Hill Book Company, 1964.

Smith, Patricia Cain; Kendall, Lorne M. & Hulin, Charles L. The Measurement of Satisfaction in Work and Retirement. Chicago: Rand McNally & Company, 1969.

Spear, Mary Eleanor. Practical Charting Techniques. New York: McGraw-Hill Book Company, 1969.

Spence, K. W. Behavior Theory and Conditioning. New Haven, Conn.: Yale, 1956.

Strother, George B., ed. Social Science Approaches to Business Behavior. Homewood: The Dorsey Press, Inc., and Richard D. Irwin, Inc., 1962.

Stouffer, S. A.; Suchman, E. A.; DeVinney, L. C.; Star, S. A. and Williams, R. M. The American Soldier: Adjustment During Army Life. Vol. 1. Princeton, N. J.: Princeton University Press, 1949.

Taylor, F. W. The Principles of Scientific Management. New York: Harper, 1911.

The American Assembly. Wages Prices Profits and Productivity. New York: Columbia University, 1959.

Torrence, George W. The Motivation and Measurement of Performance. Washington, D. C.: BNA Books, 1967.

Tolman, E. C. Purposive Behavior in Animals and Men. New York: Appleton-Century, 1932.

Underwood, Benton J. Experimental Psychology. Appleton-Century-Crofts, 1966.

Viteles, M. S. Motivation and Morale in Industry. New York: Norton, 1953.

Vroom, V. H. Work and Motivation. New York: Wiley, 1964.

Walker, C. R. and Guest, R. H. The Man on the Assembly Line. Cambridge, Mass.: Harvard, 1952.

Weiner, B. J. Statistical Principles in Experimental Design. New York: McGraw-Hill Book Company, 1962.

Weiner, Barnard. Theories of Motivation from Mechanism to Cognition. Chicago: Marham Publishing Company, 1972.

Whitehead, T. N. Leadership in a Free Society. Cambridge: Harvard University Press, 1947.

Whyte, W. F. Human Relations in the Restaurant Industry. New York: McGraw-Hill, 1948.

Whyte, W. F., Melville Dalton, Donald Roy, Leonard Sales, Orvis Collins, Frank Miller, George Strauss, Friedrick Fuerstenberg, Alex Bavelas. Money and Motivation. New York: Harper & Brothers, 1955.

Woodward, J. Industrial Organization: Theory and Practice. London: Oxford University Press, 1965.

Yoder, D. Personnel Management and Industrial Relations. Englewood Cliffs, N. J.: Prentice-Hall, 1956.

Zaleznik, A.; Christensen, C. R.; and Roethlisberger, F. J. "The Motivation, Productivity, and Satisfaction of Workers: A Predictive Study." Boston: Harvard University, Graduate School of Business Administration, 1958.

Periodicals

Adams, J. S., and Rosenbaum, W. B. "The Relationship of Worker Productivity to Cognitive Dissonance about Wage Inequities." Journal of Applied Psychology, Vol. XLVI (1962), pp. 161-164.

_____. "Toward an Understanding of Inequity." Journal of Abnormal and Social Pscyhology, Vol. LXVII (1963a) pp. 422-36.

_____. "Wage Inequities, Productivity and Work Quality." Industrial Relations, Vol. III, No. 1 (1963b), pp. 9-16.

_____. "Inequity in Social Exchange." In L. Berkowitz (Ed.), Advances in Experimental Social Psychology, Vol. II. New York: Academic, 1965.

_____. "Effects of Overpayment: Two Comments on Lawler's Paper." Journal of Personality and Social Psychology, Vol. X (1968), pp. 315-16.

_____, and Jacobsen, P. R. "Effects of Wage Inequities on Work Quality." Journal of Abnormal and Social Psychology, Vol. LXIX (1964), pp. 19-25.

Alderfer, C. P. "An Empirical Test of a New Theory of Human Needs." Organizational Behavior and Human Performance, Vol. IV (1969), pp. 142-75.

Alderson, W., and Miles, W. M. "Toward a Formal Theory of Transactions and Transvection." Journal of Marketing Research, Vol. II (May, 1965), pp. 117-27.

Anderson, Bo, and Robert Shelly. "A Replication of Adams' Experiment and a Theoretical Formulation." Acta Sociologica, Vol. XIII (1967), pp. 1-10.

Anderson, E. E. "The Externalization of Drive: I. Theoretical Considerations." Psychological Review, Vol. XLVIII (1941a), pp. 204-24.

Andrews, I. R. "Wage Inequity and Job Performance: An Experimental Study." Journal of Applied Psychology, Vol. LI, No. 1 (1967), pp. 39-45.

_____, and Henry, M. M. "Management Attitudes Toward Pay." Industrial Relations, Vol. III (1963), pp. 29-39.

_____, and Valenzi, E. R. "Overpay Inequity of Self-Image as a Worker: A Critical Examination of an Experimental Induction Procedure." Organizational Behavior and Human Performance, Vol. V (1970), pp. 266-76.

Ash, P. "The S.R.A. Employee Inventory--A Statistical Analysis." Personnel Psychology, Vol. VII (1954), pp. 337-64.

_____, and Reitman, W. R. "Performance as a Function of Motive Strength and Expectancy of Goal Attainment." Journal of Abnormal and Social Psychology, Vol. LIII (1956), pp. 361-66.

Babshuk, N., and Goode, W. J. "Work Incentives in a Self-Determined Group." American Sociological Review, Vol. XVI (1951), pp. 679-87.

Baehr, M. E. "A Factorial Study of the S.R.A. Employee Inventory." Personnel Psychology, Vol. VII (1954), pp. 319-36.

Bass, B. M. "Ability, Values, and Concepts of Equitable Salary Increases in Exercise Compensation." Journal of Applied Psychology, Vol. LII (1968), pp. 299-303.

Behrend, H. "Absence and Labour Turnover in a Changing Economic Climate." Occupational Psychology, Vol. XVII (1953), pp. 69-79.

Bendig, H. W., and Stillman, E. L. "Dimensions of Job Incentives Among College Students." Journal of Applied Pscyhology, Vol. XLII (1958), pp. 367-71.

Blood, M. R., and Hulin, C. L. "Alienation, Environmental Characteristics, and Worker Responses." Journal of Applied Psychology, Vol. LII (1967), pp. 284-90.

Blum, M. L., and Russ, J. J. "A Study of Employee Attitudes toward Various Incentives." Personnel Psychology, Vol. XIX (1942), pp. 438-44.

Brayfield, A. H., and Crockett, W. H. "Employee Attitudes and Employee Performance." Psychological Bulletin, Vol. LII (1955), pp. 396-424.

Brenner, M. H., and Lockwood, H. L. "Salary as a Predictor of Salary: A 20-Year Study." Journal of Applied Psychology, Vol. XLIX (1965), pp. 295-98.

Campbell, H. "Group Incentives." Occupational Psychology, Vol. XXVI (1952), pp. 15-21.

Cantril, H. "Identification with Social and Economic Class." Journal of Abnormal and Social Psychology, Vol. XXVIII (1933), pp. 259-73.

_____, and Allport, G. W. "Recent Applications of the Study of Values." Journal of Abnormal and Social Psychology, Vol. XXVIII (1933), pp. 259-73.

_____. "The Hawthorne Studies: A Radical Criticism." American Sociological Review, Vol. XXXIII (1967), pp. 403-16.

Centers, R. "Motivational Aspects of Occupational Stratification." Journal of Social Psychology, Vol. XXVIII (1948), pp. 187-217.

_____, and Cantril, H. "Income Satisfaction and Income Aspiration." Journal of Abnormal and Social Psychology, Vol. XLI (1946), pp. 64-69.

Chalupsky, A. B. "Incentive Practices as Viewed by Scientists and Managers of Pharmaceutical Laboratories." Personnel Psychology, Vol. XVII (1964), pp. 385-401.

Chant, S. N. F. "Measuring the Factors that Make a Job Interesting." Personnel Journal, Vol. XI (1932), pp. 1-4.

Chapanis, Natanlia P., and Chapanis, Alphonse. "Cognitive Dissonance: Five Years Later." Psychological Bulletin, Vol. LXI, No. 1 (January, 1964), pp. 1-21.

Clarke, A. V., and Grant, D. L. "Application of a Factorial Method in Selecting Questions for an Employee Attitude Survey." Personnel Psychology, Vol. XIV (1961), pp. 131-39.

Collins, O.; Dalton, M.; and Roy, D. "Restriction of Output and Social Cleavage in Industry." Applied Anthropology, Vol. V, No. 3 (1946), pp. 1-14.

Cravens, R. W., and Renner, K. E. "Conditioned Appetitive Drive States: Empirical Evidence and Theoretical Status." Psychological Bulletin, Vol. LXXIII (1970), pp. 212-220.

Crespi, L. P. "Amount of Reinforcement and Level of Performance." Psychological Review, Vol. LI (1944), pp. 341-57.

Dabas, Z. S. "The Dimensions of Morale: An Item Factorization of the S.R.A. Employee Inventory." Personnel Psychology, Vol. XI (1958), pp. 217-34.

Dalton, M. "The Industrial 'Rate-Buster': A Characterization." Applied Anthropology, Vol. VII (1948), pp. 5-18.

Dickinson, C. "Ratings of Job Factors by Those Choosing Various Occupational Groups." Journal of Counseling Psychology, Vol. I (1954), pp. 188-89.

Dunnette, M. D. (Ed.). "The Role of Financial Compensation in Managerial Motivation." Organizational Behavior and Human Performance, Vol. II (1967), pp. 175-216.

_____, and Bass, B. M. "Behavioral Scientists and Personnel Management." Industrial Relations, Vol. II, No. 3 (1963), pp. 115-30.

_____; Campbell, J. P.; and Hakel, M. D. "Factors Contributing to Job Satisfaction and Job Dissatisfaction in Six Occupational Groups." Organizational Behavior and Human Performance, Vol. II (1967), pp. 143-74.

Edwards, W. "The Theory of Decision Making." Psychological Bulletin, Vol. LI (1954), pp. 380-417.

Evan, William M., and Roberta G. Simmons. "Organizational Effects of Inequitable Rewards: Two Experiments in Status Inconsistency." Administrative Science Quarterly, Vol. XIV (1966), pp. 224-237.

Evans, M. G. "Conceptual and Operational Problems in the Measurement of Various Aspects of Job Satisfaction." Journal of Applied Psychology, Vol. LIII (1969), pp. 93-101.

_____, and Molinari, L. "Equity, Piece-Rate Overpayment, and Job Security: Some Effects on Performance." Journal of Applied Psychology, Vol. LIV (1970), pp. 105-14.

Festinger, L. "A Theory of Social Comparison Processes." Human Relations, Vol. VII (1954), pp. 117-40.

Friedman, A., and Goodman, P. S. "Wage Inequity, Self-Qualifications, and Productivity." Organizational Behavior and Human Performance, Vol. II (1967), pp. 406-17.

Galbraith, J. R., and Cummings, L. L. "An Empirical Investigation of the Motivational Determinants of Task Performance: Interactive Effects Between Instrumentality-Valence and Motivation-Ability." Organizational Behavior and Human Performance, Vol. II (1967), pp. 237-57.

Georgopoulos, B. S.; Mahoney, G. M.; and Jones, N. W. "A Path-Goal Approach to Productivity." Journal of Applied Psychology, Vol. XLI (1957), pp. 345-53.

Ghiselli, E. E. "The Forced-Choice Technique in Self-Description." Personnel Psychology, Vol. VII (1954), pp. 201-08.

Glennon, J. R.; Owens, W. A.; Smith, W. J.; and Albright, L. E. "New Dimensions in Measuring Morale." Harvard Business Review, Vol. XXXVIII (1960), pp. 106-07.

Goodman, P. S., and Friedman, Abraham. "An Examination of Adams' Theory of Inequity." Administrative Science Quarterly, Vol. IVI (Sept., 1970), pp. 271-88.

_____. "An Examination of the Effect of Wage Inequity in the Hourly Condition." Organizational Behavior and Human Performance, Vol. III (1968), pp. 340-52.

Goodman, P. S. "An Empirical Examination of Elliott Jaques' Concept of Time Span." Human Relations, Vol. XX (1967), pp. 155-70.

Gordon, M. E. "An Evaluation of Jaques' Studies of Pay in Light of Current Compensation Research." Personnel Psychology, Vol. XXII (1969), pp. 369-89.

Gruenfeld, L. W., and Weissenberg, P. "Supervisory Characteristics and Attitudes Toward Performance Appraisals." Personnel Psychology, Vol. XIX (1966), pp. 143-52.

Hackman, J. R., and Porter, L. W. "Expectancy Theory Predictions of Work Effectiveness." Organizational Behavior and Human Performance, Vol. III (1968), pp. 417-26.

Haire, M.; Guiselli, E. E.; and Porter, L. W. "Psychological Research on Pay: An Overview." Industrial Relations, Vol. III, No. 1 (1963), pp. 3-8.

Hall, D. T., and Nougaim, K. E. "An Examination of Maslow's Need Hierarchy in an Organizational Setting." Organizational Behavior and Human Performance, Vol. III (1968), pp. 12-35.

Harlow, H. F. "Mice, Monkeys, Men and Motives." Psychological Review, Vol. LX (1953), pp. 23-32.

Harrison, R. "Cumulative Communality Cluster Analysis of Workers' Job Attitudes." Journal of Applied Psychology, Vol. XLV (1961), pp. 123-25.

Hickson, D. J. "Motives of Workpeople Who Restrict Their Output." Occupational Psychology, Vol. XXXV (1961), pp. 110-21.

Hinrichs, J. R. "A Replicated Study of Job Satisfaction Dimensions." Personnel Psychology, Vol. XXI (1968), pp. 479-503.

_____. "Correlates of Employee Evaluations of Pay Increases." Journal of Applied Psychology, Vol. LIII (1969), pp. 481-89.

Homans, G. C. "Status Among Clerical Workers." Human Organization, Vol. XII (1953), pp. 5-10.

House, R. J., and Urgdon, L. A. "Herzberg's Dual-Factor Theory of Job Satisfaction and Motivation: A Review of the Evidence and a Criticism." Personnel Psychology, Vol. XX (1967), pp. 369-90.

Hulin, C. L. "Job Satisfaction and Turnover in a Female Clerical Population." Journal of Applied Psychology, Vol. L (1966), pp. 28-85.

_____, and Smith, P. C. "Sex Differences in Job Satisfaction." Journal of Applied Psychology, Vol. XLVIII (1964), pp. 88-92.

Kahn, R. L. "Productivity and Job Satisfaction." Personnel Psychology, Vol. XIII (1960), pp. 275-86.

Kaponya, P. G. "Salaries for All Workers." Harvard Business Review, Vol. XL, No. 3 (1962), pp. 49-57.

Klein, Stuart M. "Pay Factors as Predictors to Satisfaction: A Comparison of Reinforcement, Equity, and Expectancy." Academy of Management Journal, Vol. XVI, No. 4 (Dec., 1973), pp. 598-610.

Klugh, Henry E., and Maher, J. R. "Education Level and Satisfaction with Pay." Personnel Psychology, Vol. XIX, (1966), pp. 195-208.

Kuhlen, R. G. "Needs, Perceived Need Satisfaction Opportunities, and Satisfaction with Occupation." Journal of Applied Psychology, Vol. XLVII (1963), pp. 56-64.

Lawler, E. E. "Equity Theory as a Predictor of Productivity and Work Quality." Psychological Bulletin, Vol. LXX (1968), pp. 596-610.

_____. "Effects of Hourly Overpayment on Productivity and Work Quality." Journal of Personality and Social Psychology, Vol. X (1968b), pp. 306-14.

_____. "A Correlational-Causal Analysis of the Relationship Between Expectancy Attitudes and Job Performance." Journal of Applied Psychology, Vol. LII (1968a), pp. 462-68.

_____. "Review of 'Managerial Compensation.'" Personnel Psychology, Vol. XIX (1966d), pp. 237-39.

_____. "Managers' Attitudes Toward How Their Pay Is and Should Be Determined." Journal of Applied Psychology, Vol. L. (1966b), pp. 273-79.

Lawler, E. E. "Ability as a Moderator of the Relationship Between Job Attitudes and Job Performance." Personnel Psychology, Vol. XIX (1966a), pp. 153-64.

Lawler, E. E. "Managers' Perceptions of Their Subordinates' Pay and of Their Superiors' pay." Personnel Psychology, Vol. XVIII (1965a), pp. 413-22.

_____; Koplin, C. A.; Young, T. F.; and Fadem, J. A. "Inequity Reduction Over Time in an Induced Overpayment Situation." Organizational Behavior and Human Performance, Vol. III (1968), pp. 253-68.

Lawler, E. E., and O'Gara, R. W. "The Effects of Inequity Produced by Underpayment on Work Output, Work Quality, and Attitudes Toward the Work." Journal of Applied Psychology, Vol. LI (1967), pp. 403-10.

Leventhal, Gerald S., and Michaels, James W. "Extending the Equity Model: Perception of Inputs and Allocation of Reward as a Function of Duration and Quantity of Performance." Journal of Personality and Social Psychology, Vol. XII (1969a), pp. 303-309.

Leventhal, Gerald S., Weiss, Thomas and Long, Gary. "Equity, Reciprocity, and Reallocating Rewards in the Dyad." Journal of Personality and Social Psychology, Vol. XIII (1969b), pp. 300-305.

Lefcourt, H. M. "Internal Versus External Control of Reinforcement: A Review." Psychological Bulletin, Vol. LXV (1966), pp. 206-20.

Locke, E. A. "What is Job Satisfaction?" Organizational Behavior and Human Performance, Vol. IV (1969), pp. 309-36.

Lolordo, V. M. "Positive Conditioned Reinforcement from Aversive Situations." Psychological Bulletin, Vol. LXXII (1969), pp. 193-203.

Maslow, A. H. "A Theory of Human Motivation." Psychological Review, Vol. L (1943), pp. 370-96.

McArthur, C.; and Stevens, L. B. "The Validation of Expressed Interests as Compared with Inventoried Interests: A Fourteen-Year Follow-Up." Journal of Applied Psychology, Vol. XXXIX (1955), pp. 184-89.

Myers, M. S. "Who Are Your Motivated Workers?" Harvard Business Review, Vol. XLII, No. 1 (1964), pp. 73-88.

Opsahl, R. L., and Dunnette, M. D. "The Role of Financial Compensation in Industrial Motivation." Psychological Bulletin, Vol. LXVI (1966), pp. 94-118.

Porter, L. W. "Job Attitudes in Management: II. Perceived Importance of Needs as a Function of Job Level." Journal of Applied Psychology, Vol. LXVII (1963), pp. 141-48.

_____, and Lawler, E. E. "What Job Attitudes Tell Us About Motivation." Harvard Business Review, Vol. XLVI, No. 1 (1968b), pp. 118-26.

Pritchard, Robert D. "Equity Theory: A Review and Critique." Organizational Behavior and Human Performance, Vol. IV (1969), pp. 176-211.

Rodney, T. C. "Can Money Motivate Better Job Performance?" Personnel Administration, Vol. XXX, No. 2 (1967), pp. 23-29.

Ronan, W. W. "Relative Importance of Job Characteristics." Journal of Applied Psychology, Vol. LIV (1970b), pp. 192-200.

Roy, D. "Quota Restriction and Gold Bricking in a Machine Shop." American Journal of Sociology, Vol. LVII (1952), pp. 427-42.

Schneider, B., and Olson, L. K. "Effort as a Correlate of an Organizational Reward System and Individual Values." Personnel Psychology, Vol. XXIII (1970), pp. 313-26.

Schreiber, R. J.; Smith, R. G.; and Harrell, T. W. "A Factor Analysis of Employee Attitudes." Journal of Applied Psychology, Vol. XXXVI (1952), pp. 247-50.

Stagner, R. "Psychological Aspects of Industrial Conflicts: II. Motivation." Personnel Psychology, Vol. III (1950), pp. 1-16.

Stockford, L. O., and Kunze, K. R. "Psychology and the Pay Check." Personnel, Vol. XXVII (1950), pp. 129-43.

Svetlik, B.; Prien, E.; and Barrett, G. "Relationships Between Job Difficulty, Employee's Attitudes Toward His Job, and Supervisory Ratings of the Employee Effectiveness." Journal of Applied Psychology, Vol. XLVIII (1964), pp. 320-24.

Thibant, J. "An Experimental Study of the Cohesiveness of Underprivileged Groups." Human Relations, Vol. III (1950), pp. 251-78.

Tolman, E. C. "Purpose and Cognition: The Determiners of Animal Learning." Psychological Review, Vol. XXXII (1925), pp. 285-97.

Vroom, V. H. "Organizational Choice: A Study of Pre- and Postdecision Processes." Organizational Behavior and Human Performance, Vol. I (1966), pp. 212-25.

Weick, Karl E. "Reduction of Cognitive Dissonance through Task Enhancement and Effort Expenditure." Journal of Abnormal and Social Psychology, Vol. LXVIII (1964), pp. 533-39.

Weick, Karl E. "The Concept of Equity in the Perception of Pay." Administrative Science Quarterly, Vol. II (1966), pp. 414-39.

_____. "Dissonance and Task Enhancement: A Problem for Compensation Theory?" Organizational Behavior and Human Performance, Vol. II (1967), pp. 189-208.

_____, and Nesset, Bonna. "Preferences Among Forms of Equity." Organizational Behavior and Human Performance, Vol. III (1968), pp. 400-16

White, R. W. "Motivation Reconsidered: The Concept of Competence." Psychological Review, Vol. LXVI (1959), pp. 297-333.

Whitsett, D., and Winslow, E. K. "Analysis of Studies Critical of the Motivation-Hygiene Theory." Personnel Psychology, Vol. XX (1967), pp. 391-415.

Wiener, Yoash. "The Effect of Task and Ego-Oriented Performance on Two Kinds of Over-Compensation Inequity." Organizational Behavior and Human Performance, Vol. V (1969), pp. 191-209.

_____. "Performance Orientation and Overcompensation." Organizational Behavior and Human Performance, Vol. V (1970), pp. 191-208.

Wood, I., and Lawler, E. E. "The Effect of Piece-Rate Overpayment on Productivity." Journal of Applied Psychology, Vol. LIV (1970), pp. 234-38.

Zeaman, D. "Response Latency as a Function of the Amount of Reinforcement." Journal of Experimental Psychology, Vol. XXXIX (1949), pp. 466-83.

Zedeck, S., and Smith, P. C. "A Psychophysical Determination of Equitable Payment: A Methodological Study." Journal of Applied Psychology, Vol. LII (1968), pp. 343-47.

Miscellaneous

Arrowood, A. J. "Some Effects on Productivity of Justified and Unjustified Levels of Rewards under Public and Private Conditions." Unpublished Doctoral Dissertation, University of Minnesota, 1961.

King, Clyde L. "The Annals." Psychology in Business, Vol. CX, (November, 1923).

Organization for Economic Co-Operation and Development. "Forms of Wage and Salary Payment for High Productivity." International Seminars, Versailles 26-29, (Sept., 1967).

Robinson, John P.; Athanasion, Robert and Head, Kendra B. "Measures of Occupational Attitudes and Occupational Characteristics." Ann Arbor, Michigan: Institute for Social Research, 1969.

Valenzi, E. R., and Andrews, I. R. "Effect of Underpay and Overpay Inequity When Tested with a New Induction Procedure." In Proceedings, 77th Annual Convention: 593-594. Washington, D. C.: American Psychological Association.