

EXAMINING THE EFFECT OF EVALUATING PERFORMANCE
WITH PERFORMANCE REPORT VARIANCES ON REPORTED PERFORMANCE:
A FIELD RESEARCH APPROACH

by

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(ABSTRACT)

Past research in accounting has suggested that the use of budgets, for performance evaluation purposes, may result in either functional or dysfunctional behavior.

This study unlike those of the past utilizes a theoretical model. The theoretical model, developed from a synthesis of prior research, presents the path-goal relationships that may be expected to exist as related to the use of performance report variances.

The study was conducted using a field research approach involving interviews, observation, and questionnaires. The organizations which participated in the study were members of the furniture industry, and each organization was treated initially as an individual case study.

The results of the study suggest that there is a positive relationship between the accepted use of performance reports, strong pay-performance linkage, and agreement regarding performance ratings.

A major limitation of this study was the small number of respondents on the negative path. As a result, little can be said regarding the generalizability of the negative path individuals' responses. Additionally, some of the comparisons between supervisors' perceptions and subordinates' perceptions had to be done visually since no statistical technique to my knowledge exists to compare observations that are not independent.

A major contribution of this research is the development of a theoretical model of the expected behavior of managers who are evaluated using performance report variances. As a result of this study future researchers may be able to employ this model as it is or expand and modify it to further explore the relationships between management accounting performance evaluation techniques and expected behavior.

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Finally, to my Chairman, Dr. Larry Killough, a special word of thanks is necessary. He was always very supportive of the research approach taken in this study as well as its use of material outside of the accounting area. Without his help and support this project would never have been started or completed.

I dedicate this dissertation to my daughter, _____, who put up with and supported me through the long process of completing the Ph.D. program and to my parents,

_____ who also provided morale and financial support.

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CHAPTER I- RESEARCH SUMMARY AND INTRODUCTION

Introduction

Past research in accounting has suggested that the use of budgets, for performance evaluation purposes, may result in either functional or dysfunctional behavior.¹ Although prior research has given some indication of the types of attitudes that may result from budget use in performance evaluation very little is known regarding the effect on actual performance.

To overcome some of the problems associated with prior research in the area this study utilizes a theoretical model. The theoretical model, developed from a synthesis of prior research, presents the relationships that may be expected to exist as related to the use of management accounting performance evaluation techniques. Although there exist a variety of organizational control mechanisms, the primary focus of this research is the use of accounting data for control purposes. In particular, this study will

¹ Hopwood, A. "An Empirical Study of the Role of Accounting Data in Performance Evaluation." *Journal of Accounting Research Supplement*, 10, 1972, 156-182; Otley, D. "Budget Use and Managerial Performance." *Journal of Accounting Research*, 16, 1978, 122-149; Brownell, P. "The Role of Accounting in Performance Evaluation, Budgetary Participation and Organizational Effectiveness." *Journal of Accounting Research*, 1982, 12-27.

concentrate on the use of performance report variances, and their impact on attitudes, motivation, and in turn performance.

The model was constructed based on previous research findings in the organizational behavior area regarding control systems, and accounting research regarding budgeting reactions and attitudes. The model indicates that individuals should be expected to form positive or negative attitudes regarding the equitability of the performance report. As a result, individuals will perceive the performance report to be instrumental or non-instrumental in terms of improving performance and increasing their reward (defined in this study primarily as pay).

If the performance report is deemed instrumental then the individual should perceive a positive path-goal relationship between performance and reward. On the other hand, if the performance report is deemed non-instrumental the individual should perceive a negative path-goal relationship between performance and reward. That is, the reward cannot be increased by improving performance via the performance report. In this instance individuals are expected to divert their attention from performance, as measured by the performance report, to areas where they believe they can increase performance and in turn their reward.

The study was conducted using a field research approach involving interviews, observation, and questionnaires. The organizations which participated in the study were members of the furniture industry, and each organization was treated initially as an individual case study.

Findings

Several of the hypotheses, which related to contingent variables which might affect path-goal perceptions were not supported by the results. The other hypotheses (path-goal perceptions and pay-performance linkage) and visual inspection of the data seems to indicate that there is a relationship between the perceived positive path and agreement between superiors and subordinates regarding performance rankings. Additionally, these research findings also confirm and support some of the conclusions drawn in earlier research. Although Hopwood found that budget evaluations resulted in poor relations between superiors and subordinates, low goal congruity, and a misunderstanding of the importance of the evaluation this study found just the opposite.

With respect to Otley's findings this study also tends to confirm the notion that the use of performance reports enhances communication and promotes functional behavior. Although Otley indicated that managers did not agree

regarding how they were evaluated this study found just the opposite. The findings in this study also tend to support Brownell's finding that increased emphasis on budget evaluation, or in the case of this study the performance report variances, resulted in increased satisfaction with the performance measure.

Outline of Research

First a statement of the research problem, issues regarding prior research, and the purpose of this research are addressed in Chapter Two. Next a review of the relevant literature and the development of a theoretical model, as well as its implications for the use of performance reports is presented in Chapter Three. Since this research involves a field study, an extensive discussion of field research design is contained in Chapter Four along with the research questions and statistical hypotheses developed from the theoretical model. Lastly, Chapter Five provides the research results, and Chapter six contains a discussion of the results along with concluding remarks and limitations.

CHAPTER II- NATURE OF THE RESEARCH PROBLEM

Introduction

In recent years a number of American businesses have lost their competitive edge in world markets. A major reason for this is declining productivity. Hayes and Abernathy have summed up the American productivity problem by suggesting that;

Responsibility for this competitive listlessness belongs not just to a set of external conditions but also to the attitudes, preoccupations and practices of American managers. By their preference for servicing existing markets rather than creating new ones and by their devotion to short-term returns and management by numbers, many of them have effectively forsworn long-term technological superiority as a competitive weapon. In consequence, they have abdicated their strategic responsibilities.²

Hayes and Abernathy's suggestion that part of American management's problem is managing by the numbers raises the question of management accounting's role in the performance problem.

In the past, substantial research effort has been devoted to providing management with more sophisticated information by expanding the analytical ability of management accounting, i.e., providing "better" numbers.

² Hayes, R., and W. Abernathy. "Managing Our Way to Economic Decline." Harvard Business Review, July-August, 1980, 70.

Unfortunately, the role these numbers play in the organization has received only limited attention, and as a result little is known regarding the effect of management's application of the numbers on organizational performance.

The Role Ascribed to Management Accounting

An overall role ascribed to management accounting is, however, implied by the following definition:

The process of identification, measurement, accumulation, analysis, preparation, interpretation, and communication of financial information used by management to plan, evaluate, and control within an organization and to assure appropriate use and accountability of its resources.³

This definition appears to have been, at least in part, influenced by theories from the general area of management control. Management control according to Anthony can be summarized as

the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's goals.⁴

The striking similarity between management control and management accounting theory is particularly evident in Lowe's definition of a management control system:

³ National Association of Accountants, Statements on Management Accounting, Statement Number 1A, New York, New York, National Association of Accountants, March 19, 1981.

⁴ Anthony, R. Planning and Control Systems: A Framework for Analysis. Boston, Massachusetts, Harvard University, 1965.

a system of organizational information seeking and gathering, accountability and feedback designed to ensure that the enterprise adapts to changes in its substantive environment and that the work behavior of its employees is measured by reference to a set of operational sub-goals (which conform with overall objectives) so that the discrepancy between the two can be reconciled and corrected for ⁶

The National Association of Accountants' definition of management accounting has incorporated these notions of management control and management control systems, since one of its stated purposes is to provide management with a means to efficiently organize the use of all resources. In fact, the control function of management accounting is described as "... monitoring and measuring performance and inducing any corrective actions required to return the activity to its intended course."⁶ This definition of management accounting implies that human, as well as material resources, may be controlled effectively by the same numbers.

Foundational concepts of management accounting, however, are grounded in Taylor's approach to "scientific management"⁷ which views human beings in line with

⁶ Lowe, E. "On the Idea of a Management Control System." *Journal of Management Studies*, February 1971, 1-12.

⁶ National Association of Accountants, op. cit., 1981.

⁷ Taylor, F. The Principles of Scientific Management, New York, New York, Harper Publishers, 1911.

McGregor's Theory X,⁹ that is, man is lazy and will not work unless forced to do so. Performance evaluation, using management accounting techniques, reinforces this notion through the use of budgets and variance analysis. Research, however, on attitudes toward budgets seems to indicate that labor is more satisfied when it participates in the budgeting process, and budgets which are merely handed down create conflict.⁷ The strategies used to "outwit" the budgeting process are well documented and include manipulation, intentional errors, highlighting and a general phenomenon referred to as gaming.¹⁰ The findings regarding reactions to budgeting have implications for performance evaluation using management accounting techniques, such as the performance report, since the budget is the first step in the process.

Suggestions offered regarding the improvement of management accounting techniques aimed at making them more applicable to present problems, however, have basically looked for new or more sophisticated techniques without assessing the underlying problem which may be inherent in

⁹ McGregor, D. The Human Side of Enterprise, New York, New York, McGraw-Hill, 1960.

⁷ Schiff, M. and A. Lewin. "The Impact of Budgets on People." *The Accounting Review*, 45, 1970, 259-268.

¹⁰ Birnberg, J., L. Turpolec, and S. Young. "The Organizational Context of Accounting." *Accounting, Organizations and Society*, 8, 1983, 111-129.

the philosophy of management accounting. The fundamental notion that is repeatedly ignored is that management accounting data is provided to people by people and as such is affected by and affects its human counterparts.

To date the effect of management accounting performance evaluation techniques on the recipient's actual performance has not been researched. The general concept of organizational control and its affect on performance, however, has been studied extensively by organizational behavior researchers. Research in this area has focused, for example, on areas such as bureaucratic structure, leadership behavior, participation, task complexity, types of feedback, types of power exerted, locus of control, job satisfaction, and internal/external environment. Although these studies have not looked at accounting, the findings may provide some important insights into the question of whether or not management accounting performance evaluation techniques result in dysfunctional behavior within the organization and in turn decreased labor performance.

Most organizational researchers acknowledge that the process of control involves assessing the achievement of organizational goals, promoting efficiency and facilitating predictability.¹¹ Reflecting on these components, espoused

¹¹ McNeil, K. "Understanding Organizational Power: building on the Weberian legacy." *Administrative Science Quarterly*, 23, 1978, 65-90; Otley, D., op. cit., 1978.

for a control process and the definition of management accounting, would seem to indicate that management accounting is a prime candidate for research in terms of organizational control and its affect on performance.

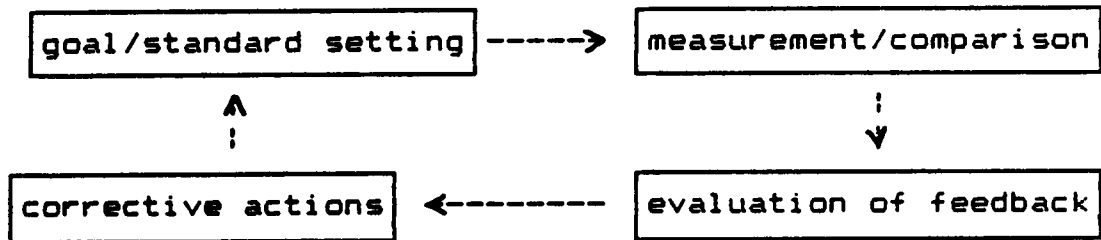
Management Accounting's Role in Organizational Control

In order to manage efficiently and achieve maximum performance it seems reasonable to consider control, in the organization, as a primary issue. The term control, however, has various connotations. It may infer choosing operating and enforcement rules which attempt to maximize a firm's objective function, or verifying and confirming actions to plans and directives, or prescribing interpersonal influence activities.¹² Additionally, control has been equated with structure, power and behavior. Regardless of the interpretation of control, it is considered to be a mechanism by which some predetermined goal is brought about.

Organizational control is the process by which the behavior of members in the organization is influenced. The principal reason for a control process or control mechanism is to facilitate assessing the achievement of goals or

¹² Flamholtz, E., T. Das and A. Tsui. "Toward an Integrative Framework of Organizational Control." *Accounting, Organizations and Society*, 10, 1985, 35-50.

forecasting to enhance predictability.¹³ The control process results in the following sequence:¹⁴



The application of management accounting techniques to the organization provides for such a sequence. The budget provides the goal/standard and the accounting system accumulates the actual production costs and then compares these to the budget. The result of this comparison is a performance report which presents variances (feedback). The variances provide an evaluation of actual performance in relation to expected (budgeted) performance and this report is used by management to correct problem areas.

The purpose of the control sequence is to promote effective performance, that is, appropriate (expected/budgeted) behavior. Feedback is a major source of information regarding work behaviors and the resultant

¹³ McNeil, K., op. cit., 1978; Otley, D., op. cit., 1978.

¹⁴ Flamholtz, E., T. Das, and A. Tsui., op. cit., 1985.

outcomes. Feedback may be used as a control mechanism in two ways. It may function to direct behavior toward the appropriate work role or motivate performance through the promise of future rewards.¹⁸

Duchi and McGuire suggest that organizations can exercise control by using feedback on either outcomes or behavior. Additionally, to reinforce appropriate performance behavior rewards provided may be either extrinsic or intrinsic. Extrinsic rewards are given by the organization after the individual has achieved the desired outcome. Intrinsic rewards, on the other hand, are experienced by the individual outside the organization's formal reward system.¹⁹

Management accounting produces feedback based on readily quantifiable outcomes rather than on worker behavior in order to evaluate performance. This feedback has been used, for the most part, as a basis for providing extrinsic rewards. Thus, performance evaluation, under management accounting techniques, measures only one of the types of feedback and offers only one of the two important rewards for effective performance.

The information system is an integral part of the

¹⁸ Ibid.

¹⁹ Duchi, W. and M. McGuire "Organizational Control: two functions." *Administrative Science Quarterly*, December, 1975, 559-569.

environment and as such communicates information that is the result of producers' and users' perceptions of reality.¹⁷ Thus, the implementation and use of management accounting as a control system which ignores human behavior may lead to inappropriate member behavior. If so, the process is dysfunctional and cannot be used to promote effective performance.

The primary emphasis in the development of management accounting theory has focused on measuring objectives or measuring progress toward them, rather than the development of predictive models for expected behavior and performance.¹⁸ As a result the role of management accounting, in particular management's use of it, has been explored only to a limited extent.

Although management accounting's role, as defined by the National Association of Accountants, only alludes to the behavioral aspects of applying accounting numbers, some researchers have suggested that management accounting is a primary tool for employee socialization in the

¹⁷ Birnberg, J., L. Turpolec, and S. Young., op. cit., 1983.

¹⁸ Otley, D. and A. Berry. "Control, Organisation and Accounting. Accounting, Organizations and Society, 5/2, 1980, 240.

organization.¹⁹ That is, management uses the budget to prescribe normative behavior (expected performance) and then evaluates the actual performance and bases rewards on performance relative to the budget (performance report). This application implies that management perceives management accounting to be a social control mechanism which can be used to improve performance. The ability of management accounting data, however, to effectively motivate individual performance has not been substantiated due to conflicting research findings.

Budget Evaluation and Attitudes

The results of Hopwood, Otley, and Brownell's studies suggest that management should be careful in attempting to use management accounting data as a social control mechanism. Although traditional budgeting theory has suggested that the budget may be used to promote organizational goal congruence,²⁰ Hopwood, Otley and

¹⁹ Collins, F. "Managerial Accounting, Systems and Organizational Control: a role perspective." *Accounting, Organizations and Society*, November 1982, 107-122; Ronen, J. and J. Livingstone. "An Expectancy Theory Approach to Motivational Impacts of Budgets." *The Accounting Review*, October 1975, 671-685.

²⁰ Killough, L. and W. Leininger, Cost Accounting- Concepts and Techniques for Management, New York, New York, West Publishing Company, 1987; Horngren, C. Cost Accounting- A Managerial Emphasis, Englewood Cliffs, New Jersey, Prentice-Hall, 1982.

Brownell's findings indicated that, in some instances, the budget results in reduced goal clarity, increased job ambiguity, and increased tension between superiors and subordinates.²¹

Hopwood, Otley and Brownell's research findings also suggest the existence of a communication problem with respect to the budget, i.e., that subordinates and superiors are not in agreement regarding how the budget is used for performance evaluation purposes. The ability of the budget to function as a motivator toward expected performance is also questionable, since Hopwood and Brownell's studies indicate that decreased budget emphasis is related to higher performance, while Otley's indicates the opposite.

The conflicting findings from Hopwood, Otley and Brownell's studies may, however, have resulted from methodological problems and may not be an indication of true differences. Since so many differences exist between these three researchers' studies Figure 1, on the following page, was constructed in an attempt to isolate methodological similarities and differences.

²¹ Hopwood, A., op. cit., 1972; Otley, D., op. cit., 1978; Brownell, P. "The Role of Accounting in Performance Evaluation, Budgetary Participation and Organizational Effectiveness," 1982.

	<u>Hopwood</u>	<u>Otley</u>	<u>Brownell</u>
subjects	U.S. cost center manufacturing managers	English profit center manufacturing managers	U.S. cost center manufacturing managers
budget use	10 years-well accepted	used a number of years	NA
job-related tension	Kahn measure	ISR measure	NM
cost tension	self developed measure	NM	NM
supervisor relations	LBDQ	NM	NM
performance evaluation criterion	self developed measure, what is? what should be?	Hopwood's measure plus perceived vs. intended style	NM
budget manipulation	interview information	interview information	NM
goal clarity	Do you know what is expected of you in your job?	Kahn- job ambiguity measure	NM
trust	NM	Read measure	NM
performance	NM	Mean % budget error	Mahoney-self-rated
participation	NM	NM	Hofstede and Milani
job satisfaction	NM	NM	MSQ

LBDQ (Leadership Behavior Description Questionnaire)
MSQ (Minnesota Satisfaction Questionnaire)
NA Not available
NM Not Measured

FIGURE 1
METHODOLOGY COMPARISON CHART

Brownell appears to have used the measure of job satisfaction as a surrogate for several variables measured by Hopwood and Otley using different instruments. Additionally, all three researchers obtained their measures of performance in a different manner. Hopwood defined performance in terms of interpersonal relations, Otley used a mean percentage of the budget error, and Brownell used a measure of self-reported performance. Since Otley's research was an attempt to replicate Hopwood's findings and Brownell's research was intended to reconcile the conflicting findings between Hopwood and Otley's studies Figure 1 suggests some interesting questions;

- 1.) Can supervisor relations be equated with trust and in turn job satisfaction?
- 2.) Is goal clarity equal to job ambiguity?
- 3.) Are feelings and beliefs (intended performance) equal to self-reported performance and/or actual performance?
- 4.) Is job satisfaction equal to job related tension?
- 5.) Does participation allow budget manipulation?

Additionally, all three researchers seem to equate leadership style with the use of budget data (high or low use). Unfortunately perceived leadership style will incorporate many other factors, one of which may be the degree to which accounting data is used. Thus, it may be likely that the effect of using budgetary data was not

adequately isolated. Furthermore, the use of the term budget may have been too global a concept since perceptions regarding it are based not only on its use but also its preparation. In an attempt to overcome the difficulty associated with the term "budget" this research will focus on the performance report.

Neither Hopwood, Otley nor Brownell provide a theoretical model of the organizational relationships that could be expected to exist and the outcomes of these relationships. Instead, the relationships under study were described in a very general manner. As a result their hypotheses tended to be stated in vary general terms and may not have provided the basis necessary for rigorous analysis of the various relationships. Their hypotheses were as follows:

Hopwood- If a cost center head perceives that he is evaluated on the basis of a Budget Constrained style he is

- (a) more likely to experience job related tension,
- (b) more likely to report having poor relations with his supervisor,
- (c) more likely to report having poor relations with his peers,
- (d) more likely to engage in falsification of the accounting data and dysfunctional decision making,

than if he perceives that he is evaluated on the basis of

either a Profit Conscious or a Non-accounting style.²²

Otley- When a manager perceives that he is evaluated primarily on his ability to meet his budget (rather than on the basis of a more flexible use of budgetary information), he is more likely to

- (a) experience job-related and budget related tension
- (b) distrust his superior
- (c) be clear about how his performance is evaluated
- (d) consider his evaluation to be unfair

His response to such feelings will be such that he is more likely to

- (e) bias his budget estimates by building in "slack" so the budget is easier to attain
- (f) have a short-term view of his job in that his performance measure is short-term
- (g) perform poorly, particularly on those aspects of performance which yield only long-term benefits.²³

Brownell-

- (a) There is no significant interaction between supervisory evaluative style and budgetary participation affecting performance.
- (b) There is no significant interaction between supervisory evaluative style and budgetary participation affecting job satisfaction.²⁴

²² Hopwood, A., op. cit., 1972, 163.

²³ Otley, D., op. cit., 1978, 126.

²⁴ Brownell, P. "The Role of Accounting Data in Performance Evaluation, Budgetary Participation, and Organizational Effectiveness," 1982, 14-15.

Although Hopwood and Otley's hypotheses are similar, Brownell's are quite different. This is particularly disturbing since Brownell's work was an attempt to reconcile the conflicting results of Hopwood and Otley's studies.

Purpose of the Research

In view of the differences regarding subjects, hypotheses, variables, and instruments it seems plausible that these factors caused the conflicting results rather than the phenomenon under study. To overcome some of the prior difficulties associated with this research area, a theoretical model of the expected relationships and their outcomes was developed. Additionally, information regarding the variables of interest was gathered with instruments which have previously demonstrated reliability and validity, in field tests, conducted in the organizational behavior area.

CHAPTER III- DEVELOPMENT OF A THEORETICAL MODEL- LITERATURE REVIEW

Introduction

Perhaps one reason that prior research in the area of attitudes toward budgeting produced inconclusive or conflicting findings may have been due to the researchers' failure to adequately specify the organizational relationships that could be expected to exist. To overcome this problem and provide a theoretical basis for exploring the relationship between management accounting performance reports and actual performance a theoretical model (Figure 2, p. 23) was developed. The model evolved during a review and summary of the organizational behavior and accounting literature regarding control and individuals' reactions to control discussed in this chapter.

Relationships A, B, and C shown in the complete theoretical model, will not be tested since these relationships exist in one form or another and are generally understood by researchers and management. These relationships will be discussed, however, since an understanding of these contingent variables, in each organization studied, could play a crucial role in the interpretation of the research findings and the conclusions

drawn. Next the remaining components of the model, along with the relevant literature, will be reviewed and the implications for this research examined.

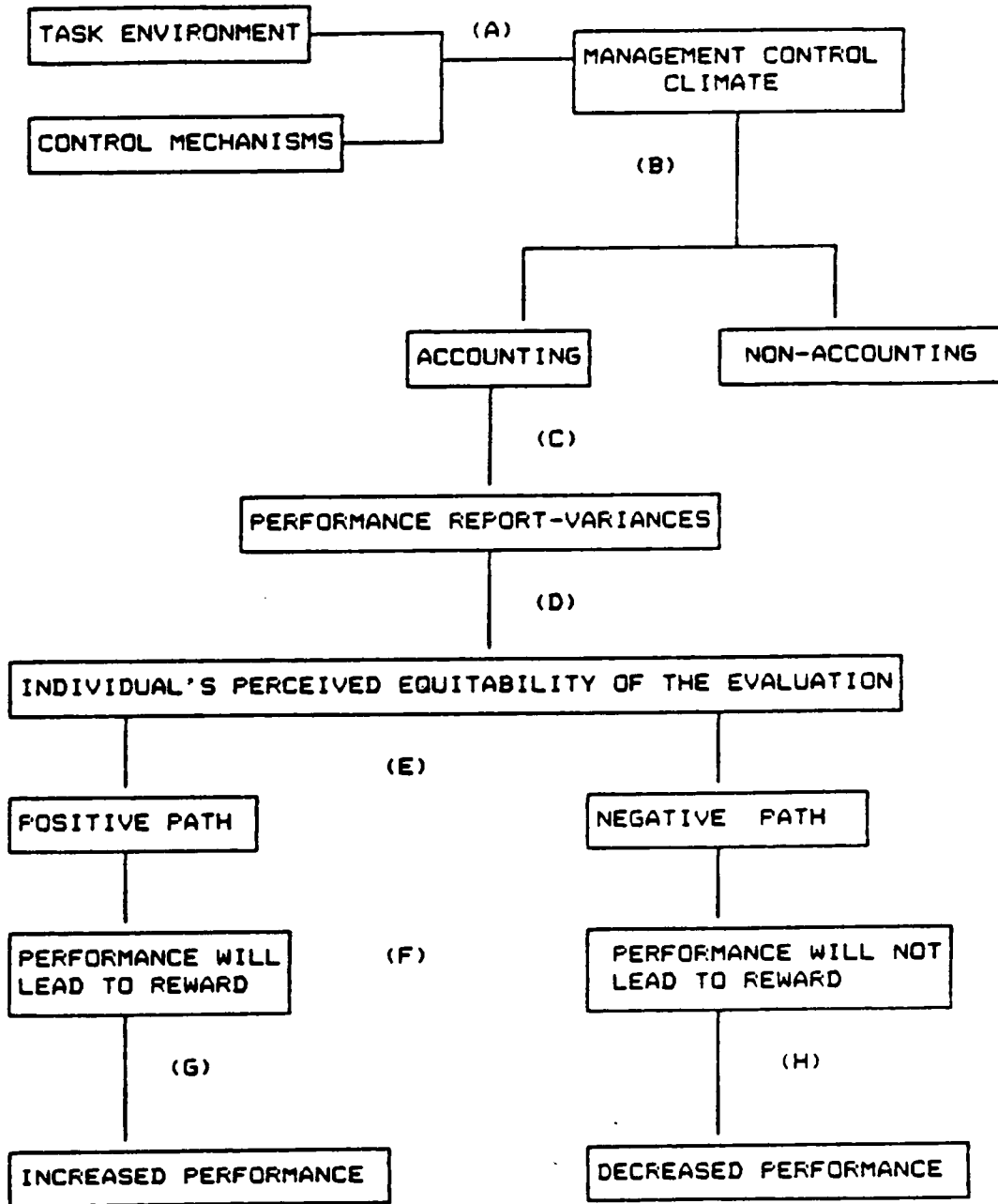
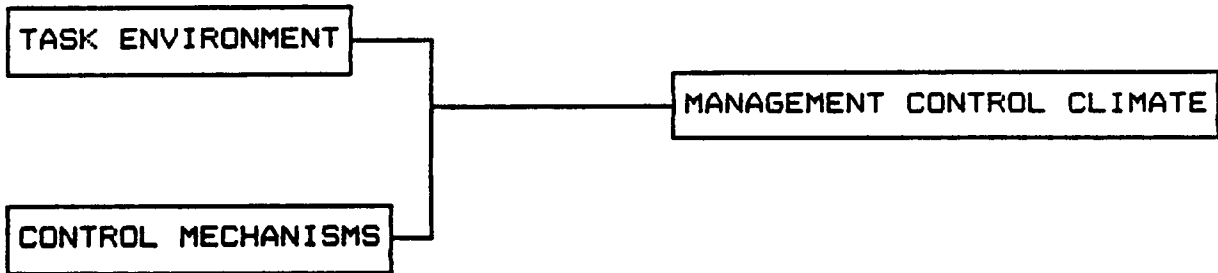


FIGURE 2
THEORETICAL MODEL

RELATIONSHIP A

**Overview**

The management control climate will be affected by the organization's external and internal environment and the control mechanisms adopted by the organization. As the environment becomes more complex the organization will adopt various strategies which are aimed at reducing environmental uncertainty and complexity. The control strategies adopted will, in turn, affect the type of management control climate which is perceived by organizational members.

Environment

As the environment becomes more complex an organization must adjust its organizational and control structure in an attempt to maintain its effectiveness. Thus, understanding the type of control system which an organization employs requires a consideration of the internal and external environment. The environment may be broken down into three

major categories, macro, aggregation and task.

The macro environment consists of the general culture found in a specific geographic location. The cultural forces which act upon the organization, and in turn influence its characteristics and outputs, involve economic, education, legal-political, and socio-cultural factors. The aggregation environment refers to the associations, interest groups and constituencies operating within the given macro environment. The task environment pertains to the environment that is relevant for goal setting and attainment.²⁵ Although this study is primarily concerned with the internal environment and specifically the task environment, general information regarding the external environment will be collected for interpretation purposes.

Control

Katz and Kahn have suggested that organizational structure may be differentiated based on the part the organization plays in larger society and their input/output design or pattern.²⁶ The development of an internal control structure or mechanism, in addition to the basic

²⁵ Osborn, R. and J. Hunt. "Environment and Organizational Effectiveness." *Administrative Science Quarterly*, 19, 1974, 231-246.

²⁶ Katz, D. and R. Kahn. The Social Psychology of Organizations, New York, New York, Wiley Publishers, 1966.

organizational structure, is also an attempt to rationally deal with internal and external uncertainty associated with the input/output design, i.e, the achievement of organizational goals.

Achieving organizational goals requires that individuals come together in a prescribed exchange relationship. The organization's role is to provide inducements and the employee's role is to contribute to the organization's goals through participation and production. The organizational structure by itself, however, will not suffice to insure organizational effectiveness; what is required is that members behave in a manner that is supportive of organizational goals.²⁷ As Tannenbaum suggests, control is achieved by influencing behavior.²⁸

In order to control or influence member behavior, organizations adopt mechanisms which will promote adaptation and/or domination. The ability to dominate and/or adapt is usually facilitated through internal bureaucratization.²⁹ Internal bureaucratization provides a structure which enables the organization to be monitored and coordinated,

²⁷ Angle, H. and J. Perry. "Empirical Assessment of Organizational Commitment and Organizational Effectiveness." *Administrative Science Quarterly*, 26, March 1981, 1-14.

²⁸ Tannenbaum, A. Control in Organizations, New York, New York, McGraw-Hill, 1968.

²⁹ McNeil, K., op. cit., 1978.

facilitating the collection and analysis of feedback allowing management to react to change.³⁰ Internal bureaucratization generally involves implementing structures of routinization which employ prevention devices and/or information collection techniques.³¹ Prevention devices are based on the notion of establishing "norms of performance"³² and then enforcing those norms of performance through information collection techniques (feedback).

Organizational routinization of behavior is promoted through strategies of bureaucratization and centralized decision making. The organization's choice regarding the use of a variety of control strategies will reflect its prevention and information style of operating rationale. The operating rationale is to provide a "norm" for behavior which is implemented and maintained through routinization and feedback. As Child's research indicated these strategies will be evidenced by formalization, standardization and centralization. When high values are assigned to these characteristics by the organization, there

³⁰ Otley, D. and A. Berry, op. cit., 1980.

³¹ Hickson, D., C. Hinings, C. Lee, R. Schneck, and J. Pennings. "A Strategic Contingency Theory of Intraorganizational Power." *Administrative Science Quarterly*, 16, 1971, 216-229.

³² McNeil, K., op. cit., 1978.

is a tendency to increase the degree of role prescription,³³ i.e., norms of performance.

Depending on the degree of bureaucratization and centralization of decision making adopted by the organization its control structure may be considered primarily a tight monitoring system, which has also been referred to as type A monitoring system, or a Type Z monitoring system which controls through acculturation or socialization. Research by Ouchi and Johnson indicated that organizational members under Type A monitoring systems experienced higher rates of turnover, lower levels of mental health and weaker attachments to the organization than members in organizations which used Type Z monitoring systems. Executives in organizations who used Type A monitoring systems also tended to experience more anomie and to be more specialized than their counterparts in organizations who used Type Z monitoring systems.³⁴

Hrebiniak's research also indicated that when a supervisor perceived the control process to be tight he was more likely to rely on formal control, closer supervision, and increased use of rules which resulted in decreased

³³ Child, J. "Strategies of Control and Organizational Behavior." *Administrative Science Quarterly*, 18, March 1973, 1-17.

³⁴ Ouchi, W. and J. Johnson. "Types of Organizational Control and their Relationship to Emotional Well Being." *Administrative Science Quarterly*, 23, June 1978, 293-317.

worker autonomy and participation. Additionally, the greater the exercise of external control over the manager the more his subordinates perceived ambiguity regarding his locus of and legitimacy of control.³⁸

Implications for Management Accounting Control

Organizational and control structures are developed to help the organization achieve some specific goals. In order to achieve its goals the organization attempts to promote goal congruency and reduce the uncertainty of behavior amongst the organizational members through routinization. A synthesis of the foregoing research indicates that control mechanisms will develop within the organization which reflect the organization's method of collecting information and preventing inappropriate behavior. To produce norms of behavior organizations routinize work through formalized rules and standardization, and to assure that labor conforms to the prescribed behavior the organization must develop surveillance systems to monitor actual performance.

Routinization, on the other hand, places increasing emphasis on role specification which tends to encourage high degrees of standardization, specialization, formalization

³⁸ Hrebiniak, L. "Job Technology, Supervision, and Work-Group Structure." *Administrative Science Quarterly*, 19, 1974a, 395-410.

and centralization of authority. For management accounting to provide the required feedback on segments/departments/processes of the organization, each unit must be clearly differentiated in terms of responsibilities (span of control) and goals. This requirement will lead to more formalization and role specification. As research indicates, however, formalization and specification are more applicable to certain environments than they are to uncertain environments. Additionally, interdependencies may exist between units which affect performance; however, management accounting tends to stratify the organization into identifiable segments as if no interdependencies existed.

The structure by itself, nevertheless, will not control behavior, i.e., promote effective performance. Controlling performance requires a mechanism which collects actual performance feedback data and then compares it against a standard, a norm of performance.³⁶

The management accounting process provides a surveillance system which is linked with the performance

³⁶ Child, J., op. cit., 1973; Conlon, E. "Feedback About Personal and Organizational Outcomes and its Effectiveness on Persistence of Planned Behavior Changes." *Academy of Management Journal*, 23, June 1980, 267-286.

evaluation system, a requirement for effecting behavior.³⁷ The collection of feedback provides the organization with the ability to monitor the progress toward its goals and react to changes which are not in line with its goals. The major role management accounting plays in the organization is providing feedback which is evaluative in nature. Its ability to provide information which will allow management to predict, thus reducing future uncertainty, is dependent upon the nature of the task it is asked to monitor.

Management accounting produces relatively standardized performance evaluation information in terms of budget vs. actual performance. The task environment, however, may not always be easily standardized or predictable. Management accounting appears to be best suited to monitoring tasks which are predictable and have relatively certain environments. The effectiveness of management accounting in evaluating a task should thus be dependent upon the task's certainty and predictability. The more certain, predictable or standardized the better management accounting will be able to accurately evaluate the task. The fit between the task and management accounting techniques' ability to evaluate the task should affect the recipient's perceptions regarding the equitability of the performance evaluation.

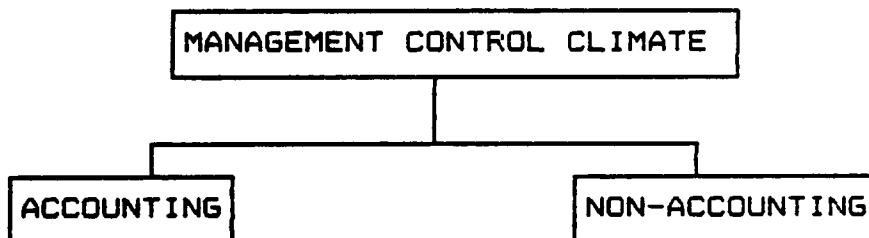
For example, the performance report will show actual

³⁷ McNeil, K., op. cit., 1978.

performance minus budgeted performance. The primary focus of management in using variances is to reward the manager for non-negative variances and to punish him for negative variances. Unfortunately, as prior research indicates negative feedback tends to be rejected more often than positive feedback.³⁰

The management accounting process would appear to promote both a tight monitoring system and allow increasing amounts of external control to be exerted. Prior research, however, indicated that tight monitoring systems and increases in external control resulted in subordinates questioning their leader's locus and legitimacy of control, as well as decreased attachment to the firm.

RELATIONSHIP B



³⁰ Foran, M. and D. DeCoster. "An Experimental Study of the Effects of Participation, Authoritarianism and Feedback on Cognitive Dissonance in a Standard Setting Situation." *The Accounting Review*, 1974, 751-763.

Overview

Etzioni maintains that organizations are social units deliberately constructed to seek specific goals.³⁹ Thus, the management control climate constructed in an organization will reflect the characteristics of the organization as a whole, as well as its operating rationale, to bring about specific goals.

The various general characteristics of the organization which might affect the type of management control climate may involve the size of the organization, the degree of centralization of decision making, and the type of bureaucratization. Additionally, the particular management control climate may vary according to the organizational level, and may involve the use of accounting or non-accounting types of control mechanisms.

Management Control Climate

The management control climate will vary depending on the extent to which the organization employs two strategies of administrative control: bureaucratization and centralized decision making. The main characteristics associated with bureaucratization are size and the extent of work integration while concentration of authority is largely

³⁹ Etzioni, A. A Comparative Analysis of Complex Organizations, New York, New York, Free Press, 1961.

associated with dependence. Additionally, when organizations place high values on structuring techniques such as specialization, standardization, formalization, and centralization, they tend to increase the amounts of role prescription and specificity,⁴⁰ i.e., make the control climate tighter.

Fugh, Hickson, Hinings, and Turner also found that large organizations tended to have more specialization, standardization and formalization. There was no relationship, however, between size and concentration of authority and autonomy. Although centralization of authority was related to the age of the organization and its public accountability. Furthermore, there was a negative relationship between size and centralization, and a positive relationship with standardization of procedures for selection and advancement.⁴¹

Whether the organization's hierarchical structure is flat or tall may also affect the extent to which bureaucratization and/or centralization of decision making are employed for control which, in turn, will affect the management control climate. Ivancevich and Donnelly found

⁴⁰ Inkson J., D. Fugh and D. Hickson. "Organizational Context and Structure: an abbreviated replication." *Administrative Science Quarterly*, 15, 318-329.

⁴¹ Fugh, D., D. Hickson, C. Hinings, and C. Turner. "The Context of Organizational Structures." *Administrative Science Quarterly*, 14, 1969, 91-114.

that tall hierarchical structures resulted in more job specialization, lower morale, lower output, and less innovation while flat hierarchical structures resulted in more efficiency and better performance. Additionally, tall hierarchical structures provided for security and social needs, and flat hierarchical structures tended to foster autonomy and self-actualization satisfaction.⁴²

Organizational Level Characteristics

The analysis of management climate also requires considering how the conditions and practices at one level in the hierarchy effect those at other levels. Since influence flows down through the organization it will require time for the upper level directives to effect the lower levels in the organization. As Bowers suggests the objectives, policies, decisions, and directives are the end result of upper echelon groups and it is these results which comprise the management climate.⁴³

The general management climate may be assessed in terms of four factors which represent the organizational conditions and practices-- organizational climate,

⁴² Ivancevich, J. and J. Donnelly. "Relation of Organizational Structure to Job Satisfaction, Anxiety-Stress, and Performance." *Administrative Science Quarterly*, 20, June 1975, 272-280.

⁴³ Bowers, D. System 4: The Ideas of Rensis Likert. Ann Arbor, Michigan, University Press, 1975.

management leadership, peer leadership, and group process.⁴⁴ A major determinant of managerial leadership behavior is the organizational climate and a major determinant of peer leadership is the management leadership group process. As Porter and Lawler suggest, the individual's placement in the organizational hierarchy appears to be strongly related to his attitudes and behavior.⁴⁵

Franklin studied streams of organizational influence factors. His study indicated that the best predictors for the subordinate group level climate were organizational climate followed by group process, managerial leadership and peer leadership. Analyzing the data across time indicated that the best predictor for the subordinate level climate in time two was the superior group process from time one.⁴⁶

Perrow also suggested that the work processes of an organization provide the basic foundation upon which the social structure of an organization is built.⁴⁷ Thus, looking at the specific work processes in the organization,

⁴⁴ Franklin, J. "Down the Organization: influence processes across levels of hierarchy." *Administrative Science Quarterly*, 20, 1975, 153-164.

⁴⁵ Porter, L. and E. Lawler. "Properties of Organizational Structure in Relation to Job Attitudes and Behaviors." *Psychological Bulletin*, 64, 1965, 23-51.

⁴⁶ Franklin, J., op. cit., 1975.

⁴⁷ Perrow, C. "A Framework for the Comparative Analysis of Organizations." *American Sociological Review*, 32, 1955, 195-208.

in addition to the hierarchical levels, should provide an improved indication of the management control climate which exists. Hage and Aiken found that the more routine the work flow the greater the centralization of decision making about basic organizational issues. Routine work flows also resulted in more formalized rules but had little affect on job codification or rule observation. Although the degree of routiness and emphasis on efficiency were related there was no association between routiness and relative effectiveness as an organizational goal. The routinization of technology, however, resulted in an increasing emphasis on the number served and a decreasing emphasis on quality of service.⁴⁰

Reimann also emphasized that there was a need to differentiate between system levels and work flow levels in the organization. His research suggested that the strongest relationship to system level structure was system level technology, and that horizontal differentiation related primarily to size, formalization and dependence. Furthermore, operational decisions tended to be decentralized for relatively lower degrees of mass

⁴⁰ Hage, J. and M. Aiken. "Routine Technology, Social Structure, and Organizational Goals." *Administrative Science Quarterly*, 14, 1969, 366-377.

production, and greater rates of technological change.⁴⁹

Fry and Slocum's research also suggested a need to consider work group technology, with respect to management climate, which was conceptualized along three dimensions--number of exceptions, nature of search for resolution when exceptions occur, and interdependence. The work group was defined as the smallest formal grouping of personnel within an organization. Number of exceptions was the degree to which stimuli were perceived as familiar or unfamiliar by members of the work group. The search behavior referred to the nature of the search that took place by individuals when exceptions occurred. Interdependence was the degree to which individuals were dependent on and supported others in the task accomplishment. This research found negative correlations within these three technology dimensions. The less specialized groups had more rules and their officers had larger spans of control, however, the narrower the span of control the more the members reported participating.⁵⁰

⁴⁹ Reinmann, B. "Organizational Structure and Technology in Manufacturing: system vs. workflow level perspectives." *Academy of Management Journal*, 23, March 1980, 61-77.

⁵⁰ Fry, L. and J. Slocum, Jr. "Technology, Structure, and Workgroup Effectiveness: a test of a contingency model." *Academy of Management Journal*, 27:2, June 1984, 221-246.

Span and Locus of Control

Five factors which may affect the manager's span of control involve: complexity of the job, visibility of the results, interdependence and need for coordination among tasks, degree to which interdependent activities require human intervention as opposed to mechanical intervention, and the kinds of personnel required by technology.²¹ In addition to the task characteristics which affect a manager's span of control, an individual's reaction to a type of control system may also be dependent upon his locus of control orientation.

Locus of control orientation deals with the individual's generalized expectancy regarding whether outcomes are externally controlled or internally controlled. Research has indicated that individuals with an external locus of control orientation experience more alienation and less satisfaction on the job. Supervisors with an internal locus of control orientation are happier with participation than those whose orientation is external and less satisfied with a directive style.

Managers are more likely to have an internal orientation than are non-managers, and the higher up the hierarchy the manager is the more likely his orientation is to be

²¹ Hunt, R. "Technology and Organization." *Academy of Management Journal*, 13, 1970, 235-252.

internal. Managers with an internal orientation also perceive a stronger relationship between working hard and good performance, and between good performance and receiving rewards.⁸² Additionally, managers with an external locus of control orientation are more likely to use coercive power while those with internal orientations tend to use personal persuasion power.

Power

The management control climate will also reflect the distribution of power within the organization, that is the interplay between the political processes (goal formation) and the economic processes (resource allocation).⁸³

French and Raven have suggested that bases of power will fall into the categories of reward, coercive, legitimate, referent, and expert.⁸⁴ Katz and Kahn have suggested combining referent and expert power to develop a measure of incremental influence.⁸⁵ Ivancevich's study used the notion

⁸² Mitchell, T., C. Smyser, and S. Weed. "Locus of Control: supervision and work satisfaction." *Academy of Management Journal*, 18, September 1975, 623-631.

⁸³ McNeil, K., op. cit., 1978.

⁸⁴ French, J and G. Raven. "The Bases of Social Power." In D. Cartwright and A. Zander (Eds.), Group Dynamics, 2nd Ed., Evanston, Illinois, Row Peterson, 1960, 607-623.

⁸⁵ Katz D. and R. Kahn, op. cit., 1966.

of incremental influence to test satisfaction. This study found that the use of incremental influence resulted in positive satisfaction based on status, autonomy and growth, while the use of reward, coercive and legitimate power resulted in negative satisfaction. Although legitimate power did not result in satisfaction it did produce motivation.⁵⁶

In order to maintain or legitimate authority (power) the flow of information necessary for control must be manipulated in a manner which keeps subordinates ignorant.⁵⁷ As Markus and Pfeffer's review of prior research suggests, sophisticated control mechanisms, such as budgeting and performance reports, are constructed in a manner which maximizes the flow of information upward and minimizes the flow of information downward.

The ability to dominate and adapt additionally provide a power base for individuals within the organizational administration.⁵⁸ Since the ability to determine the information to be used results in organizational power those with power will seek to influence the control mechanism to

⁵⁶ Ivancevich, J. "Analysis of Control, Basis of Control and Satisfaction in an Organizational Setting." *Academy of Management Journal*, 13, December 1970, 427-436.

⁵⁷ McNeil K., *op. cit.*, 1978.

⁵⁸ Hickson, D., C. Hinings, C. Lee, R. Schneck, and J. Pennings, *op. cit.*, 1971.

maintain their power.⁸⁹ Therefore, the ability to evaluate with information and reward according to that information becomes a key element of formal authority and power.

The design of the management control system will be used to reinforce the existing power structure in the key areas of decision making, alteration of organizational performance, and legitimating authority. As a result, the management control climate will reflect the organizational distribution of power, culture and system of shared values and beliefs, and the extent of agreement about technology and goals.⁹⁰ Although participation has often been suggested to improve organizational goal congruence and the relationship between the managed and management, it is often opposed by management from the standpoint that it requires a redistribution of power.

Participation

Participation has been broadly defined as the ability to exert influence in the decision-making process through interaction between workers and management based on

⁸⁹ Markus, M. and J. Pfeffer . "Power and the Design and Implementation of Accounting and Control Systems." *Accounting, Organizations and Society*, 8:2/3, 1983, 205-218.

⁹⁰ Ibid.

information sharing.¹ This notion has led researchers to offer suggested benefits for participation in the budgeting process which involve inducing internalization of budget goals,² resolving conflicts and individual differences about goals,³ providing operating managers a sense of challenge and responsibility,⁴ providing individuals with a sense of well-being and self-actualization,⁵ and creating work group harmony and cohesion.⁶

In support of some of these notions, Hofstede's research indicated that participation in the budgeting process led to high motivation in the area of financial standards but not technical standards. Those supervisors

¹ Wall, T. and J. Lischeron. Worker Participation: A Critique of the Literature and some Fresh Evidence, New York, New York, McGraw-Hill, 1977.

² Hanson, E. "The Budgetary Control Function." The Accounting Review, 40, 1966, 239-242

³ Schiff, M. and A. Lewin, op. cit., 1970.

⁴ Caplan, E. Management Accounting and Behavioral Science. Reading, Massachusetts, Addison-Wesley, 1971; Swieringa, R. and R. Moncur. Some Effects of Participative Budgeting on Managerial Behavior. New York, New York, National Accounting Association, 1975.

⁵ Mulder, M. "Power Equalization Through Participation." Administrative Science Quarterly, 16, 1971, 31-38.

⁶ Likert, R. New Patterns of Management, 1961, and The Human Organization: Its Management and Values, 1967, New York, New York, McGraw-Hill; Ronen, J. and J. Livingstone, op. cit., 1975.

who had never experienced participation, however, did not necessarily have unfavorable attitudes toward their superiors or the organization. Additionally, leadership style, authoritative vs. democratic, was found to moderate the relationship between participation and motivation.⁶⁷ Milani also found a strong relationship between budget participation and attitudes toward the job and the organization.⁶⁸

In terms of the effect of participation on motivation, Searfoss and Monczka found significant positive relationships between perceived participation and motivation, need for participation and independence, and perceived participation and hierarchical level.⁶⁹ Searfoss's research also indicated a significant relationship between the foremen's perception of participation and their goal directing effort.⁷⁰ Other researchers have found positive relationships between, perceived control and overall

⁶⁷ Hofstede, G. The Game of Budget Control. London, England, Tavistock Publishers Limited, 1968.

⁶⁸ Milani, K. "The Relationship of Participation in Budget Setting To Industrial Supervisory Performance and Attitudes." *The Accounting Review*, 50, 1975, 274-284.

⁶⁹ Searfoss, D. and R. Monczka. "Perceived Participation in the Budget Process and Motivation to Achieve the Budget." *Academy of Management Journal*, 16, 1973, 541-554.

⁷⁰ Searfoss, D. "Some Behavioral Aspects of Budgeting for Control: An Empirical Study." *Accounting, Organizations and Society*, 1, 1976, 375-384.

effectiveness, participation and job involvement, and participation and motivation.⁷¹ Brownell, however has suggested that the individual's locus of control orientation may moderate the relationship between participation and performance.⁷² Additionally, Dunbar suggested that an individual's desire to participate was related to their perceived expertise and economic self-interest.⁷³

Implications for Management Accounting Control

A synthesis of the prior research seems to imply that in attempting to reduce uncertainty organizations will develop varying management control climates. As organizations become larger there will be a tendency toward standardization, formalization, and a tighter management control climate. Placing high values on these bureaucratic administrative techniques tends, however, to foster job specification which may result in lower job satisfaction and

⁷¹ Kavocic, B., V. Ruo, and A. Tannenbaum. "Control, Participation and Effectiveness in Four Yugoslavian Industrial Organizations." Administrative Science Quarterly, 16, 1971, 74-86; Vroom, V. Work and Motivation. New York, New York, Wiley and Sons, 1964.

⁷² Brownell, P. "A Field Study Examination of Budgetary Participation and Locus of Control." The Accounting Review, 57, 1982, 766-777.

_____. "Participation, Locus of Control and Organizational Effectiveness." The Accounting Review, 55, 1981, 844-860.

⁷³ Dunbar, R. "Budgeting for Control." Administrative Science Quarterly, 16, 1971, 88-96.

less autonomy. Additionally, there is a need to consider the individual's placement in the organization's work processes, as well as the hierarchical levels, since the management control climate employed may vary between organizational processes and levels.

The perceived management control climate may also be affected by the individual's locus of control orientation which may not be compatible with the actual control mechanism employed by the organization. Attempting to change control mechanisms within an organization to suit individual needs, however, will be difficult since these mechanisms tend to support the existing power structure. Access to control information also provides a source of power within the organization. Although research suggests that power influences job satisfaction, attempts at redistributing power, such as increasing participation are usually not satisfactory to management.

The application of management accounting to the control process and the generation of variances which are used to reward and punish reflects what might be referred to as coercive power. Research on various types of power, however, indicates that coercive power provides neither satisfaction nor motivation. Although the performance report does provide the legitimation of authority which may provide motivation to achieve the budget.

The management accounting process and the resultant feedback will also provide one of the required mechanism for keeping subordinates ignorant. The report at lower levels will be for departments only and these reports will be aggregated as they are prepared for upper levels of management. Thus, only the top level of management knows the overall performance and goals, i.e., management accounting provides the privileged information necessary for power. This data, however, will be highly aggregated and will obscure interdependencies which exist at lower levels.

Management accounting requires standardization and formalization of tasks in order to collect quantifiable information, monitor, and evaluate results. Thus, the management accounting process will likely result in more centralized decision making, tighter control systems, decreased spans of control (power) at lower levels, and decreased participation.

Accounting vs. Non-Accounting Control Mechanisms

The type of control strategy the manager selects will be affected by his location in the organizational hierarchy. To assess the degree of conformity to role prescription two types of control may be used, personal surveillance (behavior control) and measurement of outputs (output control).

Ouchi and McGuire's research indicated that behavior control was used in response to both the need and the ability for direction and guidance, while output control was used to provide legitimate evidence or to protect one's position. The use of a particular type of control was closely related to the manager's position in the organizational hierarchy. The higher the manager's position in the organization the more output control was used and the less behavior control was used. Furthermore, the greater the manager's knowledge of the task the more likely he was to use behavior control rather than output control.⁷⁴ Therefore, in studying the organizational climate and its affect on control, individuals will be grouped according to various hierarchical levels within the organization.

Implications for Management Accounting Control

As prior research indicated upper levels of management tend to focus on output control for evaluation purposes while lower levels of management focus on behavior control. A major supplier of output control in the organization is management accounting. Therefore, it is likely that upper levels of management will consider performance report evaluations to be more appropriate and use them to a greater

⁷⁴ Ouchi, W. and M. McGuire, op. cit., 1975.

degree than lower levels of management.

Implications for Research

Although this study is not concerned with evaluating the organizational and management climate, the findings of the foregoing research must be considered. Therefore, information regarding the external and internal environment, organizational and managerial structure, and the control structure will be gathered through interviews, and questionnaires.

Based on the previous research findings it seems highly likely that the management accounting system, and the performance report in particular, will be affected by these organizational variables. Thus, a working knowledge of these variables, in each organization, will be obtained to enhance the interpretation, explanation, and conclusions of this research effort.

RELATIONSHIP C



Overview

To control performance, management requires a mechanism which collects actual performance data and then compares it against a standard.⁷⁵ The process of bringing about effective performance behavior, however, requires that the control system and performance evaluation system be linked.⁷⁶ The performance report provides management with a mechanism which compares actual performance against a standard. The necessary link between the control system and the performance evaluation system may be accomplished if management bases rewards and punishments on the resultant performance report variances.

Subjective vs. Formula-Based Evaluations

Govindarajan's study used contingency theory to assess the impact of uncertainty on the style of performance evaluation. The results indicated that subjective performance evaluations resulted in greater performance effectiveness than formula-based evaluations. There was also a significant relationship between environmental uncertainty and evaluation style. Managers facing high environmental uncertainty tended to use subjective

⁷⁵ Child, J., op. cit., 1973; Conlon, E., op. cit., 1980.

⁷⁶ McNeil, K., op. cit., 1978.

evaluation to a greater degree than managers in situations of low uncertainty. Generally, managers faced with low uncertainty environments tended to rely primarily on formula-based evaluation measures.⁷⁷

Performance Report Projected Goal

A review of the literature regarding the effect of goal difficulty and attainability on performance suggests that:⁷⁸

1. groups assigned difficult goals tend to outperform groups assigned moderate or easy goals.
2. performance is better if goals are clear and quantitative rather than unclear or subjective.
3. the goals must be perceived of as attainable.
4. assigned goals have an affect on the individual's behavior to the extent that they are accepted by the individual.

Carroll and Tosi found perceived goal difficulty was positively related to self-rated managerial efforts for those individuals who were high on self assurance, mature,

⁷⁷ Govindarajan, V. "Appropriateness of Accounting Data in Performance Evaluation: an empirical examination of environmental uncertainty as an intervening variable." *Accounting, Organizations and Society*, 9, 1985, 125-135.

⁷⁸ Locke, E. "Towards a Partial Theory of Task Motivation and Incentives." *Organization Behavior and Human Performance*, 3, 1968, 157-189.

_____, K. Shaw, L. Saari, and G. Latham. "Goal Theory and Task Performance: 1968-1980." *Psychological Bulletin*, 90, 1981, 125-152.

and perceiving rewards to be contingent upon performance.⁷⁹ Hofstede's research, however, indicated that tight budget standards led to poor attitudes and expectations, and low motivation.⁸⁰ Although Kenis's study suggested that goal clarity was related to job satisfaction and positively related to attitudes toward the budget and managerial motivation, he also concluded that tight budgets were associated with low motivation, poor attitudes, and performance.⁸¹

Implications for Research

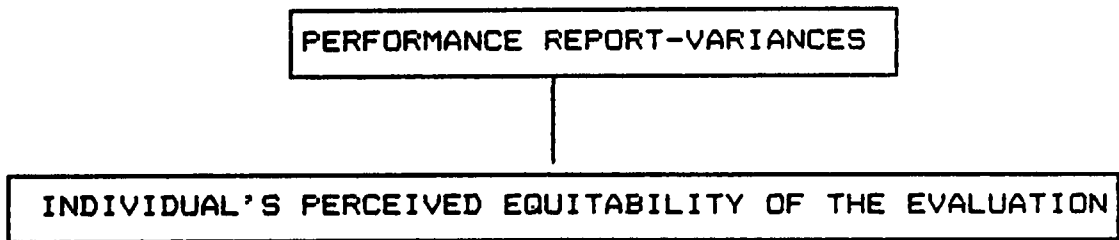
While the budget initially represents the quantitative performance goal, the evaluation process later relies on the performance report to represent the individual's success or lack thereof in achieving the goal. Thus, it appears that the performance report is the formula-based measure being used in an attempt to motivate individuals to improve performance.

⁷⁹ Carroll S. and H. Tosi. "Goal Characteristics and Personality Factors in a Management By Objectives Program." *Administrative Science Quarterly*, 15, 1970, 295-305.

⁸⁰ Hofstede, G., op. cit., 1968.

⁸¹ Kenis, I. "The Effects of Budget Goal Characteristics on Managerial Attitudes and Performance." *The Accounting Review*, 54, 1979, 701-721.

RELATIONSHIP D



Overview

Although this research focuses on the performance report, prior studies limited to examining attitudes toward budgeting may provide important insights. Evidence from the literature suggests that accounting controls are sometimes rigidly used in organizations despite managers' knowledge of the existence of complex tasks which require flexibility.²² Thus, some managers may perceive the accounting system to be an incomplete and imperfect measure of their performance,²³ while others may feel that the accounting measures are unfair, unobjective, uninfluenced by a variety of important factors, and thus, incapable of providing a true description

²² Hertzog, J. "The Role of Information and Control Systems in the Process of Organizational Renewal: Roadblock or Roadbridge." *Accounting, Organizations and Society*, 3, 1978, 29-45; Ansari, S. "Towards an Open System Approach to Budgeting." *Accounting, Organizations and Society*, 4, 1979, 149-161.

²³ Hayes, D. "The Contingency Theory of Management Accounting." *The Accounting Review*, 51, 1977, 22-39.

of managerial activities.⁸⁴

Attitudes Toward Budgets

Hopwood explored the effects of four different styles of evaluation; budget constrained, budget-profit, profit conscious, and non-accounting. His study indicated that the two styles of budget evaluation resulted in managers experiencing increased amounts of tension. Additionally, the evaluation methods which focused on the budget were believed to be less fair by managers than the profit conscious or non-accounting styles. More importantly, managers who were evaluated under the budget styles experienced less favorable relations with superiors and subordinates, participated more in budgeting manipulation techniques, misunderstood the importance of the budget in their performance evaluation, and experienced less goal clarity.⁸⁵ Thus, Hopwood concluded that the use of budgets promoted dysfunctional behavior.

Otley attempted to replicate and extend Hopwood's findings by employing similar styles of evaluation. His study also incorporated perceptions regarding the way budgets were used in the performance evaluation, trust of

⁸⁴ Lawler, E. and J. Rhode. Information and Control in Organizations. Pacific Palisade, California, Goodyear Publishing Co., 1976.

⁸⁵ Hopwood, A., op. cit., 1972.

one's manager, job ambiguity, and the perceived fairness of the evaluation. Results of the study indicated that managers' attitudes regarding the method of evaluation did not appear to be strongly related to the style which was perceived to be used. Otley, like Hopwood, found that there appeared to be a lack of congruence between middle and lower level managers' perceptions of how they were evaluated and upper level managers' perceptions of how they evaluated performance.

Furthermore, managers who disagreed with the appropriateness of the evaluation being used reported increased job tension, and managers who were evaluated under the budget styles experienced more job ambiguity; however, they were more often able to meet their budgets, i.e., performed better. Thus, Otley concluded that the budget styles might promote better performance, that is functional behavior. He qualified this finding, however, since a review of the corporate data indicated that the managers might have been participating in budget manipulating activities.●●

Brownell attempted to reconcile the differences between Hopwood and Otley's findings. Brownell collapsed the four classifications of evaluation style into two classifications, high budget emphasis and low budget

●● Otley, D., op. cit., 1978.

emphasis. The results of his study indicated that high performance (self-reported) was associated with decreased budget emphasis, and increased budget emphasis resulted in increased job satisfaction.⁸⁷ Unfortunately, Brownell's study failed to reconcile the differences found in the earlier studies, although he tended to agree with Hopwood's conclusion that the use of budgets promoted dysfunctional behavior.

Other research findings tend to support some of the various conclusions reached by Hopwood, Otley, and Brownell. Merchant's analysis of organizational performance with respect to budgets suggested that performance was negatively correlated with requirements to explain variances and positively correlated with influence on budgets and involvement in budgeting activities.⁸⁸ Further support for the existence of this relationship was supplied by Bruns and Waterhouse, who found that perceived control was negatively correlated with the limiting features of budgets and positively correlated with the acceptance of methods

⁸⁷ Brownell, P. "The Role of Accounting in Performance Evaluation, Budgetary Participation and Organizational Effectiveness," 1982.

⁸⁸ Merchant, K. "The Design of the Corporate Budgeting System: Influence on Managerial Behavior and Performance." *The Accounting Review*, 1981, 813-829.

employed.⁸⁷ Collins, Seiler and Clancy's findings also tend to support relationships found by Hopwood, Otley and Brownell since their analysis of budgetary attitudes and motivation indicated that:⁹⁰

1. negative attitudes toward the budget were associated with negative motivation.
2. less influence in the budgetary process was associated with higher negative motivation (budget slack, withdrawn support, or intentional errors).
3. perceptions of high amounts of conflict between superiors in the budgetary process resulted in high negative motivation for subordinates.
4. increased perceptions of ambiguity resulted in lower ratings of positive motivation.
5. the more the budget variances were perceived to be used in performance evaluation the higher the positive motivation.

Feedback

Organizations attempt to use feedback to bring about some predetermined behavior. A review of the feedback literature led Latham and Yukl to suggest four ways in which feedback might lead to improved performance; it might induce the setting of goals by individuals who lack them; it might

⁸⁷ Bruns, W. and J. Waterhouse. "Budgetary Control and Organizational Structure." *Journal of Accounting Research*, Autumn 1975, 177-203.

⁹⁰ Collins, F., R. Seiler, and D. Clancy. "Budgetary Attitudes: the effects of role senders, stress and performance evaluation." *Accounting and Business Research*, 1984, 163-168.

raise an individual's goal levels; it might inform individuals when their current performance is unsatisfactory, and it might result in greater effort being put forth.⁷¹

The effect of feedback, however, on the individual's behavior and the resultant performance will be dependent on his acceptance of the feedback. Additionally it has been suggested that poor job performance may result if feedback is infrequent and/or unclear with respect to the individual's performance on the job.⁷² If the individual feels that the feedback is not clear or appropriate a conflict may arise. In fact some researchers have suggested that the lack of feedback may result in low morale, low confidence and hostility,⁷³ and that feedback clarity and frequency are required for the formation of subsequent aspiration levels.⁷⁴

Hofstede's research indicated that motivation was correlated with the frequency of communication regarding

⁷¹ Latham, G. and G. Yukl. "A Review of Research on the Application of Goal Setting in Organizations." *Academy of Management Journal*, 18, 1975, 824-845.

⁷² Lawler, E. "Control Systems in Organizations." In Dunnett, M. (ed.), Handbook of Industrial and Organizational Psychology, Chicago, Illinois, Rand McNally, 1976.

⁷³ Becker, S. and D. Green. "Budgeting and Employee Behavior." *Journal of Business*, 1962, 392-402.

⁷⁴ Stedry, A. Budget Control and Cost Behavior. Englewood Cliffs, New Jersey, Prentice-Hall, 1960.

costs and variances by the supervisor. Additionally, when responsibilities were clear cut the budget reports resulted in favorable attitudes by individuals being evaluated.⁷⁰ Kenis found feedback to be weakly and positively correlated with motivation and job satisfaction.⁷¹ Cook found the frequency of feedback to be associated with job satisfaction and performance.⁷²

Conlon's research indicated that the type of feedback was important in the persistence of a behavior. The decision to persist in a behavior, if the outcome was valued, was greater if the feedback confirmed a condition, than it was if it disconfirmed a condition. The type of feedback also affected the direction of the belief, while feedback in general affected the strength of the belief regarding the outcome.⁷³

Other factors affecting the individual's acceptance of performance feedback involve whether it is positive or negative, and its source. Ivancevich and McMahon found that self-generated feedback was superior to externally generated feedback in the areas of cost control, quality control,

⁷⁰ Hofstede, G., op. cit., 1967..

⁷¹ Kenis, I., op. cit., 1979.

⁷² Cook, D. "The Effects of Frequency of Feedback on Attitude and Performance." *Journal of Accounting Research*, 5, 1968, 213-224.

⁷³ Conlon, E., op. cit., 1980.

unexcused overtime completions, intrinsic satisfaction and commitment to the organization."⁹⁹ Furthermore, Foran and DeCoster indicated that the individual's commitment to, or acceptance of, performance standards was significantly greater if the feedback was favorable.¹⁰⁰

Of particular importance regarding the use of performance reports is Child's research which indicated that the greatest source of conflict resulted from the use of performance-oriented records followed by specialization and standardization. Although the presence of disagreement/conflict encouraged challenging authority, the bureaucratic structure also inhibited pressing for change (innovation).¹⁰¹

Implications for Research

Synthesizing the results of the studies mentioned in this section would seem to indicate that individuals tend to form attitudes regarding the feedback provided by the evaluation system and its equitability which will, in turn, affect their motivation to perform. These attitudes are

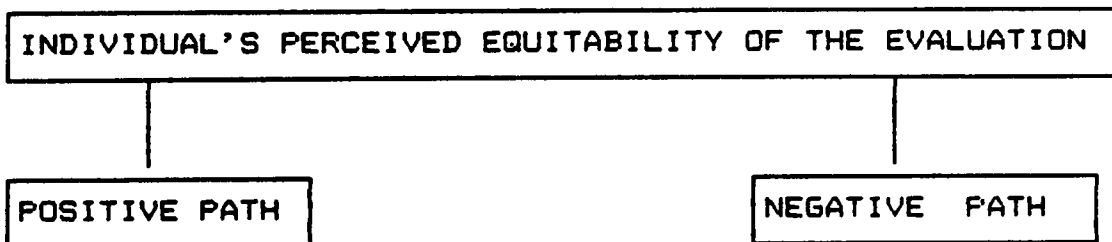
⁹⁹ Ivancevich, J. and J. McMahon. "The Effects of Goal Setting, External Feedback and Self-Generated Feedback on Outcome Variables: A Field Experiment." *Academy of Management Journal*, 25(2), 1982, 359-372.

¹⁰⁰ Foran, M. and D. DeCoster, op. cit., 1974.

¹⁰¹ Child, J., op. cit., 1973.

likely to be affected by the type of feedback, i.e., negative or positive variances, and the clarity and frequency of the performance report.

RELATIONSHIP E



Overview

Vroom suggests that the effort expended by an individual is a function of the desirability of the outcome and the probability that the outcome can be achieved.¹⁰² This theory employs three important variables, instrumentality, valence and expectancy. Instrumentality is defined as the belief that certain outcomes will lead to other outcomes. Valence is essentially the desirability of the outcome, and expectancy is the probability that the act will be followed by the outcome.

An individual's motivation to perform, therefore, is a

¹⁰² Vroom, V., op. cit., 1964.

function of the desirability of the outcome (intrinsic and extrinsic), the instrumentality of the performance for the outcome, and the probability that performing the act will result in the desired outcome. An extension of the general expectancy model was suggested by Porter and Lawler who incorporated role perceptions into their model. Role perceptions were defined as the kinds of activities that the individual believed were required to perform the job successfully.¹⁰³

Role Ambiguity and Conflict

Role ambiguity has been defined as the extent to which an individual perceives uncertainty with regard to the performance requirements or evaluation, i.e., what is considered "good performance." Role conflict has been defined as the extent to which a person receives mixed signals regarding what constitutes good performance.¹⁰⁴

The individual being evaluated may experience role ambiguity if there is a lack of clear and consistent information about the work role and the expectations of the work role. That is, the individual lacks clear information

¹⁰³ Heneman, H. and D. Schwab. "Evaluation of Research in Expectancy Theory and Prediction of Employee Performance." *Psychological Bulletin*, 78, 1972, 1-9.

¹⁰⁴ Rizzo, J., R. House, and S. Lirtzman. "Role Conflict and Ambiguity in Complex Organizations." *Administrative Science Quarterly*, 15, 1970, 150-163.

regarding the responsibilities and expectations regarding what constitutes effective performance.¹⁰⁵ If the individual is experiencing role ambiguity this may affect his attitudes toward the performance report and performance evaluations in general since prior research indicates that role ambiguity may be associated with mental strain, job tension, anxiety and depression,¹⁰⁶ job dissatisfaction,¹⁰⁷ unfavorable attitudes toward organizational role senders,¹⁰⁸ and resentment of superiors.¹⁰⁹

Work Role and Role Outcomes

Graen extended the Vroom-Porter-Lawler model incorporating

¹⁰⁵ Kahn, R., D. Wolfe, R. Quinn, D. Snoek, and R. Rosenthal. Organizational Stress: Studies in Role Conflict and Ambiguity. New York, New York, Wiley and Sons, 1964.

¹⁰⁶ Karasek, R. "Job Demand, Job Decision Latitude and Mental Strain: Implication for Job Redesign." *Administrative Science Quarterly*, 24, 1979, 285-308; Gupta, N. and T. Beehr. "Job Stress and Employee Behavior." *Organization Behavior and Human Performance*, 23, 1979, 373-387.

¹⁰⁷ Caplan, R. and K. Jones. "Effects of Work Load, Role Ambiguity and Type A Personality on Anxiety, Depression and Heart Rate." *Journal of Applied Psychology*, 60, 1975, 713-719; Beehr, T., J. Walsh, and T. Taber. "Relationship of Stress to Individually and Organizationally Valued States: Higher Order Needs as Moderators." *Journal of Applied Psychology*, 61, 1976, 41-47; Rizzo, J., R. House, and S. Lirtzman, op. cit., 1970.

¹⁰⁸ Miles, R. "An Empirical Test of Causal Inference Between Role Perceptions of Conflict and Ambiguity and Various Personal Outcomes." *Journal of Applied Psychology*, 60, 1975, 334-339.

¹⁰⁹ Caplan, R. and K. Jones, op. cit., 1975.

first and second level outcomes. First level outcomes were defined as the work role and second level outcomes were defined as the work role outcomes. This research indicated that job satisfaction was the result of the degree of satisfaction with the work role. Additionally the perceived instrumentality of the work role for attaining valued work role outcomes affected job satisfaction and, in turn, performance.¹¹⁰

Unfortunately, the individual's perception of what constitutes the appropriate work role (job requirements) may be affected by his location in the organization.¹¹¹ Therefore, it would seem imperative that management effectively communicate the "appropriate" work role to the individual if expected performance is to be the result. Additionally, it seems likely that the performance evaluation report must also reflect this congruent work role in order to be perceived as a valid evaluation of job performance by the subordinate,¹¹² i.e., the role must not be perceived of as ambiguous.

¹¹⁰ Graen, G. "Instrumentality Theory of Work Motivation: some experimental results and suggested modifications." *Journal of Applied Psychology*, 53, 1969, 1-25.

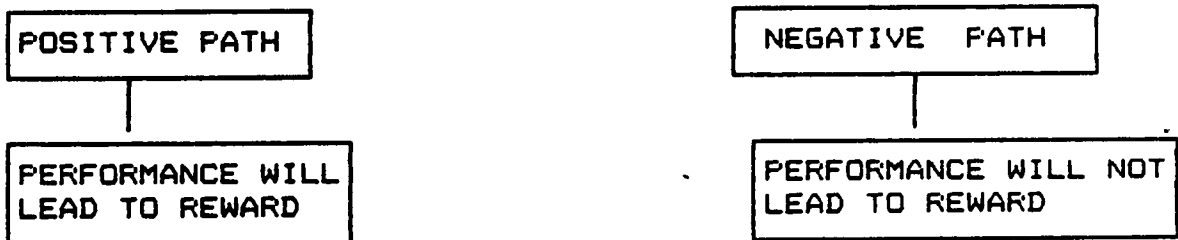
¹¹¹ Ranson, S., B. Hinings, and R. Greenwood. "The Structuring of Organizational Structures." *Administrative Science Quarterly*, 25, March 1980, 1-17.

¹¹² Foran, M. and D. DeCoster, op. cit., 1974.

Implications for Research

The individual's motivation to perform is a function of the desirability of the work role outcome, the instrumentality of performing the work role to achieve the outcome, and the probability that performing the work role will lead to the outcome. Thus, the individual should perceive the performance report as being either a positive or negative mechanism in helping him to improve performance and in turn achieve the valued outcome or the reward. Since the performance report tends to be externally generated, however, and often contains unfavorable variances there may be a tendency for it to be rejected by the individual being evaluated. Additionally, the evaluation may be rejected if it does not reflect a congruent or acceptable work role.

RELATIONSHIP F



Overview

Expectancy and instrumentality theory suggests that the

individual will make an evaluation regarding his performance and whether or not it serves as a vehicle for obtaining the reward. That is, the individual must perceive that variations in performance will lead to variations in the amount of reward received.¹¹³

Attitudes

Knowledge of the individual's attitudes regarding expectancies and outcomes of performance is particularly important in assessing the ability of the performance report to act as a motivator, since prior research suggests that these attitudes tend to be the best predictors of performance.¹¹⁴ In other words, there is a cause-and-affect relationship between expectations regarding performance in time period one and performance rankings in time period two.¹¹⁵ Additionally, other research has indicated that

¹¹³ Gailbraith, J. and L. Cummings. "An Empirical Investigation of Motivational Determinants of Task Performance: Interactive Effects Between Instrumentality-Valence and Motivation-Ability." *Organizational Behavior and Human Performance*, 2, 1967, 237-257.

¹¹⁴ Graen, G., op. cit., 1969; Hackman, J. and L. Porter. "Expectancy Theory Predictions of Work Effectiveness." *Organizational Behavior and Human Performance*, 3, 1968, 407-426; Lawler, E. and J. Suttle. "Expectancy Theory and Job Behavior." *Organizational Behavior and Human Performance*, 9, 1973, 482-503.

¹¹⁵ Cherrington, D. and J. Cherrington. "Appropriate Reinforcement Contingencies in the Budgeting Process." *Journal of Accounting Research*, 11, 1973, 225-253.

those managers who were ranked as the best performers also perceived a stronger relationship between good performance and the attainment of the reward.¹¹⁶

Reward Contingency

Cherrington and Cherrington have suggested that it is not so much the budget instrument that has the influence on individuals as it is the positive and negative reinforcing consequences and the reward contingencies which are associated with them.¹¹⁷ When rewards are made contingent upon good performance, subordinates have expressed satisfaction with their work, supervision, and advancement opportunities. Additionally, high performers indicated more satisfaction than low performers with work and pay when their superior administered contingent rewards rather than non-contingent rewards.¹¹⁸

Schiff and Lewin suggest that when the reward structure places too much emphasis on whether the feedback is positive

¹¹⁶ Ibid.; Lawler, E. and L. Porter. "Antecedent Attitudes of Effective Managerial Performance." *Organizational Behavior and Human Performance*, 2, 1967, 122-142.

¹¹⁷ Cherrington, D. and J. Cherrington, op. cit., 1973.

¹¹⁸ Podsakoff, P., W. Todor, and R. Skov. "Effects of Leader Contingent and Noncontingent Reward and Punishment Behaviors in Subordinate Performance and Satisfaction." *Academy of Management Journal*, 25, 1982, 810-821.

or negative, managers tend to build slack into their budgets.¹¹⁹ Other research efforts tend to support the general conclusions of Schiff and Lewin, and further indicate that common reactions to evaluations which involve budgets result in managers manipulating production figures,¹²⁰ emphasizing departmental problems,¹²¹ being less concerned with the budget,¹²² emphasizing the measure of immediate concern,¹²³ asking for justification regarding the measurement basis,¹²⁴ and/or deferring some critical decisions which may have immediate adverse impact on the performance measure.¹²⁵

¹¹⁹ Schiff, M. and A. Lewin, op. cit., 1970.

¹²⁰ Hofstede, G., op. cit., 1967.

¹²¹ Wallace, M. "Behavioral Considerations in Budgeting." *Management Accounting*, 47, 1966, 3-8.

¹²² Swieringa, R. and R. Moncur, op. cit., 1975.

¹²³ Blau, P. Dynamics of Bureaucracy. Chicago, Illinois, University of Chicago Press, 1955.

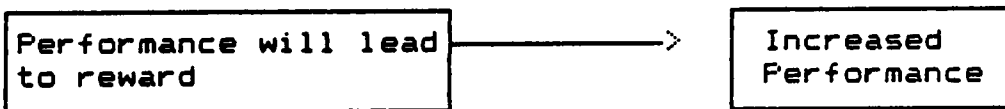
¹²⁴ Hofstede, G., op. cit., 1967; Simon, H., H. Guetzkow, R. Kozmetsky and T. Tyndall. Centralization Versus Decentralization in Organizing the Controller's Department. New York, New York, Controllership Foundation, 1954.

¹²⁵ Lawler, E. and J. Rhode, op. cit., 1976; Lawler, E., op. cit., 1976; Berliner, J. "A Problem of Soviet Business Administration." *Administrative Science Quarterly*, 1, 1956, 86-101.

Implications for Research

The results of these studies seem to indicate that if the performance report provides an accurate reflection of performance (captures the work role), enhancing the individual's ability to achieve the reward, it should be regarded as valid since it will allow the individual to isolate performance areas which need improvement in order to increase the reward. If, however, the performance report is judged to be invalid, in that it does not accurately reflect the individual's performance, then it will be seen as a barrier to obtaining the reward.

RELATIONSHIP G



Overview

Georgopolous, Mahoney and Jones studied differences in productivity employing a path-goal model. Their findings indicated that productivity was a function of path-goal perceptions; the clearer the worker's perception of the path that would result in the reward the higher the productivity. Additionally, those who rated the goal as a high need item

and also had a positive path-goal perception were more productive. Of particular importance was their finding that those who considered themselves free from barriers to performance and had a positive path-goal perception were higher producers than those who were not free from barriers but also had a positive path-goal perception.¹²⁶

Path-Goal Theory

Path instrumentality is the cognition that a particular path (behavior) will lead to a particular outcome. In work situations the individual will estimate the path instrumentality of a behavior for the accomplishment of some work goal. The individual may consider such factors as his ability to behave in an appropriate and effective manner, and the support which will be received from others in the accomplishment of the work-goal. Additionally, the individual will consider the barriers that may be present in the environment which prevent the accomplishment of the work-goal.

Path-goal theory may be expressed using the following equation:¹²⁷

¹²⁶ Georgopoulos, G., G. Mahoney, and N. Jones, Jr. "A Path-Goal Approach to Productivity." *Journal of Applied Psychology*, December 1957, 345-353.

¹²⁷ House, R. "A Path Goal Theory of Leader Effectiveness." *Administrative Science Quarterly*, 16, 1971, 321-338.

$$M = IV_b + P_1 \left[IV_a + \sum_{i=1}^n (P_{2i} EV_i) \right]$$

$$i = 1, \dots, n,$$

M = motivation to work

IV_b = intrinsic valence associated with goal directed behavior

IV_a = intrinsic valence associated with work goal accomplishment

EV_i = extrinsic valence associated with work-goal accomplishment

P₁ = path instrumentality of behavior for work goal attainment

P_{2i} = path instrumentalities of work goal for extrinsic valences

House's research indicated that the behavior of a leader is relevant to all of the parts of the equation since, at least in part, the leader determines the extrinsic reward that should be associated with the work-goal accomplishment. If the outcomes are contingent on an external rewarder, i.e., manager or supervisor, the expectancy assigned by the individual may be less if he perceives the behavior might not be observed or recognized by the rewarder. The leader can help to clarify an ambiguous path-goal relationship, however, by insuring that the individual understands the

linkage between the work goal achievement and the reward.¹²⁰

Implications for Research

These findings, combined with the discussion of prior parts of the model, suggest that if the performance evaluation is judged valid, i.e., provides the positive path-goal linkage then the individual should perceive that improving performance will lead to increased rewards. Furthermore, if the individual rates the reward as a high need satisficer then the link between productivity and the reward becomes stronger. Such a relationship would allow the management accounting control sequence to be used as a positive motivator which could bring about effective performance.

RELATIONSHIP H



¹²⁰ Ibid.

Overview

If the performance evaluation is judged invalid in that it does not accurately reflect "true" performance (the work role), then the path-goal perception should be negative.

Negative Path-Goal

A negative path-goal relationship may be perceived by the individual being evaluated if the company is basing rewards on something other than the performance report, but the individual's expectations regarding the outcome ----> reward linkage is based on the performance report. That is, the individual perceives that he cannot increase his reward by improving performance. In this instance, the performance report should be perceived as a barrier to obtaining the reward or should not be deemed instrumental.

If the individual perceives the evaluation to be negative, a barrier to receiving the reward, then there is no incentive to increase performance. Rather, the individual will react in a manner which is contrary to the organizational goals being promoted in the budget via the performance report. In this instance the performance report can not be used as a motivational mechanism since it will promote dysfunctional behavior rather than functional behavior.

Summary

The review and synthesis of the foregoing literature, with respect to the management accounting control sequence, resulted in the development of the theoretical model presented at the beginning of this chapter (Figure 2, p. 23). This model identifies several areas of importance which may be associated with the use of performance reports for evaluation purposes in the organization.

The various components of the model were used to develop the research questions and statistical hypotheses necessary to analyze the effect of using performance reports on attitudes, and in turn, performance. The research questions, statistical hypothesis and methodology are discussed in the next chapter.

CHAPTER IV- FIELD RESEARCH DESIGN

Introduction

Several earlier studies have investigated attitudes toward budgeting, utilizing a field research approach. Due to various limitations of the methods used none of the studies were successful in determining whether functional or dysfunctional behavior resulted from a particular budgetary evaluation approach. Because individual methodologies often suffer from inherent weaknesses that can only be corrected by cross checking with other techniques, this study incorporates methodologies which complement each other.

The overall research design involves a field research approach which employs individual case studies. The case study approach was used to collect observational and archival data that are used to obtain information regarding incidents and history, and informal interviewing was employed to assess the institutional norms and statuses. Additionally, a questionnaire was administered to upper, middle, and lower levels of plant management.

Since the study required a sample with well developed standard cost and performance reporting systems, manufacturing plants in the furniture industry were selected. If a plant under study was a division or segment

of a larger organization, plant management was defined as the management structure of the division or segment. Interviews with corporate management were used to determine individuals considered to be upper, middle and lower plant management. Other information gathered from corporate management included the extent to which accounting numbers were used to determine pay (salary and bonus), and perceptions regarding the appropriateness of using the accounting numbers for performance evaluation purposes.

Case Study Methodology

A case study research design is an appropriate empirical inquiry when the researcher seeks to investigate a contemporary phenomenon within a real-life context where the boundaries between the phenomenon and the context are not clearly evident and where multiple sources of evidence are available. Before deciding whether or not the case study approach should be employed for any research study the researcher should address questions with respect to three fundamental areas:¹²⁹

1. type of research question(s)

¹²⁹ Yin, R. Case Study Research Design and Methods, Beverly Hills, California, Sage Publications, 1984.

2. control an investigator has over actual behavioral events
3. focus on contemporary or historical phenomenon

The answers to these questions should allow the determination of the most appropriate methodologies given the type of research study to be undertaken.

The case study approach is preferable when the investigator has little control over behavioral events, how and why questions are being posed, and the focus is on contemporary phenomenon within some real-life context. The case study research design has been extensively used in the areas of organizational and management research since the focus of much of this research arises out of a desire to understand a complex social phenomenon. This approach may be employed for exploratory, descriptive, and/or explanatory purposes.

Since the phenomenon under study in this research involves essentially how and why questions regarding a complex contemporary social phenomenon over which the researcher has little control a case study approach appears to be appropriate. An overview of a general case study approach is provided in Appendix A.

The generalizability of a case study is to theoretical propositions rather than to populations thus the researcher

must exercise care from the beginning of the study to insure a valid application of the methodology. To provide the rigor necessary to successfully implement the case study research design four general areas must first be addressed:¹³⁰

1. The questions to be studied
2. The data which will be relevant
3. The data which should be collected
4. How the results will be analyzed

Once the researcher has answered these general questions the following five components of the research design need to be considered in depth:¹³¹

1. Study questions-- who, what, where, why, and how
2. Propositions
3. Unit(s) of analysis
4. Logic linking the data to the propositions
5. Criteria for interpreting the findings

The study questions and criteria for interpreting the findings are contained in the research questions and statistical hypotheses section of this chapter. The

¹³⁰ Ibid.

¹³¹ Ibid.

propositions and logical linking of the data to the propositions were provided in Chapter Three with the development of the theoretical model. The units of analysis were manufacturing plants, and within the plants individual department analysis was conducted which resulted in an embedded case study design with multiple cases.

To improve the results and conclusions drawn from the research findings the research design must be employed in a manner which maximizes four aspects of quality;

1. construct validity
2. internal validity
3. external validity
4. reliability

Construct validity requires the establishment of the correct operational measures for the concepts being studied. Improving the construct validity of a field research design which employs a case study approach can be achieved by using multiple sources of evidence, having key informants review the evidence, and establishing a chain of evidence. To meet the test of construct validity the researcher must cover two steps; select specific types of changes to be studied, and demonstrate that the selected measures of these changes do indeed reflect the specific types of changes that have been

selected.¹³²

The construct validity of this research was enhanced by selecting questions from questionnaires which had been previously used in the organization behavior research area. Additionally, the terminology contained in the questionnaire was reviewed with each Vice President of Manufacturing and Plant Manager to assure that the name used for the performance report was consistent with their employees' term.

Internal validity requires establishing causal relationships whereby certain conditions are shown to lead to other conditions as distinguished from spurious relationships. The internal validity of this study was enhanced by collecting information through both interviews and questionnaires since multiple sources of evidence allows pattern matching based on both sources to insure that the relationships are not spurious.

External validity establishes the domain to which a study's findings can be generalized. Survey research relies on statistical generalizations while the case study relies on analytical generalizations, i.e., generalizing to a broader theory. Additionally, the external validity of the case study design can be improved by studying multiple cases

¹³² Ibid.

which provides replication. The research design in this study employs both a theoretical model and a questionnaire to enhance its generalizability. Furthermore, the use of multiple cases (four plants) provided the replication needed to judge the external validity of the results.

Reliability demonstrates that the operations of the study can be repeated with the same results. The goal of reliability is to minimize errors and biases in the study. In the case study approach this can be achieved by using a protocol and data base. The case study protocol is a written schedule of how the study is being conducted and should include the following sections:¹³³

1. overview of the case study project (project objectives and auspices, case study issues, and relevant readings about the topic being investigated)
2. field procedures (credentials and access to case study "sites," general sources of information, and procedural reminders)
3. case study questions (the specific questions that the case study investigator must keep in mind in collecting data, table shells for specific arrays of data, and the potential sources of information for answering each question)
4. guide of case study report (outline, format for the narrative, and specification of any bibliographical information and other documentation)

¹³³ Ibid.

The case study data base is developed by using multiple sources of evidence including documents and archival records, interviews, direct observation, participant-observation, and physical artifacts. Maintaining or developing a chain of evidence can be enhanced by insuring that the data base is supported by case study notes, documents, tabular materials such as questionnaires, and narratives. The data may then be analyzed by relying on pattern matching, i.e., by relying on theoretical propositions or a theoretical model.

Reliability for this research effort has been provided by the case study protocol and data base shown under sections labeled organizational access, interviews, and questionnaire design. Additionally, multiple sources of evidence have been used which included interviews and questionnaires, and the data has been analyzed with respect to the theoretical model developed in Chapter Three.

Figure 3, contained on the following page, was used to conduct the research in the field. This model depicts the sequence of events as well as the groupings employed to analyze the statistical hypotheses.

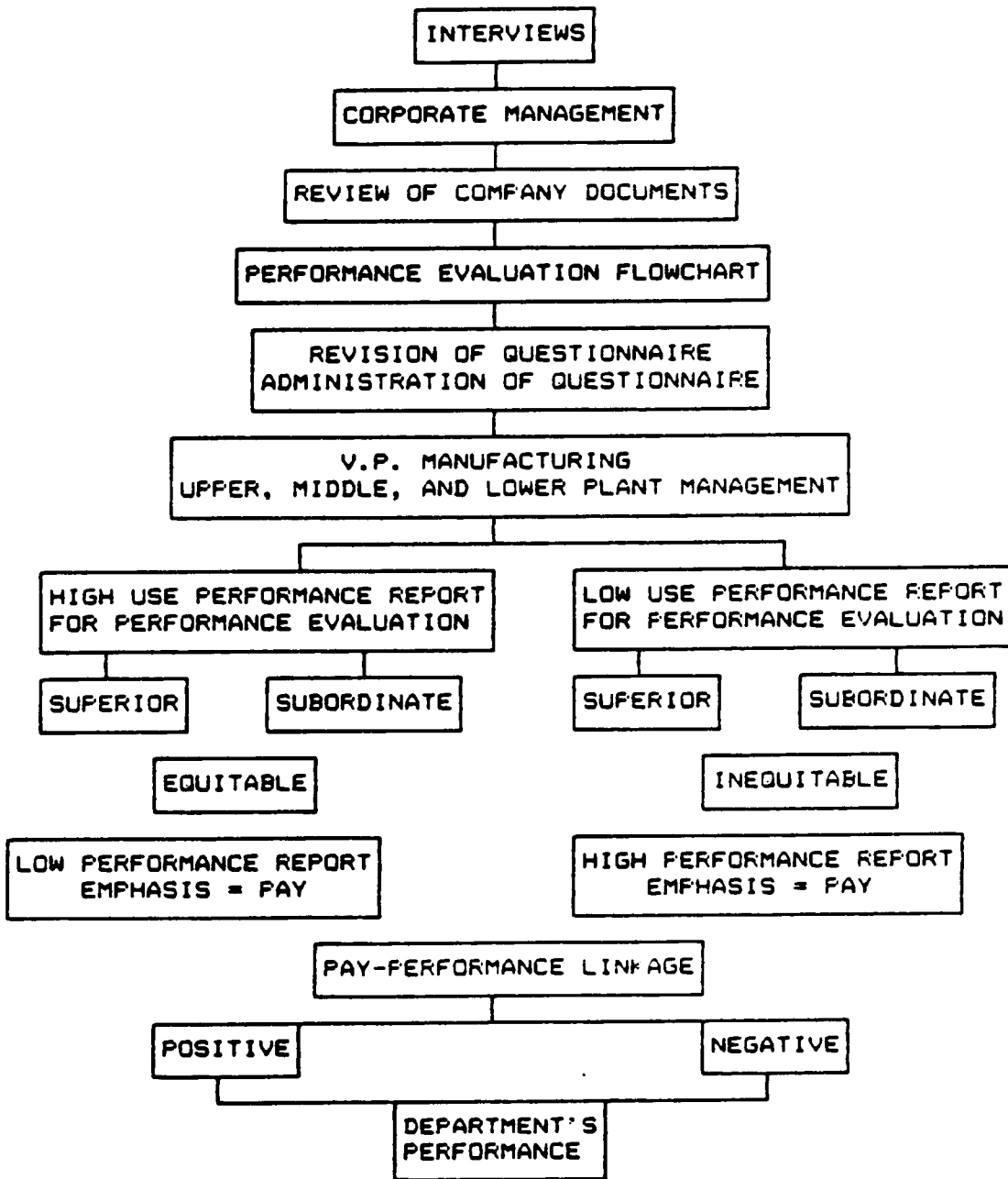


FIGURE 3- FIELD RESEARCH MODEL

Organizational Access

The organizations were first contacted by a third party to assess their willingness to participate in the study. Once the organization's interest in participating in the study had been confirmed a package (Appendix B) was mailed to the designated person in the organization giving a general overview of the study.

The contents of the package were developed based on the following strategies suggested for use in conducting field research:¹³⁴

1. Cover letter--

- a. identify the researcher, sponsor or organizational affiliation
- b. identify the study objectives
- c. assure confidentiality and anonymity of the organization's name in research publications
- d. separate the researcher from any given source of power inside or outside the organization
- e. assure the organization that you are not trying to evaluate their effectiveness, i.e., evaluating the effectiveness of the performance report's ability to communicate.
- f. ask to come for a short visit

¹³⁴ Schatzman, L. and A. Strauss. Field Research-strategies for a natural sociology. Englewood Cliffs, New Jersey, Prentice-Hall, 1973.

2. Tentative research schedule-- should indicate
- a. the length of time required from organizational members
 - b. the types of individuals who may participate in the study
 - c. need for archival data-- will help to understand the magnitude and complexity of the site
 1. construct social map- numbers and varieties of people, hierarchical arrangement and division of labor
 2. construct spatial map- location of persons, equipment, and specialized centers of work and control
 3. construct temporal map- flow of people, goods, services and communications
 - d. a willingness to provide feedback of research results

A few days after the packages were mailed, the companies were contacted via the telephone and times were arranged for interviews. The interviews resulted in narratives (Appendix C) regarding the general management structure and the use of performance report variances for evaluation purposes in each plant.

Interviews

Interviews were conducted with individuals considered to be representatives of corporate management, i.e., president,

vice president of manufacturing, and controller. The interviews were conducted first since this phase of qualitative fieldwork can provide insights and privileged information that can make a major contribution to the development of a meaningful questionnaire. Two other benefits provided by the information gathered during the initial fieldwork phase involve the verification of the importance of the proposed hypotheses, and information which may assist in the analysis and interpretation of the questionnaire results.

Some of the benefits of fieldwork to questionnaire administration in terms of the analysis and interpretation of the research results involve:¹³⁸

1. the theoretical structure that guides the analysis can be derived wholly or largely from qualitative fieldwork
2. the questionnaire results can be validated, or at least given persuasive plausibility by recourse to observations and informant interviews where informational overlap occurs
3. the statistical relationships can be interpreted by reference to field observations
4. the selection of questionnaire items for construction of indices can be based on field observations
5. the external validation of statistical constructs (indices) is afforded by observational scales

¹³⁸ Suber, S. "The Integration of Fieldwork and Survey Methods." *American Journal of Sociology*, 78, 1965, 1335-1359.

6. case studies that illustrate statistical and historical types are supported by field protocols
7. provocative but puzzling replies to the questionnaire can be clarified by resorting to the field notes

Questionnaires are also needed, in addition to the interviews conducted during the initial phase of the fieldwork, to correct for the elite bias (contact with superiors in the organization and their views) that might occur in the researcher's interpretation of the results. Furthermore, the questionnaire provides information about the interview informant or other subjects that might be overlooked otherwise. The rationale for administering questionnaires with respect to improving the general fieldwork or case study research design involve:¹³⁴

1. correction of holistic fallacy-- the tendency of the field observer to perceive all aspects of a social situation as congruent
2. demonstration of the generality of a single observation
3. verification of field interpretations
4. casting a new light on field observations-- illuminate observations that were inexplicable or misinterpreted

The questionnaires were administered on site by the researcher. By administering the questionnaire in the field the researcher knows who should fill out the questionnaire

¹³⁴ Ibid.

based on the network of relationships in the organization and who did in fact fill it out. Additionally, the researcher does not have to deal with non-responses which often occur with mail surveys.

Questionnaire Design

A general questionnaire was first developed based on the items contained in Appendix D. During the interview phase of the research the questionnaire was reviewed with corporate management. This step was considered necessary to clarify terminology and adjust for any organizational differences. Also, it was essential to insure that the terminology regarding the performance report was clear, i.e., that the questionnaire used the term for the performance report that the organization used. This was particularly important since the companies had a variety of performance appraisals and this study was only concerned with accounting performance reports that used variances.

The questionnaires (Appendix E) were administered to the plant managers, middle, and lower levels of management. The questionnaire items were developed by combining items from the Michigan Organizational Assessment Questionnaire

(MOAQ)¹³⁷ and the Perceived Work Environment (PWE)¹³⁸ questionnaire. The items contained in Appendix D have been grouped according to the general areas of demographics, supervisory style, job facets, task and role characteristics, and pay. Additionally, specific items have been added to gather data regarding performance reports.

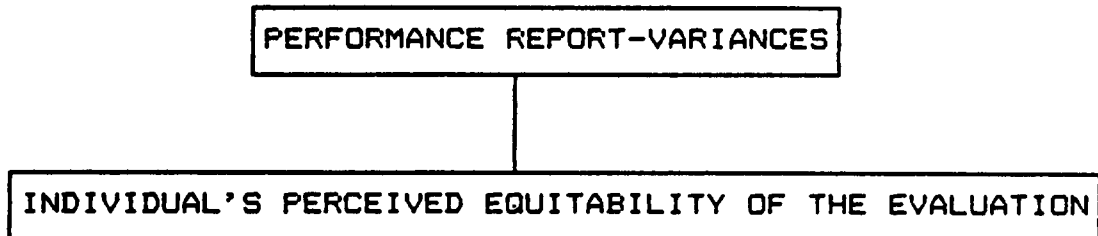
Research Questions and Statistical Hypotheses

The research questions, statistical hypotheses, and method of analysis are discussed next. Each section is broken down based on the part of the theoretical model to which the research questions and statistical hypotheses relate. Additionally, references are given to the questions used in Appendix D which form the data base.

¹³⁷ Cammann, C., M. Fichman, G. Jenkins, and J. Klesh. "Assessing the Attitudes and Perceptions of Organizational Members." In Assessing Organizational Change: A Guide to Methods, Measures and Practices. S. Seashore, E. Lawler, P. Mirvis, and C. Cammann (eds). New York, New York, Wiley, 1983, 122-138.

¹³⁸ Newman, J. Understanding Employee Reactions to the Work Environment through Personal and Organizational Frames of Reference and Perceptions of the Work Environment. Ann Arbor, Michigan, University Microfilms, 1974 Dissertation, 150-155.

RELATIONSHIP D



Respondents were first grouped according to their perceived equitability of the performance evaluation, equitable vs. inequitable, based on their responses to questions nine, ten, and twelve contained in the task and role characteristics section. Question seven in the supervisory style section was used to classify the respondents into two groups based on whether they perceived their supervisors to emphasize (high use) the performance report variances or not (low use) for performance evaluation purposes. The high vs. low use groupings were then applied in conjunction with the perceived equitability to address the following research question:

1- Is there a difference in perceptions regarding the equitability of the performance report between those who perceive it to be emphasized (important) and those who perceive it not to be emphasized for performance evaluation purposes?

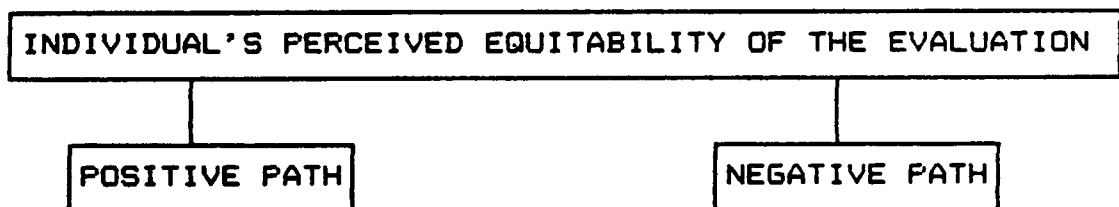
1) $H_0: EQ_H = EQ_L$

EQ_H = perceptions of equitability by those individuals who indicated high use of the performance report for evaluation purposes on the part of their supervisors

EQ_L = perceptions of equitability by those individuals who indicated low use of the performance report for evaluation purposes on the part of their supervisors

The Chi-Square test of independence was employed to analyze whether there was any relationship between the perceived equitability of the performance report and its perceived importance for performance evaluation purposes.

RELATIONSHIP E



The respondents were first classified according to whether or not they perceived the performance report to be instrumental (positive path) or noninstrumental (negative

path) in improving performance based on their responses to questions one and eleven contained in the task and role characteristics section.

The classifications achieved prior to the testing of hypothesis 2, perceived equitable vs. inequitable, were then used in conjunction with the groupings regarding positive and negative path, of the performance report, to test the following research question:

2- Is there a difference regarding the perceived equitability of the performance report between those individuals who indicate a positive path and those who indicate a negative path with respect to the performance report?

$$2) H_0: EQ_P = EQ_N$$

EQ_P = the positive path performance report managers' perceptions of the equitability of the performance report

EQ_N = the negative path performance report managers' perceptions of the equitability of the performance report

The Chi-Square test of independence was employed to analyze whether there was any relationship between the

perceived equitability of the performance report and the perception of a positive or negative path.

Since the attitudes with respect to a positive or negative path between performance and reward may be affected by many factors as indicated in Chapter Three regarding Relationships A and B the remaining hypotheses in this section are used to cover as many of these variables as were deemed important. These hypotheses will be analyzed using the Wilcoxon rank sum test to determine if differences exist between the groups, i.e., positive vs. negative path.

3- Is there a difference in perceptions regarding task and role characteristics between those who believe the performance report provides a positive path and those who perceive a negative path?

$$3) H_0: TRC_P = TRC_N$$

TRC_P = the task and role characteristics as perceived by those who believe the performance report provides a positive path

TRC_N = the task and role characteristics as perceived by those who believe the performance report provides a negative path

The responses to questions contained in the task and role characteristics section, except for the questions one,

nine, ten, eleven, twelve, thirteen, and fourteen, and the employee motivation questions, were utilized to determine if there was a difference in perceived task/role characteristics between those individuals who perceived the performance report to provide a positive path and those who perceived a negative path.

4- Is there a difference in the supervisory style of managers, as perceived by their subordinates, who judge the performance report to provide a positive path and those who judge it to provide a negative path?

$$4) H_0: SS_P = SS_N$$

SS_P = the supervisory style of managers (as perceived by their subordinates) who judged their performance report to provide a positive path

SS_N = the supervisory style of managers (as perceived by their subordinates) who judged their performance report to provide a negative path

The subordinates' responses to the supervisory style section, except for questions seven and eight, were analyzed to determine if there was a difference in the perceived supervisory style of managers who were in the positive path group vs. those who were in the negative path group with

respect to the performance report.

5- Is there a difference in the employee motivation exhibited by individuals who believe the performance report provides a positive path and those who believe it provides a negative path?

$$5) H_0: EM_P = EM_N$$

EM_P = the employee motivation reported by those who judged their performance report to provide a positive path

EM_N = the employee motivation reported by those who judged their performance report to provide a negative path

The responses to the employee motivation questions asked in the task and role characteristics section were investigated to determine if there was a difference in motivation between those who perceived their performance report to provide a positive path and those who perceived it to provide a negative path.

6- Is there a difference in the perceived job facets of individuals who judge their performance report to provide a

positive path and those who judge it to provide a negative path?

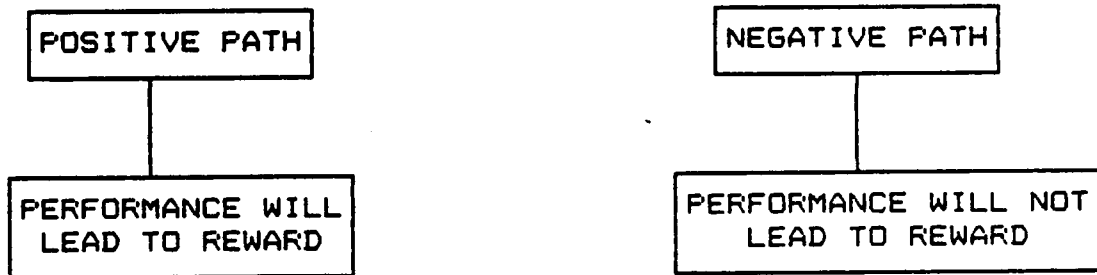
$$6) H_0: JF_P = JF_N$$

JF_P = the job facets as perceived by those who believe the performance report provides a positive path

JF_N = the job facets as perceived by those who believe the performance report provides a negative path

The responses to the questions asked in the job facets section were analyzed to determine if perceived differences existed with respect to job characteristics between those who were grouped as positive path and those who were grouped as negative path individuals.

RELATIONSHIP F



The positive and negative path groupings achieved in the analysis of Relationship E were utilized in conjunction with the respondents perceived pay-performance linkage, based on questions thirteen and fourteen in the task role characteristics section and question eleven in the pay section, to assess the following research question:

7- Is there a difference in the perceived pay-performance linkage between those individuals who deem their performance report to provide a positive path and those who deem it to provide a negative path?

$$7) H_0: \begin{matrix} PP \\ P \end{matrix} = \begin{matrix} PP \\ N \end{matrix}$$

PP_P = the pay-performance linkage reported by those who judged their performance report to provide a positive path

PP_N = the pay-performance linkage reported by those who judged their performance report to provide a negative path

The pay-performance linkage between the positive path and the negative path individuals were analyzed using the Wilcoxon rank sum test to determine if differences existed between the groups.

RELATIONSHIP G AND H



The classifications achieved in analyzing Relationship E, positive or negative path, and Relationship F, pay-performance linkage, were used together with the performance rankings, questions one and two of the performance section, to assess the following research questions:

8- Is there a difference in the performance of departments whose supervisors perceive the performance evaluation to provide a positive path and those who perceive it to provide a negative path?

$$8) \quad H_0: \quad PR_P = PR_N$$

PR = the performance of the departments whose P managers judged their performance report to provide a positive path

PR = the performance of the departments whose
 N managers judged their performance report to
 provide a negative path

9- Is there a difference in the performance of departments whose supervisors perceive a strong pay-performance linkage and those who perceive a weak pay-performance linkage?

9) H₀: PR = PR
 SPP WPP

PR = the performance of the departments whose
 SPP managers perceive there is a strong
 relationship between pay and performance

PR = the performance of the departments whose
 WPP managers perceive there is a weak
 relationship between pay and performance

The performance of departments was investigated in the above two hypotheses using the Wilcoxon rank sum test to determine if there were any differences in the performance of departments whose managers;

1. judged their performance report to provide a positive path and those who judged it to provide a negative path
2. perceived a strong relationship between pay and performance and those who judged the relationship to be weak

The performance of the departments was determined by

asking the superiors to rank their own performance as well as that of their subordinate departments.

Summary

The use of interviews and questionnaire items with demonstrated reliability and validity should enhance the construct validity of this study. Since the development of the theoretical model preceded the fieldwork and rigorous attention was paid to specifics in using the research design and individual case studies, the reliability for this study should be reasonably good. Furthermore, the administration of questionnaires, in addition to interviews and observation, and formal hypothesis testing should provide generalizability of the findings to the proposed theoretical model.

CHAPTER V- ANALYSIS AND INTERPRETATION OF RESULTS

Introduction

This study was designed to test the effectiveness of evaluating performance with performance report variances. It was hypothesized that those individuals who felt the performance report was equitable would have a positive path and deem the performance report instrumental to improving performance and increasing their reward which, in turn, would improve performance. On the other hand it was hypothesized that those individuals who felt the performance report was inequitable would have a negative path and deem the performance report not instrumental for improving performance and their reward; thus they would not strive to improve their performance.

The four plants studied, two from Company A and two from Company B, were part of the furniture industry within the same geographic area and therefore faced very similar external environments. Although the internal environments may have varied slightly it is the researcher's belief, based on interviews with corporate management and on-site visits, that the management styles of the plant managers were very similar and that the performance reports were used in essentially the same way for the same purpose, i.e., to evaluate performance and award bonuses. Furthermore,

the departments investigated tended to be production departments which were highly standardized and had used standard costs for some time. As a result, the management teams were very familiar with standards and variances.

These plants would also be considered to be under a tight monitoring system via the performance reports since corporate management received daily information and plant managers received daily and/or weekly information. Additionally, the plant managers held weekly meetings with their management teams to discuss the variances and other production problems. The atmosphere at these meetings was very warm and friendly, and seemed to employ a highly democratic and open process with respect to management problems.

Due to the similarities of the four plants the data was pooled for the statistical analysis of the hypotheses contained in this chapter. Since, however, the case methodology was employed to assess the reliability and validity of the results through replication, each plant was analyzed on an individual and pooled company basis before all of the data was pooled. The individual and pooled company results with respect to the hypotheses and additional tests can be found in Appendices F-I.

The following section presents the results of the statistical analysis pertaining to the hypotheses presented

in Chapter Four.

Hypothesis One

This hypothesis dealt with perceptions regarding the equitability of the performance report as related to its perceived importance (high or low use) for performance evaluation purposes. First the respondents were grouped on question 4, "my supervisor stresses the monthly production schedule (or variances from the allowed standard) when evaluating my performance" (all questions came from Appendix E). If the respondent answered between 1-3 on this question he was placed in the high use group, if on the other hand the respondent answered between 5-7 he was placed in the low use group. Individuals who responded to the question by answering N (neither agreed nor disagreed) were eliminated from this part of the analysis.

The two groups, high vs. low use, were then analyzed based on their responses to questions 26 (Q26A) and 33 (Q33A) using the Chi-Square test of independence (Table 1). Due to the small number of respondents within three cells the null hypothesis concerning questions 26 and 33 could not be accepted or rejected.

Since the superior in one instance is a subordinate in

TABLE ONE- HYPOTHESIS ONE, POOLED DATA

GROUP Q26A			
FREQUENCY	PERCENT	ROW PCT	COL PCT
	AGREE	DISAG	TOTAL
NIG	46 90.20 97.07 93.88	1 1.96 2.13 50.00	47 92.16
LOW	3 5.88 75.00 6.12	1 1.96 25.00 50.00	4 7.84
TOTAL	49 96.08	2 3.92	51 100.00

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	5.118	0.024
LIKELIHOOD RATIO CHI-SQUARE	1	2.698	0.100
CONTINUITY ADJ. CHI-SQUARE	1	0.848	0.357
MANTEL-MAENSZEL CHI-SQUARE	1	5.018	0.025
FISHER'S EXACT TEST (1-TAIL)			0.152
(2-TAIL)			0.152
PHI		0.317	
CONTINGENCY COEFFICIENT		0.302	
CRAMER'S V		0.317	

SAMPLE SIZE = 51
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

GROUP Q33A			
FREQUENCY	PERCENT	ROW PCT	COL PCT
	AGREE	DISAG	TOTAL
NIG	44 86.27 93.62 95.65	3 5.88 6.38 60.00	47 92.16
LOW	2 3.92 50.00 4.35	2 3.92 50.00 40.00	4 7.84
TOTAL	46 90.20	5 9.80	51 100.00

STATISTICS FOR TABLE OF GROUP BY Q33A

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	7.931	0.005
LIKELIHOOD RATIO CHI-SQUARE	1	4.858	0.028
CONTINUITY ADJ. CHI-SQUARE	1	3.765	0.052
MANTEL-MAENSZEL CHI-SQUARE	1	7.775	0.005
FISHER'S EXACT TEST (1-TAIL)			0.043
(2-TAIL)			0.043
PHI		0.394	
CONTINGENCY COEFFICIENT		0.367	
CRAMER'S V		0.394	

SAMPLE SIZE = 51
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

another and therefore independent observations do not exist no statistical test is available, known to this researcher, to make comparisons regarding their responses. The data gathered, however, contained several questions which may provide important insights regarding superior and subordinate perceptions which were analyzed visually. With respect to Hypothesis One the following two important questions were analyzed in this manner:

4. My supervisor stresses the monthly production schedule (or variances from the allowed standard) when evaluating my performance.
18. I emphasize the monthly production schedule (or variances from the allowed standard) when evaluating my subordinates' performance.

Matching the superior's response to question 18 against his subordinate's response to question 4 with respect to each plant suggests that, for the most part, superiors and subordinates were in agreement regarding the extent to which variances were used for evaluation purposes (for more information see Appendices F-I). The two negative path individuals, however, had mixed responses to these questions. One of the respondent's indicated that his supervisor did not use variances, for performance evaluation purposes, while his supervisor specified that he did use them. The other respondent and his supervisor were in agreement regarding the extent to which performance report

variances were used for performance evaluation purposes.

Additionally, looking at the individual responses to question 4 across all the plants revealed that, generally, individuals responded by answering 2 or 3 which implies that the performance report variances were perceived to be relied on by supervisors for performance evaluation purposes to a high degree. This finding supports Govindarajan's contention that in low uncertainty environments managers resort to the use of formula-based evaluation measures.¹³⁹

Reviewing the managers' responses to question 26 (performance report is a good way to measure my performance) denotes that they responded ordinarily with either a 1 or 2 which means they agreed with the statement. In light of the responses to questions 4 and 26 it appears reasonable to suggest that the performance report variance evaluation is an accepted method by superiors and subordinates and they considered it to be fair. These conclusions are in agreement with Bruns and Waterhouse's contention that if the evaluation methods are accepted and supported they will be viewed positively.¹⁴⁰

Hypothesis Two

Hypothesis two was concerned with the perceptions

¹³⁹ Govindarajan, V., op. cit., 1985.

¹⁴⁰ Bruns, W. and J. Waterhouse, op. cit., 1975.

regarding the equitability of the performance report with respect to whether or not the individual perceived a positive or negative path.

First the respondents were grouped according to their responses to questions 24 and 25:

24. The monthly production schedule (or the variances from the allowed standard) helps me figure out where I need to improve performance.

25. The monthly production schedule (or the variances from the allowed standard) helps me improve my performance.

If the respondent's answers to these questions totaled 7 or less he was placed in the positive path group and if the answers totaled 9 or more he was placed in the negative path group. A total of 8 indicated that the individual neither agreed nor disagreed and the individual was discarded from this part of the analysis. Next the two groups', positive and negative path, responses to questions 26 and 33 were analyzed using the Chi-Square test of independence (Table 2).

Due to the small number of respondents within three cells the null hypothesis concerning questions 26 and 33 could not be accepted or rejected.

A review of the managers' responses to question 33 (report fair), however, infers that, for the most part, they answered either 1 or 2 which means they agreed with the

TABLE TWO- HYPOTHESIS TWO, POOLED DATA

GROUP 026A				
FREQUENCY	PERCENT			
ROW PCT	COL PCT	AGREE	DISAG	TOTAL
NEG		1	0	1
	1.05	0.00		1.05
	100.00	0.00		
	1.00	0.00		
POS		52	1	53
	96.50	1.85		98.15
	98.11	1.89		
	98.11	100.00		
TOTAL		53	1	54
	98.15	1.85		100.00

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.019	0.890
LIKELIHOOD RATIO CHI-SQUARE	1	0.038	0.846
CONTINUITY ADJ. CHI-SQUARE	1	0.000	1.000
MANTEL-HAENSZEL CHI-SQUARE	1	0.019	0.891
FISHER'S EXACT TEST (1-TAIL)			0.981
(2-TAIL)			1.000
PHI		0.019	
CONTINGENCY COEFFICIENT		0.019	
CRAMER'S V		0.019	

SAMPLE SIZE = 54
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

GROUP 033A				
FREQUENCY	PERCENT			
ROW PCT	COL PCT	AGREE	DISAG	TOTAL
NEG		1	0	1
	1.85	0.00		1.85
	100.00	0.00		
	2.04	0.00		
POS		48	5	53
	88.89	9.26		98.15
	90.57	9.43		
	97.96	100.00		
TOTAL		49	5	54
	98.74	9.26		100.00

STATISTICS FOR TABLE OF GROUP BY 033A

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.104	0.747
LIKELIHOOD RATIO CHI-SQUARE	1	0.196	0.658
CONTINUITY ADJ. CHI-SQUARE	1	0.000	1.000
MANTEL-HAENSZEL CHI-SQUARE	1	0.102	0.749
FISHER'S EXACT TEST (1-TAIL)			0.907
(2-TAIL)			1.000
PHI		0.044	
CONTINGENCY COEFFICIENT		0.044	
CRAMER'S V		0.044	

SAMPLE SIZE = 54
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

statement, i.e., they perceived the performance report to be equitable. Additionally, scanning questions 43 (satisfaction with the performance report), 29 (importance of the performance report), and 53 (importance of the performance report for pay) reveals that managers across plants, usually, assigned high values, such as 5, 6, or 7 to these questions. These comparisons suggest that the managers viewed the performance report as fair; they were satisfied with it; and they believed it was important to them and their pay. Thus, it appears that the goals being put forth by the performance report are perceived to be fair, important, accepted, and understood by managers in these plants. As Locke suggests positive attitudes toward the performance evaluation method will affect performance attitudes positively.¹⁴¹

Hypothesis Three

Hypothesis three dealt with the perceived differences regarding task role characteristics amongst those individuals who perceived a positive path and those who perceived a negative path.

The classifications formed for hypothesis two, positive path vs. negative path, were analyzed using the Wilcoxon rank sum test with respect to questions 5, 7, 8, 9, 10, 11,

¹⁴¹ Locke, E., op. cit., 1968.

14, and 23 (Table 3). The null hypothesis could not be rejected based on the responses to any of these questions. Therefore, the task role characteristics do not appear to affect the individual's perception of a negative or positive path as related to the performance report variances.

Examining the managers' responses to questions 8 (goals), 9 (understand goals), and 10 (goals fair) indicated that the responses across plants tended to be either 1's or 2's which suggests that the managers agreed with these statements. As Kenis maintains goal clarity seems to be important to job satisfaction and attitudes toward the performance evaluation measure.¹⁴² Thus, it would appear that the performance reports being used by these companies are considered by their employees to communicate the goals clearly and be fair. This perception relative to the theoretical model should result in a positive path which was supported since the overwhelming number of respondents in this study indicated a positive path.

Hypothesis Four

Hypothesis four dealt with the supervisory style which was perceived to be used by those individuals who deemed the performance report to provide a positive path and those who deemed it to provide a negative path.

¹⁴² Kenis, I., op. cit., 1979.

TABLE THREE- HYPOTHESIS THREE, POOLED DATA

ANALYSIS FOR VARIABLE 010 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	7	34.00	18.00	7.67
POS	65	2224.00	2210.00	24.67

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z = 34.00 Z-c 0.5475 PROB >|Z| = 0.9042
 T-TEST APPROX. SIGNIFICANCE = 0.9046
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30 = 0.32 DF = 1 PROB > CHI30 = 0.5760

ANALYSIS FOR VARIABLE 010 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	64	2271.00	2245.00	17.30
NEG	1	57.00	34.00	17.30

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z = 37.00 Z-c 1.5083 PROB >|Z| = 0.1939
 T-TEST APPROX. SIGNIFICANCE = 0.1900
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30 = 1.77 DF = 1 PROB > CHI30 = 0.1830

ANALYSIS FOR VARIABLE 011 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	64	2227.50	2244.00	18.47
POS	1	33.50	34.00	18.47

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z = 33.50 Z-c 1.1369 PROB >|Z| = 0.2554
 T-TEST APPROX. SIGNIFICANCE = 0.2597
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30 = 1.15 DF = 1 PROB > CHI30 = 0.2844

ANALYSIS FOR VARIABLE 023 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	72.50	49.00	26.11
POS	46	2273.50	2277.00	26.11

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z = 72.50 Z-c 0.3169 PROB >|Z| = 0.0005
 T-TEST APPROX. SIGNIFICANCE = 0.0009
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30 = 0.02 DF = 1 PROB > CHI30 = 0.8934

TABLE THREE- continued

ANALYSIS FOR VARIABLE 05 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	57.00	69.00	25.91
POS	66	2269.00	2277.00	25.91

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S₀ = 97.00 Z = -0.4439 PROB >|Z| = 0.6571

T-TEST APPROX. SIGNIFICANCE = 0.6805

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI SQ = 0.21 Df = 1 PROB > CHI SQ = 0.6432

ANALYSIS FOR VARIABLE 08 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	69.00	69.00	25.00
POS	66	2277.00	2277.00	25.00

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S₀ = 69.00 Z = 0.0195 PROB >|Z| = 0.9845

T-TEST APPROX. SIGNIFICANCE = 0.9845

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI SQ = 0.00 Df = 1 PROB > CHI SQ = 1.0000

ANALYSIS FOR VARIABLE 07 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	99.00	69.00	23.09
POS	66	2267.00	2277.00	23.09

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S₀ = 99.00 Z = 1.2778 PROB >|Z| = 0.2013

T-TEST APPROX. SIGNIFICANCE = 0.2057

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI SQ = 1.60 Df = 1 PROB > CHI SQ = 0.1958

ANALYSIS FOR VARIABLE 09 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	96.00	69.00	24.57
POS	66	2250.00	2277.00	24.57

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S₀ = 96.00 Z = 1.0786 PROB >|Z| = 0.2807

T-TEST APPROX. SIGNIFICANCE = 0.2846

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI SQ = 1.21 Df = 1 PROB > CHI SQ = 0.2717

The positive and negative groups were compared with respect to questions 1, 2, 3, 6, 12, 13, 15, 16, 17, 19, 20, 21, and 32 using the Wilcoxon rank sum test (Table 4). The null hypothesis could not be strongly rejected except for question 15 (.0422). The results of the analysis on question 15 indicated that those individuals who perceived a negative path also tended to disagree with the statement that their supervisor asked for advice when making decisions that concerned them.

Question 16 (.0632), and question 20 (.07), also seem to indicate that some relationship exists. Regarding question 16, it appears that those individuals who perceived a negative path were more likely to agree strongly with the statement that they had a chance to take part in deciding what the work methods, procedures, and goals would be on their job.

Additionally, the individuals who perceived a negative path also inferred that the company did not set high performance goals (Q 20). On the other hand the positive group generally indicated that the company did set high performance goals. Thus, it appears that the perceived supervisory style has some impact, although limited, on the individual's perception of a negative or positive path associated with the performance report variances.

TABLE FOUR- HYPOTHESIS FOUR, POOLED DATA

ANALYSIS FOR VARIABLE Q1 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCORON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	78.50	69.00	25.63
P05	66	2275.50	2277.00	25.63

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 78.50 Z= 0.9398 PROB >|Z|=0.9669
 T-TEST APPROX. SIGNIFICANCE=0.9690
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.00 DF= 1 PROB > CHI30=0.9533

MILCORON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	76.50	69.00	25.67
P05	66	2269.50	2277.00	25.67

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 76.50 Z= 0.2726 PROB >|Z|=0.7681
 T-TEST APPROX. SIGNIFICANCE=0.7660
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.09 DF= 1 PROB > CHI30=0.7702

ANALYSIS FOR VARIABLE Q2 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCORON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	109.50	69.00	24.92
P05	66	2236.50	2277.00	24.92

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 109.50 Z= 1.6051 PROB >|Z|=0.1005
 T-TEST APPROX. SIGNIFICANCE=0.1132
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 2.66 DF= 1 PROB > CHI30=0.1041

ANALYSIS FOR VARIABLE Q4 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCORON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	60.50	69.00	24.55
P05	66	2205.50	2277.00	24.55

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 60.50 Z= -0.3259 PROB >|Z|=0.7448
 T-TEST APPROX. SIGNIFICANCE=0.7455
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.12 DF= 1 PROB > CHI30=0.7291

TABLE FOUR- continued

ANALYSIS FOR VARIABLE Q12 CLASSIFIED BY VARIABLE GROUP ANALYSIS FOR VARIABLE Q13 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES AVERAGE SCORES WERE USED FOR TIES

MILCORON SCORES (RANK SUMS)		MILCORON SCORES (RANK SUMS)	
LEVEL	N	SUM OF SCORES UNDER HQ	EXPECTED UNDER HQ
MEQ	2	98.00	69.00
POS	66	2248.00	2277.00

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 98.00 Z= 1.1079 PROB >|Z|=0.2369
 T-TEST APPROX. SIGNIFICANCE=0.2410
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 1.43 DF= 1 PROB > CHI30=0.228

ANALYSIS FOR VARIABLE Q13 CLASSIFIED BY VARIABLE GROUP ANALYSIS FOR VARIABLE Q16 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES AVERAGE SCORES WERE USED FOR TIES

MILCORON SCORES (RANK SUMS)		MILCORON SCORES (RANK SUMS)	
LEVEL	N	SUM OF SCORES UNDER HQ	EXPECTED UNDER HQ
MEQ	2	88.50	69.00
POS	66	2189.50	2277.00

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 88.50 Z= 0.7925 PROB >|Z|=0.4282
 T-TEST APPROX. SIGNIFICANCE=0.4310
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.66 DF= 1 PROB > CHI30=0.4167

MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 28.00 Z=-1.8377 PROB >|Z|=0.0632
 T-TEST APPROX. SIGNIFICANCE=0.0676
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 3.32 DF= 1 PROB > CHI30=0.0668

TABLE FOUR- continued

ANALYSIS FOR VARIABLE Q21 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCROM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER MO
MEU	2	74.00	25.81
POS	66	2272.00	25.81

MILCROM 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 74.00 Z= 0.1743 PROB >|Z|=0.8616

T-TEST APPROX. SIGNIFICANCE=0.8621
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.86 Df= 1 PROB > CHISQ=0.8644

ANALYSIS FOR VARIABLE Q22 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCROM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER MO
MEU	2	98.50	24.69
POS	66	2297.50	24.69

MILCROM 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 98.50 Z= 0.8101 PROB >|Z|=0.4179

T-TEST APPROX. SIGNIFICANCE=0.4200
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.69 Df= 1 PROB > CHISQ=0.4864

ANALYSIS FOR VARIABLE Q17 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCROM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER MO
MEU	2	74.50	23.48
POS	66	2271.50	23.48

MILCROM 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 74.50 Z= 0.2111 PROB >|Z|=0.8320

ANALYSIS FOR VARIABLE Q19 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCROM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER MO
MEU	2	81.00	24.77
POS	66	2265.00	24.77

MILCROM 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 81.00 Z= 0.6643 PROB >|Z|=0.6424

ANALYSIS FOR VARIABLE Q20 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCROM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER MO
MEU	2	113.50	24.94
POS	66	2232.50	24.94

MILCROM 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 113.50 Z= 1.7644 PROB >|Z|=0.0777

Hypothesis Five

Hypothesis five compared the motivation of individuals who perceived a positive path to the motivation of those individuals who perceived a negative path.

The positive and negative groups were compared with respect to questions 29, 30, 31, 36, and 37 using the Wilcoxon rank sum test (Table 5). Only Question 37 (.0939), however, seems to signify that some relationship exists. Individuals who perceived a negative path responded that they were less concerned about the performance report variances than those individuals who were on a positive path.

A review of the responses to questions 29, 30, 31, 36, and 37 reveals that managers across plants usually assigned a value of 1 or 2 to these questions suggesting high amounts of motivation. Assessing these motivation responses can be better understood by incorporating the responses to question 16 (participation), also generally answered with either a 1 or 2 which implies they felt they were participating, and question 4 to which they reported high use of the performance report. These results suggest that high amounts of motivation were associated with perceptions of participation and importance of the performance report. This conclusion is also supported by prior research findings

TABLE FIVE- HYPOTHESIS FIVE, POOLED DATA

ANALYSIS FOR VARIABLE 029 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES				ANALYSIS FOR VARIABLE 031 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES			
MILCORON SCORES (NAME SUMS)				MILCORON SCORES (NAME SUMS)			
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	510 DEV UNDER H0	LEVEL	N	SUM OF SCORES
ME0	2	67.00	69.00	24.20	ME0	2	69.00
POS	66	2270.00	2277.00	24.20	POS	65	2289.00
MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z= -0.0420 PROB > Z =0.9306				MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z= 0.0212 PROB > Z =0.9831			
T-TEST APPROX. SIGNIFICANCE=0.9306				ANALYSIS FOR VARIABLE 036 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES			
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI2=0 0.01 DF= 1 PROB > CHI2=0.9341				MILCORON SCORES (NAME SUMS)			
ANALYSIS FOR VARIABLE 030 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES				ANALYSIS FOR VARIABLE 037 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES			
MILCORON SCORES (NAME SUMS)				MILCORON SCORES (NAME SUMS)			
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	510 DEV UNDER H0	LEVEL	N	SUM OF SCORES
ME0	2	67.00	69.00	22.33	ME0	2	66.00
POS	66	2269.00	2277.00	22.33	POS	66	2288.00
MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z= -0.0630 PROB > Z =0.9335				MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z= -0.1033 PROB > Z =0.9177			
T-TEST APPROX. SIGNIFICANCE=0.9330				ANALYSIS FOR VARIABLE 037 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES			
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI2=0 0.07 DF= 1 PROB > CHI2=0.9266				MILCORON SCORES (NAME SUMS)			
ANALYSIS FOR VARIABLE 038 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES				ANALYSIS FOR VARIABLE 037 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES			
MILCORON SCORES (NAME SUMS)				MILCORON SCORES (NAME SUMS)			
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	510 DEV UNDER H0	LEVEL	N	SUM OF SCORES
ME0	2	67.00	69.00	24.47	ME0	2	110.50
POS	66	2269.00	2277.00	24.47	POS	66	2235.50
MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z= 0.0707 PROB > Z =0.9258				MILCORON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z= 1.0733 PROB > Z =0.8038			

which contended that high usage of performance evaluation measures and increased participation were related to positive motivation.¹⁴³

Hypothesis Six

Hypothesis six compared the perceived job facets of those individuals in the positive path group against those in the negative path group.

The positive and negative classifications were compared based on the responses to questions 34, 35, and 38 - 52 using the Wilcoxon rank sum test (Table 6). The null hypothesis could not be rejected except for question 35. Those individuals denoting a negative path tended to perceive that the amount of their year-end bonus was not determined by the performance report variances while those on the positive path indicated the opposite.

Hypothesis Seven

Hypothesis seven dealt with the pay-performance linkage perceived by individuals who reported a positive path and those who reported a negative path.

The positive and negative groups were compared with respect to questions 27 and 28 using the Wilcoxon rank sum

¹⁴³ Collins, F., R. Seiler, and D. Clancy, op. cit., 1984; Searfoss, D., op. cit., 1976; Searfoss, D. and R. Monczka, op. cit., 1973.

TABLE SIX- HYPOTHESIS SIX, POOLED DATA

ANALYSIS FOR VARIABLE Q34 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	99.50	49.00	23.41
POS	66	2244.50	2277.00	23.41

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z= 99.50 Z= 1.2010 PROB >|Z|=0.1999
 T-TEST APPROX. SIGNIFICANCE=0.2043
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.70 DF= 1 PROB > CHISQ=0.1923

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	44.00	49.00	22.60
POS	66	2202.00	2277.00	22.60

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z= 44.00 Z= 0.1905 PROB >|Z|=0.0427
 T-TEST APPROX. SIGNIFICANCE=0.8433
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.05 DF= 1 PROB > CHISQ=0.8255

ANALYSIS FOR VARIABLE Q35 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	120.50	69.00	23.67
POS	66	2223.50	2277.00	23.67

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z= 120.50 Z= 1.9847 PROB >|Z|=0.0470
 T-TEST APPROX. SIGNIFICANCE=0.0310
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 4.02 DF= 1 PROB > CHISQ=0.0440

ANALYSIS FOR VARIABLE Q39 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	2	41.00	49.00	24.04
POS	66	2305.00	2277.00	24.04

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z= 41.00 Z= -1.1930 PROB >|Z|=0.2881
 T-TEST APPROX. SIGNIFICANCE=0.2371
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.35 DF= 1 PROB > CHISQ=0.2440

TABLE SIX- continued

ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 042 CLASSIFIED BY VARIABLE GROUP					
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES					
MILCOBON SCORES (RANK SUMS)				MILCOBON SCORES (RANK SUMS)					
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	59.50	69.00	20.45	NEG	2	59.00	69.00	26.70
POS	66	2270.50	2277.00	20.45	POS	66	2267.00	2277.00	26.70
MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5)				MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5)					
Z = 58.90 Z = -0.6358 PROB > Z = 0.5249				Z = 59.00 Z = -0.3546 PROB > Z = 0.7229					
T-TEST APPROX. SIGNIFICANCE = 0.5270				T-TEST APPROX. SIGNIFICANCE = 0.7240					
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI SQ = 0.40 DF = 1 PROB > CHI SQ = 0.5091				KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI SQ = 0.14 DF = 1 PROB > CHI SQ = 0.7040					
ANALYSIS FOR VARIABLE 041 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 043 CLASSIFIED BY VARIABLE GROUP					
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES					
MILCOBON SCORES (RANK SUMS)				MILCOBON SCORES (RANK SUMS)					
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	2	77.00	69.00	15.41	NEG	2	59.00	69.00	26.37
POS	66	2269.00	2277.00	15.41	POS	66	2267.00	2277.00	26.37
MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5)				MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5)					
Z = 77.00 Z = 0.6668 PROB > Z = 0.6264				Z = 59.00 Z = -0.3683 PROB > Z = 0.7160					
T-TEST APPROX. SIGNIFICANCE = 0.6200				T-TEST APPROX. SIGNIFICANCE = 0.7190					
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI SQ = 0.27 DF = 1 PROB > CHI SQ = 0.6036				KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI SQ = 0.14 DF = 1 PROB > CHI SQ = 0.7040					

TABLE SIX-- continued

ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 030 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
MEQ	2	61.00	49.00	MEQ	2	32.50	49.00
POS	66	2285.00	2277.00	POS	66	2293.50	2277.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 61.00 Z=0.3117 PROB > Z =0.7592				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 52.50 Z=-0.7253 PROB > Z =0.4603			
T-TEST APPROX. SIGNIFICANCE=0.7542				ANALYSIS FOR VARIABLE 031 CLASSIFIED BY VARIABLE GROUP			
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHISQ= 0.11 DF= 1 PROB > CHISQ=0.7395				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
MEQ	2	49.00	49.00	MEQ	2	45.50	49.00
POS	66	2298.00	2277.00	POS	66	2300.50	2277.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 49.00 Z=-0.8920 PROB > Z =0.3720				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 45.50 Z=-1.0770 PROB > Z =0.2018			
T-TEST APPROX. SIGNIFICANCE=0.3752				ANALYSIS FOR VARIABLE 032 CLASSIFIED BY VARIABLE GROUP			
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHISQ= 0.64 DF= 1 PROB > CHISQ=0.3604				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
MEQ	2	51.00	49.00	MEQ	2	51.00	49.00
POS	66	2295.00	2277.00	POS	66	2295.00	2277.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 51.00 Z=-0.8059 PROB > Z =0.4203				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 51.00 Z=-0.8059 PROB > Z =0.4203			

test (Table 7). The null hypothesis could not be rejected regarding either of the questions. The results of this analysis seem to imply that the perceived strength of the pay-performance linkage is not affected by the individual's perception of a negative or positive path.

Hypothesis Eight

Hypothesis eight investigated the perceived performance (self-reported) of managers who were on the positive path against those who were on the negative path.

The positive and negative groups were compared with respect to question 61 using the Wilcoxon rank sum test (Table 8). Since the p value was equal .0562 it suggests that the perceived performance differs between those on the positive or negative path. Concerning question 61, a visual inspection of the data reveals that those individuals on the negative path tended to rank their performance as average, while those on the positive path tended to rank their performance above average.

Hypothesis Nine

Hypothesis nine compared the perceived performance of those managers who reported a strong pay-performance linkage against those who reported a weak pay-performance linkage.

TABLE SEVEN- HYPOTHESES SEVEN, POOLED DATA

ANALYSIS FOR VARIABLE 027 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	MEAN SCORE
NEO	2	102.50	69.00	24.17	51.25
POS	66	2243.50	2277.00	24.17	33.99

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 102.50 Z= 1.3693 PROB >|Z|=0.1722

T-TEST APPROX. SIGNIFICANCE=0.1767

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.92 DF= 1 PROB > CHISQ=0.1658

ANALYSIS FOR VARIABLE 028 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	MEAN SCORE
NEO	2	72.50	69.00	26.00	36.25
POS	66	2273.50	2277.00	26.00	34.45

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 72.50 Z= 0.1154 PROB >|Z|=0.9081

T-TEST APPROX. SIGNIFICANCE=0.9085

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.02 DF= 1 PROB > CHISQ=0.8929

TABLE EIGHT- HYPOTHESES EIGHT, POOLED DATA

ANALYSIS FOR VARIABLE 061 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	2	19.00	67.00	24.87	9.50
POS	64	2192.00	2144.00	24.87	34.25

MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 19.00 Z=-1.9097 PROB >|Z|=0.0562

T-TEST APPROX. SIGNIFICANCE=0.0606

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 3.72 DF= 1 PROB > CHISQ=0.0536

First the respondents were grouped according to their pay-performance linkage based on the following questions :

27. If I do a better on my monthly production schedule (or I improve on the variances allowed from the standard) my salary and or bonus will increase.
28. I can use the monthly production schedule (the variances allowed from the standard) to improve my performance and increase my salary and or bonus.

Those individuals whose answers totaled 7 or less were classified as the strong pay-performance group (SPP), and those whose answers totaled 9 or more were classified as the weak pay-performance group (WPP). Individuals whose answers totaled 8, indicating that they neither agreed nor disagreed with these statements were dropped from this part of the analysis.

The two groups, SPP and WPP, were compared with respect to questions 61 and 62 using the Wilcoxon rank sum test (Table 9). The null hypothesis could not be rejected for either of the questions.

Reviewing the responses of the negative path individuals, however, provides some information of additional interest. One of the individuals perceived a WPP linkage and also reported he was dissatisfied with his pay (question 44), and was not likely to get a bonus (question 46). This response would be anticipated theoretically since an individual with a WPP linkage would not be expected to

TABLE NINE- HYPOTHESES NINE, POOLED DATA

ANALYSIS FOR VARIABLE 061 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	61	2077.00	2104.50	45.73	34.05
MPP	7	269.00	241.50	45.73	38.43

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 269.00 Z= 0.5904 PROB >|Z|=0.5549

T-TEST APPROX. SIGNIFICANCE=0.5569

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.36 DF= 1 PROB > CHISQ=0.5476

ANALYSIS FOR VARIABLE 06200 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	62	2122.50	2170.00	47.35	34.23
MPP	7	292.50	245.00	47.35	41.79

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 292.50 Z= 0.9926 PROB >|Z|=0.3209

T-TEST APPROX. SIGNIFICANCE=0.3244

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.01 DF= 1 PROB > CHISQ=0.3158

perceive a strong connection between pay based on the performance report variances and performance.

The other negative path individual, however, seemed to switch paths since he indicated that he had a SPP linkage. This response seems unusual since the company was basing pay on the performance report variances and this individual did not seem to perceive that relationship, i.e., was on a negative path, but did perceive a strong relationship between pay and performance. It is possible that this individual believes that the company is not using the variances in fact to reward performance.

Selecting the highest performing departments, as signified by the plant manager (response to Q 62 of 5), and then matching the perceived pay-performance linkage of the departments' supervisors reveals that they responded to questions 27 and 28 with either 1's or 2's which infers they had a SPP linkage. This finding is in agreement with Cherrington and Cherrington's research which concluded that the best performers perceived a strong relationship between good performance and the attainment of the reward.¹⁴⁴

Summary of the Results

Although the hypotheses for research questions one and two could neither be accepted nor rejected due to the lack

¹⁴⁴ Cherrington, D. and J. Cherrington, op. cit., 1973.

of observations in certain cells reviewing some of the responses to the questions does give an indication of the relationships that seem to exist. Generally the superiors and subordinates were in agreement regarding the extent to which performance report variances were used.

Additionally, a Randomized Complete Block (RCB) design was used to investigate whether the performance rankings (Q62) assigned differed across managerial levels. This method was employed since previous questions regarding managerial level differences could not be assessed due to limited data and nonindependent observations. Enough data existed within this instance, however, to employ the RCB using managerial levels as the treatments and blocking on departments. The results of this analysis revealed that in most instances the performance rankings assigned for each department by the superior and the subordinate did not differ significantly (Appendices F-I).

Next a RCB design analysis was utilized pertaining to questions 1-53, again the departments served as blocks and the managerial levels were the treatments. The results suggest that a great deal of agreement existed with respect to the responses on the questionnaire items. Additionally the data was analyzed with Duncan's Multiple Range Test to determine where differences existed (Appendices F-I). As one might expect the differences in attitudes which occurred

were more noticeable if the managerial levels were farther removed from each other, i.e., plant manager vs. assistant departmental supervisor, then when they tended to be closer in the hierarchy such as departmental and assistant supervisor. Thus, it appears that the management groups in these plants are relatively homogeneous with respect to their attitudes.

The null hypotheses for research questions three (task role characteristics), five (motivation), seven (pay-performance linkage), eight (self reported performance), and nine (SPP vs. WPP) could not be rejected.

Reviewing the responses of the negative path individuals, on questions which approached statistical significance, does suggest that they tended to assign themselves a ranking which was somewhat different from the positive path groups since the p value equalled .0562. Those individuals on the negative path also reported a difference relative to the performance report variances since the p value was equal to .0939, i.e., they were less concerned with it than their counterparts.

The analysis of research question four, supervisory style, received some support since question fifteen rejected the null hypothesis at p equal to .0422, indicating that those individuals on the negative path perceived their

supervisor to ask for less advice. There were also some differences with respect to questions 16 (p .0632) and 20 (p .07) which implied that those on the negative path felt that they participated but that the company did not set high performance goals.

The analysis of hypothesis six (job facets) could not be rejected except for question 35. That is, the individuals on the negative path, unlike their counterparts on the positive path, signified that the amount of their year-end bonus was not determined by the performance report variances (Q35).

Interpretation of Results

These results appear to imply that the use of performance report variances to communicate information regarding performance is working reasonably well in these plants. Although the flow of the performance report information is constructed in a manner which maximizes the flow of information upward and minimizes the flow downward as has been suggested by prior research¹⁴⁰ it does not seem to have hampered the efficiency of the communication with respect to performance. Furthermore, the managers seem to be, for the most part, well aware that their bonus is tied

¹⁴⁰ Markus, M. and J. Pfeffer, op. cit., 1983.

to controlling the performance report variances. Therefore, it is not surprising that 66 out of the 68 respondents were classified as having a positive path in relation to the performance report variances, i.e., they do not perceive the performance report to be a barrier to obtaining the reward (bonus).

Those individuals on a negative path, also perceived some differences regarding supervisory style. This finding is, however, supported by research previously cited by House since one of the roles of the leader is to clarify the path.¹⁴⁴ In this study, apparently for the negative path individuals the supervisor was not helping them understand the importance of the performance report variances and their impact on bonus and pay.

As was suggested in Chapter Three, the more predictable or standardized a task the more management accounting data will be able to measure the task performance. Since the tasks, of the managers who responded to this questionnaire, have been subject to standards for several years and are relatively predictable it stands to reason that most of them would fall into the positive path category. These favorable attitudes toward the performance report evaluation system are also in line with prior research which indicated that the frequency and clarity of the feedback was associated

¹⁴⁴ House, R., op. cit., 1971.

with positive job performance¹⁴⁷ and positive attitudes.¹⁴⁸

Although the research findings suggest some support for the theoretical model, the implications must, however, be interpreted cautiously due to the small number of respondents involved. The chi-square tests of independence provide little insight due to the lack of cells or the small number in several cells. Since the Wilcoxon rank sum tests were performed with only two individuals in the negative path group and sixty-six in the positive path group, it is difficult to determine how representative the negative path individuals' perceptions are in general.

A discussion of these results in comparison to Hopwood, Otley, and Brownell's findings is presented in the next chapter along with the study's limitations and avenues for future research.

¹⁴⁷ Lawler E., op. cit., 1976.

¹⁴⁸ Hofstede, G., op. cit., 1968.

CHAPTER 6- DISCUSSION OF RESEARCH RESULTS, LIMITATIONS AND AVENUES FOR FOR FUTURE STUDY

Introduction

The purpose of this chapter is to compare the study's results, with respect to Hopwood, Otley and Brownell's studies, along with its limitations and implications for future research. Since the previous studies left open the question of whether or not the use of accounting data promotes functional or dysfunctional behavior, the results of this research provide a significant contribution with respect to clarifying the earlier studies' findings.

Discussion

Hopwood's research indicated that evaluation methods which focused on the budget were believed to be less fair by managers. Additionally, those managers who were evaluated under constrained budget styles experienced less favorable relations with superiors and subordinates, misunderstood the importance of the budget in their performance evaluation, and experienced less goal clarity.¹⁴⁹ Otley, like Hopwood, found that there appeared to be a lack of congruence between middle and lower level managers' perceptions regarding how

¹⁴⁹ Hopwood, A., op. cit., 1972.

they were evaluated and upper level managers' perceptions of how they evaluated performance.

Furthermore, Otley found that managers who disagreed with the appropriateness of the evaluation being used reported increased job tension, and managers who were evaluated under the constrained budget style experienced more job ambiguity. Brownell's study indicated that high performance was associated with decreased budget emphasis, and increased budget emphasis resulted in increased job satisfaction.

The results of the research contained in this dissertation tend to confirm and/or disconfirm many of these previous findings. The use of performance reports were perceived to be fair by the managers in this study unlike those in Hopwood's. Additionally, the use of the performance reports for evaluation purposes did not result in less favorable relations between superiors and subordinates. This may be due to the fact that the managers in this study, unlike those in Hopwood's, agreed regarding the importance attached to the performance report with respect to their performance evaluation. The managers in this study also agreed that the performance report variances were used to determine their bonus and salary, and for the most part indicated a high use of the performance report.

Unlike Otley's results this study indicated that

superiors and subordinates were well aware of how they were evaluated and how they evaluated their subordinates. Additionally, the managers in this study felt that the performance report was an appropriate way to measure their performance. Since they believed the performance report was appropriate and equitable this may be the reason that these managers, unlike Hopwood and Otley's, did not perceive their jobs or goals to be ambiguous. The current study, like Brownell's, found that the use of the performance report for performance evaluation purposes was satisfactory to the managers.

Possible Implications

In general, the results of this study combined with the prior findings would seem to indicate that the use of performance report variances for evaluation purposes promotes functional behavior under the following circumstances:

1. Managers are in agreement regarding how they evaluate and how they are evaluated
2. The performance report is perceived of as appropriate and fair
3. Managers understand that their reward is tied to their performance as indicated by the performance report variances, i.e., they understand the importance attached to the performance report variances
4. The jobs or goals promoted by the performance report are not ambiguous

Thus, it appears that the communication process is crucial to the success of using performance report variances for the promotion of functional behavior, i.e., effective performance. These generalizations would appear to be reliable from the standpoint that the plants' data were analyzed on an individual basis with essentially the same results four times.

These possible implications are also supported by the work of previous researchers who found that organizational performance was positively related to the acceptance of the performance evaluation measures employed,¹⁵⁰ and the more the variances were perceived to be used in performance evaluation the higher the positive motivation.¹⁵¹

Limitations

A major limitation of this study was the small number of respondents on the negative path. As a result, little can be said regarding the generalizability of the negative path individuals' responses. These individuals did, however, indicate that they had less favorable relations with supervisors and felt the performance report variances were not as important in determining their bonus as compared to individuals on the positive path.

¹⁵⁰ Bruns, W. and J. Waterhouse, op. cit., 1975.

¹⁵¹ Collins, F., R. Seiler, and D. Clancy, op. cit., 1984.

Another limitation is that comparisons between supervisors' perceptions and subordinates' perceptions had to be done visually rather than analyzed statistically. Since a superior in one instance is a subordinate in another (not independent observations) to my knowledge there exists no statistical technique to analyze such data.

Additionally, many of the null hypotheses could not be rejected. This may have been due to the fact that the variables were not defined narrowly enough. It appears that many of the questions did not have any impact upon the determination of a positive or negative path. The variables which would have no influence, however, would have been difficult to determine prior to the study. The wealth of questions did allow the researcher to see where similarities and differences existed with regard to a variety of dimensions and make several interpretations which would not have been possible without the additional data.

Contribution and Avenues for Future Study

A major contribution of this research is the development of a theoretical model of the expected behavior of managers who were evaluated using performance report variances. Based on the results of this study it seems reasonable to suggest that the positive side of the model appears to have been working as hypothesized. Thus, it would appear useful for future researchers in this area to develop and employ

theoretical models.

Additionally, it appears that conflicting results from prior research may have been due, in part at least, from different meanings attached to the word "budget". Based on the results of this research it seems reasonable to suggest that future researchers should attempt to define the measure of interest, such as performance report variances, as narrowly as possible to insure that respondents are addressing the area that is of interest to the researcher.

Furthermore, based on the results of this study it also seems reasonable to suggest that future researchers try to more narrowly define the variables which affect the performance report.

Although this research has important implications for the use of accounting performance evaluation measures, such as insuring that the information is communicated adequately, goals are unambiguous, and management is in agreement regarding their use, much work is still left to be done.

A possible avenue for future research might be to take the theoretical model developed in this dissertation and work backwards. Since this study's results indicate that there are positive and negative paths associated with the performance report variances a questionnaire could be designed and administered in an organization to separate those individuals who indicate a positive path and those who

indicate a negative path. Once these two groups were segregated, questionnaires could be designed to ascertain what items with respect to the performance report might cause an individual to have a negative path or positive path.

Additionally, more work needs to be done regarding the effectiveness of various methods of communicating the performance report information and the impact of leadership styles on the acceptance or rejection of the performance report variances.

Information provided by this type of research is important since it will provide feedback for companies in terms of how to communicate their evaluation techniques effectively. Additionally, it will help companies with respect to the types of evaluations which should be used to promote improved performance.

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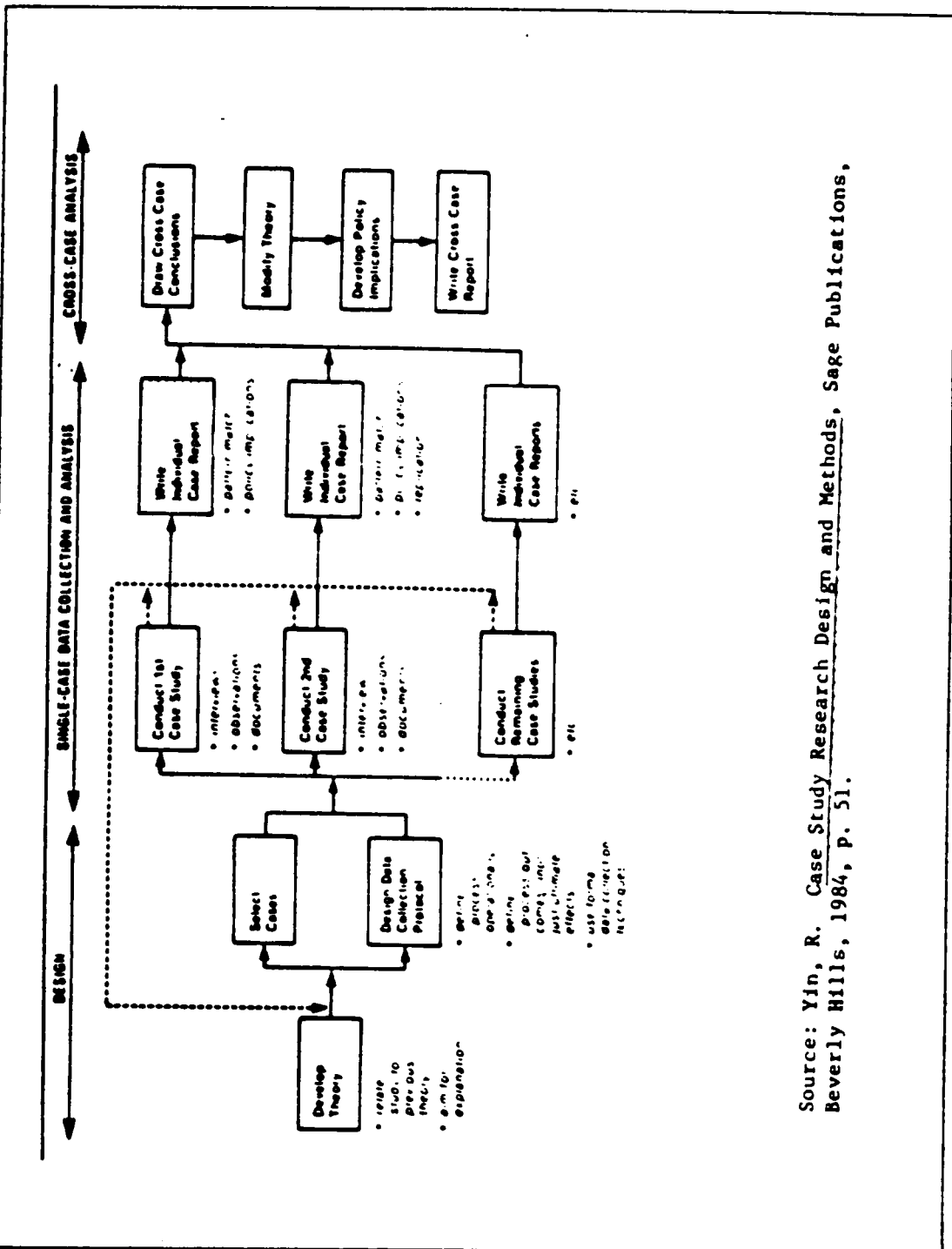
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APPENDIX A- CASE STUDY DESIGN FLOWCHART

CASE STUDY DESIGN FLOWCHART



Source: Yin, R. Case Study Research Design and Methods, Sage Publications, Beverly Hills, 1984, p. 51.

APPENDIX B- PRE-INTERVIEW PACKAGE

Dear _____,

I am a Ph.D. student, in accounting, at Virginia Polytechnic Institute and am writing you at the suggestion of _____ who indicated that your company might be interested in participating in a study that I am conducting. My study focuses on the effectiveness of accounting numbers in communicating performance evaluation information. Of particular interest to me are performance reports which compare budgeted to actual results and provide variance information to the users. I would like to stress, however, that this study will not require access to any of your accounting information. I am not interested in looking at the numbers but rather at the process.

I would be pleased to meet with you to discuss this study in more detail. Since every organization is different I feel it would be very beneficial if we could get together for an initial meeting so that you might familiarize me with your company, in general. Additionally, I have enclosed a copy of a questionnaire which I am considering using, and a tentative schedule of the study process. I would like to take this opportunity to assure you that if your company participates in this study the written results will fully generalize findings and mask the identities of individuals and the company for everyone's protection.

At the conclusion of the study I would be happy to prepare a report of the pertinent findings for you and any others you designate. I look forward to speaking with you in the near future regarding your company's participation in this study. Thank you for your time and consideration.

Sincerely,

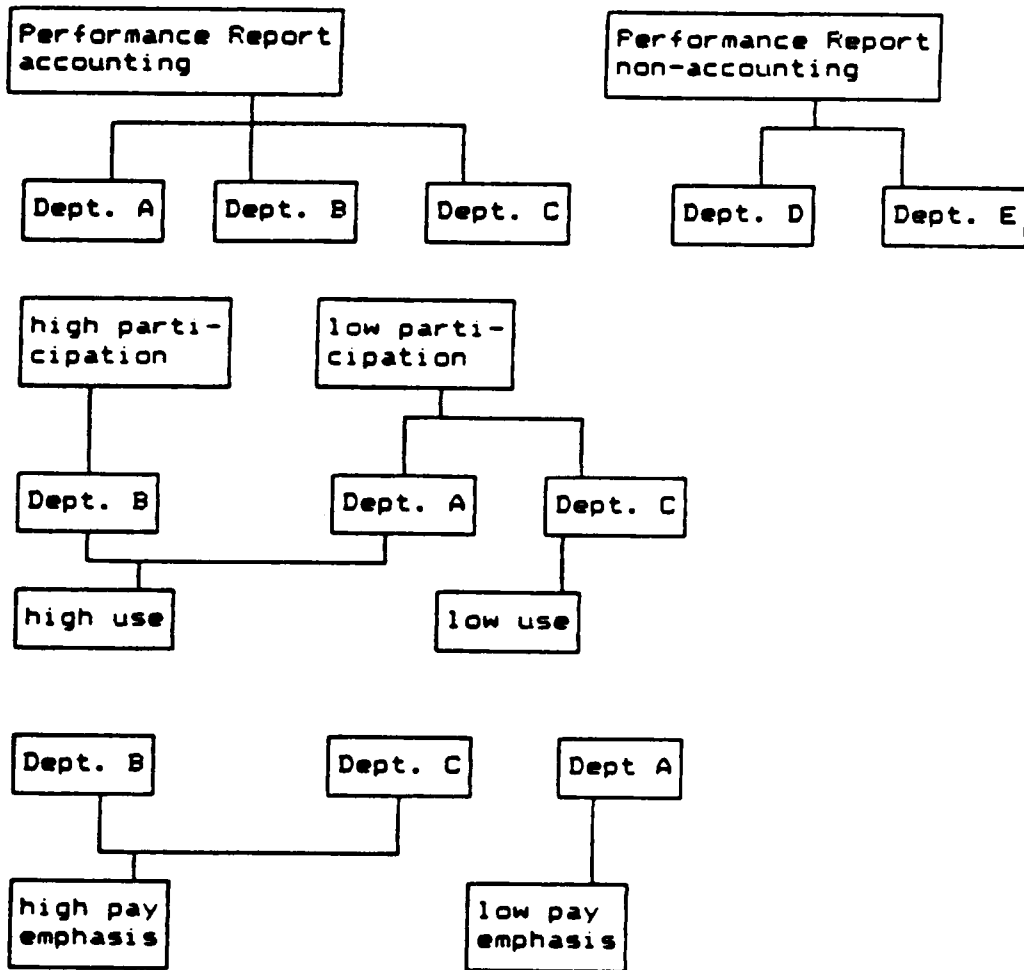
Leslie W. Weisenfeld

Tentative Study Schedule

1. Meet with _____ - discuss
 - a. general organizational climate
 - b. study approach and convenient times to visit
 - c. use of company documents such as organizational charts and job manuals etc.
 - d. who will participate in the study either through interviews and/or questionnaires
 - e. the performance evaluation process
 1. the extent to which accounting numbers are used
 2. the extent to which pay is tied to performance as determined by the accounting numbers
 3. the extent to which managers participate in the process
2. Preparation of organizational performance evaluation report (which uses accounting data) flowchart and performance report climate chart* based on
 - a. use of company documents agreed upon in step 1
 - b. interviews with individuals determined in step 1
3. Administration of questionnaire to individuals as determined in step 1 and 2 (estimated time 1 hour)
4. Data analysis
5. Discussion of results and written report

*hypothetical performance report climate chart attached

Hypothetical Performance Report Climate Chart



For the following statements indicate how much you agree or disagree with each statement using the following scale

1 = Strongly Agree (SA)

6 = Disagree (D)

2 = Agree (A)

7 = Strongly Disagree (SD)

4 = Neither Agree or Disagree (N)

	1	2	3	4	5	6	7
1. Praise is given for doing a good job	SA	A		N		D	SD
2. I can speak frankly with my supervisor	SA	A		N		D	SD
3. I can count on my supervisor to back me up	SA	A		N		D	SD
4. My supervisor stresses variances from the allowed standard when evaluating my performance	SA	A		N		D	SD
5. On my job, most of my tasks are clearly defined	SA	A		N		D	SD
6. I understand what my supervisor expects of me	SA	A		N		D	SD
7. Just doing my job gives me many chances to figure out how well I am doing	SA	A		N		D	SD
8. There are goals set for my job	SA	A		N		D	SD
9. I understand the goals set for my job	SA	A		N		D	SD
10. The goals set for my job are fair	SA	A		N		D	SD
11. The arrangement of people and equipment is right for my job	SA	A		N		D	SD
12. My supervisor is flexible when necessary	SA	A		N		D	SD
13. My supervisor's evaluation of my performance is very general and personal	SA	A		N		D	SD
14. I usually know whether or not my work is satisfactory on this job	SA	A		N		D	SD
15. My supervisor asks for advice when making decisions that concern me	SA	A		N		D	SD
16. I have a chance to take part in							

	deciding what the work methods, procedures and goals will be on my job	SA A	N	D	SD
17.	My supervisor emphasizes the quality of my production	SA A	N	D	SD
18.	I emphasize the variances from the allowed standard when I evaluate the performance of my subordinates	SA A	N	D	SD
19.	On my job there are always deadlines and tight schedules	SA A	N	D	SD
20.	The company sets high performance goals	SA A	N	D	SD
21.	I feel alot of pressure to produce	SA A	N	D	SD
22.	Considering my skills and the effort I put into my work I am very satisfied with my annual compensation	SA A	N	D	SD
23.	I have the type and amount of equipment and supplies I need for my job	SA A	N	D	SD
24.	Knowing the variances from the allowed standard helps me figure out where I need to improve performance	SA A	N	D	SD
25.	Knowing the variances from the allowed standard helps me improve my performance	SA A	N	D	SD
26.	Variance from the allowed standard is a good way to measure my performance	SA A	N	D	SD
27.	If I improve on the variances allowed from the standard my year end bonus will increase	SA A	N	D	SD
28.	I can use the variances allowed from the standard to improve my performance and increase my year end bonus	SA A	N	D	SD
29.	I try hard to get ahead on my job	SA A	N	D	SD
30.	I am concerned about the quality of my work.	SA A	N	D	SD
31.	I am interested and deeply involved in my work	SA A	N	D	SD
32.	My supervisor emphasizes the quantity of my production	SA A	N	D	SD

33. The variances from the allowed standard used for my job are fair SA A N D SD
34. My salary and bonus depends on how well I perform SA A N D SD
35. The amount of my year end bonus is determined by the variances from the allowed standard SA A N D SD
36. I am concerned about the quantity that I produce SA A N D SD
37. I am concerned about the variances from the allowed standard SA A N D SD

For the following questions indicate how important the item is to you using the following scale.

- 1 = Unimportant (U)
 4 = Important (I)
 7 = Very Important (VI)

- | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|----|
| 38. The fringe benefits you receive | U | | | I | | | VI |
| 39. The variances from the allowed standard | U | | | I | | | VI |
| 40. The amount of salary and bonus you get | U | | | I | | | VI |
| 41. The amount of job security you have | U | | | I | | | VI |

For the following questions indicate how satisfied you are with the item using the following scale

- 1 = Very Dissatisfied (V) 6 = Satisfied (S)
 2 = Dissatisfied (DS) 7 = Very Satisfied (VS)
 4 = Neither Dissatisfied or Satisfied (N)

- | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|----|---|---|---|---|----|
| 42. The fringe benefits you receive | V | DS | | N | | S | VS |
| 43. The use of variances from the allowed standard | V | DS | | N | | S | VS |

55. What is your education level (indicate highest completed)

- 1 = grade school
- 2 = some high school (grades 9-11)
- 3 = graduated from high school
- 4 = some college or technical training beyond high school

56. How old are you?

- 1 = 18-25
- 2 = 26-35
- 3 = 36-45
- 4 = 46-55
- 5 = 56-65
- 6 = over 65

57. How long have you worked for this company?

- 1 = less than 1 year
- 2 = less than 2 years
- 3 = 2-4 years
- 4 = 5-8 years
- 5 = 9-15 years
- 6 = 16-20 years
- 7 = more than 20 years

58. How long have you worked in your present job (position) with this company

- 1 = less than 1 year
- 2 = less than 2 years
- 3 = 2-4 years
- 4 = 5-8 years
- 5 = 9-15 years
- 6 = 16-20 years
- 7 = more than 20 years

59. The department(s) you supervise

- 1 = Maintenance
- 2 = Rough Machine
- 3 = Glue Room
- 4 = Finish Machine A
- 5 = Finish Machine B
- 6 = Sand Room
- 7 = Preassembly Area
- 8 = Parts Inspection
- 9 = Cabinet Room
- 10 = Finishing Room
- 11 = Rub and Pack
- 12 = Warehouse
- 13 = Service Department
- 14 = Quality Control
- 15 = Scheduling Department
- 16 = Product Engineering
- 17 = Personnel Department
- 18 = Production Control Department
- 19 = Other (specify) _____

60. Your job title is

- 1 = V.P. of Manufacturing
- 2 = Plant Manager
- 3 = Division Manager
- 4 = Departmental Manager
- 5 = Group Leader
- 6 = Utility Person
- 7 = Other (specify) _____

61. How would you rank your performance as compared to your co-workers

- 1. lower than others
- 2.
- 3. average
- 4.
- 5. higher than others

62. Rank the performance of the department(s) you supervise- use the scale in question 61

- 1 = Maintenance
- 2 = Rough Machine
- 3 = Glue Room
- 4 = Finish Machine A
- 5 = Finish Machine B
- 6 = Sand Room
- 7 = Preassembly Area
- 8 = Parts Inspection
- 9 = Cabinet Room
- 10 = Finishing Room
- 11 = Rub and Pack
- 12 = Warehouse
- 13 = Service Department
- 14 = Quality Control
- 15 = Scheduling Department
- 16 = Product Engineering
- 17 = Personnel Department
- 18 = Production Control Department
- 19 = Other (specify) _____

APPENDIX C- COMPANY NARRATIVES

Company A

The management structure of the plant involves the V.P. of manufacturing, the plant manager, superintendent, departmental supervisor, and assistant supervisor. The V.P. of manufacturing and plant manager receive a production report on a daily and weekly basis. The plant manager has a weekly production quota which is transmitted to the plant management team and the middle and lower levels of plant management have monthly bonuses tied to their control of the variances.

The V.P. of manufacturing indicated that variances are used to compute bonuses and he believes they are an appropriate way to measure and reward performance.

Company B

The management structure of the plant involves the V.P. of manufacturing, the plant manager, division manager, and departmental manager. The V.P. of manufacturing and plant manager receive daily and weekly operating reports which indicate the expected daily production. The plant manager transmits the information to middle and lower levels of plant management for their respective departments. Middle and lower levels of plant management receive monthly and end of the year bonuses based on their ability to control the variances.

The V.P. of manufacturing indicated that variances are used to compute bonuses and he believes they are an appropriate way to measure and reward performance.

APPENDIX D- PRE-QUESTIONNAIRE MODULES

Demographics

1. Are you - 1. male 2. female
2. What is your education level (indicate highest completed)
 1. grade school
 2. some high school (grades 9-11)
 3. graduated from high school or G.E.D.
 4. some college or technical training beyond high school (1-3 years)
 5. graduated from college (B.A., B.S., or other Bachelor's degree)
 6. some graduate school
 7. graduate degree
3. How old are you?
 1. 18-25
 2. 26-35
 3. 36-45
 4. 46-55
 5. 56-65
 6. over 65
4. How long have you worked for this company?
 1. less than 1 year
 2. less than 2 years
 3. 2-4 years
 4. 5-8 years
 5. 9-15 years
 6. 16-20 years
 7. more than 20 years
5. How long have you worked in your present job (position) with this company
 1. less than 1 year
 2. less than 2 years
 3. 2-4 years
 4. 5-8 years
 5. 9-15 years
 6. 16-20 years
 7. more than 20 years
6. The department(s) you supervise +
 1. names of departments
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.

7. Your job title is +
1. v.p. manufacturing
 2. plant manager
 3. division manager
 4. departmental manager
 5. foreman
 - 6.

*adapted from the MQAQ
+added questions

Supervisory Style

For the following statements indicate how much you agree or disagree with each statement using the following scale

1. strongly disagree
2. disagree
3. slightly disagree
4. neither agree or disagree
5. slightly agree
6. agree
7. strongly agree

1. Praise is given for doing a good job
2. Employees are able to speak frankly with the supervisor
3. Individuals can count on their supervisor to back them up
4. Employees know what their supervisor expects of them
5. The supervisor is flexible when necessary
6. Your supervisor's evaluation of your performance is very general and subjective +
7. Your supervisor emphasizes the performance report in evaluating your performance +
8. I emphasize the performance report when I evaluate my subordinates' performance +

factor loadings .55 > alpha = .88

Decision Making Policy

8. Managers and supervisors ask for the advice of their employees when making decisions that affect the employees
9. There is an opportunity to take part in deciding what the work methods, procedures and goals will be

factor loadings .58 > alpha = .72

Pressure to Produce

10. The supervisor emphasizes production quality +
11. The supervisor emphasizes production quantity; +
12. Employees compete with each other
13. There is almost a continuous series of deadlines and tight schedules
14. There are high performance standards
15. There is strong pressure to produce

factor loadings .44 > alpha= .55

*adapted from the PWE
+questions added

Job Facets

For the following questions indicate how important the item is to you using the following scale.

3. moderately important or less
- 4.
- 5.
6. quite important
- 7.
- 8.
9. extremely important

1. the fringe benefits you receive
2. the amount of pay you get
3. the amount of job security you have
4. your performance report +

For the following questions indicate how satisfied you are with the item using the following scale

1. very dissatisfied
2. dissatisfied
3. slightly dissatisfied
4. neither dissatisfied or satisfied
5. slightly satisfied
6. satisfied
7. very satisfied

5. the fringe benefits you receive
6. the amount of pay you get
7. the amount of job security you have
8. your performance report +

For the following questions indicate how likely it is that these items would occur if you performed your job especially well using the following scale

1. not at all likely
- 2.
3. somewhat likely
- 4.
5. quite likely
- 6.
7. extremely likely

9. you will get a bonus or pay increase
10. you will be given chances to learn new things
11. you will get promoted or get a better job

internal consistency reliability estimates .51

*adapted from the MOAQ
+added questions

Task and Role Characteristics

For the following questions indicate how much you agree or disagree with the item as a description of your job using the following scale

1. strongly disagree
2. disagree
3. slightly disagree
4. neither agree or disagree
5. slightly agree
6. agree
7. strongly agree

1. your performance report helps you figure out where you need to improve performance +
2. just doing my job gives me many chances to figure out how well I am doing
3. on my job, most of my tasks are clearly defined
4. there are standards for my job +
5. I know the standards for my job +
6. I usually know whether or not my work is satisfactory on this job
7. On my job, I know exactly what is expected of me
8. the standards set for my job are fair +
9. your job performance is accurately reflected in your performance +
10. your performance report is fair +
11. you can use the performance report to improve your performance +
12. the performance report is an appropriate way to measure your performance +
13. if your performance report improves your pay will increase +

14. you can use your performance report to improve performance and increase your pay +

Internal consistency reliability estimates .41 >

*adapted from the MOAQ
+ added questions

Equipment/People-Equipment Arrangement

15. the arrangement of people and equipment is appropriate for my job
16. the arrangement of employees allows for efficient and effective performance of my job
17. the proper type and amount of equipment and supplies are available for my job

factor loadings .57 > alpha = .71

*adapted from the FWE

Employee Motivation

18. I try hard to get ahead
19. I have concern for the quality of my work.
20. I am interested and deeply involved in my work
21. I have concern for the quantity of what I produce +
22. I am concerned about my performance report +

factor loadings .56 > alpha = .74

*adapted from the PWE
+ added questions

Pay

For the following items indicate how important they are for determining pay with your company using the following scale

1. very unimportant
- 2.
- 3.
4. important
- 5.
- 6.
7. very important

1. your education, training and experience
2. the quality of your job performance
3. your productivity
4. the quality of your work group's performance

- 5. the productivity of your work group
- 6. your performance report +

For the following statements indicate how much you agree or disagree with the items as they relate to your job using the following scale

- 1. strongly disagree
- 2. disagree
- 3. slightly disagree
- 4. neither agree or disagree
- 5. slightly agree
- 6. agree
- 7. strongly agree

- 7. I don't make the kind of money I should for the job I do
- 8. considering my skills and the effort I put into my work I am very satisfied with my pay.
- 9. My pay is fair given what my co-workers make
- 10. Pay raises around here depend on how well you perform
- 11. my pay is based on my performance report +

internal consistency reliability estimates .47 >

*adapted from MOAQ
+added questions

Performance

- 1. How would you rank your performance as compared to your coworkers
 - 1. lower than others
 - 2.
 - 3. average
 - 4.
 - 5. higher than others
- 2. Rank the performance of the departments you supervise- use the scale in question 1
 - 1. names of departments
 - 2.
 - 3.
 - 4.
 - 5.

The performance questions were made up specifically for this research

APPENDIX E- QUESTIONNAIRES, COMPANY A AND B

For the following statements indicate how much you agree or disagree with each statement using the following scale

- 1 = Strongly Agree (SA) 6 = Disagree (D)
 2 = Agree (A) 7 = Strongly Disagree (SD)
 4 = Neither Agree or Disagree (N)

	1	2	3	4	5	6	7
1. Praise is given for doing a good job	SA	A		N		D	SD
2. I can speak frankly with my supervisor	SA	A		N		D	SD
3. I can count on my supervisor to back me up	SA	A		N		D	SD
4. My supervisor stresses the monthly production schedule when evaluating my performance	SA	A		N		D	SD
5. On my job, most of my tasks are clearly defined	SA	A		N		D	SD
6. I understand what my supervisor expects of me	SA	A		N		D	SD
7. Just doing my job gives me many chances to figure out how well I am doing	SA	A		N		D	SD
8. There are goals set for my job	SA	A		N		D	SD
9. I understand the goals set for my job	SA	A		N		D	SD
10. The goals set for my job are fair	SA	A		N		D	SD
11. The arrangement of people and equipment is right for my job	SA	A		N		D	SD
12. My supervisor is flexible when necessary	SA	A		N		D	SD
13. My supervisor's evaluation of my performance is very general and personal	SA	A		N		D	SD
14. I usually know whether or not my work is satisfactory on this job	SA	A		N		D	SD
15. My supervisor asks for advice when making decisions that concern me	SA	A		N		D	SD
16. I have a chance to take part in deciding what the work methods, procedures and goals will be on my job	SA	A		N		D	SD

17. My supervisor emphasizes the quality of my production	SA A	N	D	SD
18. I emphasize the monthly production schedule when I evaluate the performance of my subordinates	SA A	N	D	SD
19. On my job there are always deadlines and tight schedules	SA A	N	D	SD
20. The company sets high performance goals	SA A	N	D	SD
21. I feel alot of pressure to produce	SA A	N	D	SD
22. Considering my skills and the effort I put into my work I am very satisfied with my salary and bonus	SA A	N	D	SD
23. I have the type and amount of equipment and supplies I need for my job	SA A	N	D	SD
24. The monthly production schedule helps me figure out where I need to improve performance	SA A	N	D	SD
25. I can use the monthly production schedule to improve my performance	SA A	N	D	SD
26. The the monthly production schedule is a good way to measure my performance	SA A	N	D	SD
27. If I do better on my monthly production schedule my salary and bonus will increase	SA A	N	D	SD
28. I can use the monthly production schedule to improve my performance and increase my salary and bonus	SA A	N	D	SD
29. I try hard to get ahead on my job	SA A	N	D	SD
30. I am concerned about the quality of my work.	SA A	N	D	SD
31. I am interested and deeply involved in my work	SA A	N	D	SD
32. My supervisor emphasizes the quantity of my production	SA A	N	D	SD
33. The monthly production schedule used for my job is fair	SA A	N	D	SD

34. My salary and bonus depends on how well I perform	SA	A	N	D	SD
35. The amount of my salary and bonus is determined by the monthly production schedule	SA	A	N	D	SD
36. I am concerned about the quantity that I produce	SA	A	N	D	SD
37. I am concerned about the monthly production schedule	SA	A	N	D	SD

For the following questions indicate how important the item is to you using the following scale.

- 1 = Unimportant (U)
- 4 = Important (I)
- 7 = Very Important (VI)

	1	2	3	4	5	6	7
38. The fringe benefits you receive	U			I			VI
39. The monthly production schedule	U			I			VI
40. The amount of salary and bonus you get	U			I			VI
41. The amount of job security you have	U			I			VI

For the following questions indicate how satisfied you are with the item using the following scale

- 1 = Very Dissatisfied (U)
- 2 = Dissatisfied (DS)
- 4 = Neither Dissatisfied or Satisfied (N)
- 6 = Satisfied (S)
- 7 = Very Satisfied (US)

	1	2	3	4	5	6	7
42. The fringe benefits you receive	U	DS		N		S	US
43. The use of the monthly production schedule	U	DS		N		S	US
44. The amount of salary and bonus you get	U	DS		N		S	US
45. The amount of job security you have	U	DS		N		S	US

For the following questions indicate how likely it is that these items would occur if you performed your job especially well using the following scale

- 1 = Not At All Likely (NL)
- 4 = Likely (L)
- 7 = Extremely Likely

	1	2	3	4	5	6	7
46. You will get a year end bonus	NL			L			EL
47. You will be given chances to learn new things	NL			L			EL

For the following items indicate how important they are for determining salary and bonus with your company using the following scale

- 1 = Unimportant (U)
- 4 = Important (I)
- 7 = Very Important (UI)

	1	2	3	4	5	6	7
48. Your training and experience	U			I			UI
49. The quality of your job performance	U			I			UI
50. The quantity of your performance	U			I			UI
51. The quality of your work group's performance	U			I			UI
52. The quantity of your work group's performance	U			I			UI
53. The monthly production schedule	U			I			UI
54. Are you? 1 = male 2 = female							
55. What is your education level(indicate highest completed)							

- 1 = grade school
- 2 = some high school (grades 9-11)
- 3 = graduated from high school
- 4 = some college or technical training beyond high school

56. How old are you?

- | | |
|-----------|-------------|
| 1 - 18-25 | 4 - 46-55 |
| 2 - 26-35 | 5 - 56-65 |
| 3 - 36-45 | 6 - over 65 |

57. How long have you worked for this company?

- | | |
|-----------------------|------------------------|
| 1 - less than 1 year | 5 - 9-15 years |
| 2 - less than 2 years | 6 - 16-20 years |
| 3 - 2-4 years | 7 - more than 20 years |
| 4 - 5-8 years | |

58. How long have you worked in your present job (position) with this company

- | | |
|-----------------------|------------------------|
| 1 - less than 1 year | 5 - 9-15 years |
| 2 - less than 2 years | 6 - 16-20 years |
| 3 - 2-4 years | 7 - more than 20 years |
| 4 - 5-8 years | |

59. The department(s) you supervise

- 1 - Lumber Yard
- 2 - Rough End
- 3 - Vaneer Room
- 4 - Finish Machine Room
- 5 - Sanding
- 6 - Cabinet
- 7 - Finishing
- 8 - Packing Room
- 9 - Shipping Room
- 10 - Other (specify) _____

60. Your job title is

- 1 - U.P. of Manufacturing
- 2 - Plant Manager
- 3 - Superintendent
- 4 - Departmental Supervisor
- 5 - Assistant supervisor
- 6 - Other (specify) _____

61. How would you rank your performance as compared to your co-workers

1. lower than others
- 2.
3. average
- 4.
5. higher than others

62. Rank the performance of the department(s) you supervise- use the scale in question 61

- 1 - Lumber Yard
- 2 - Rough End
- 3 - Veneer Room
- 4 - Finish Machine Room
- 5 - Sanding
- 6 - Cabinet
- 7 - Finishing
- 8 - Packing Room
- 9 - Shipping Room
- 10 - Other (specify) _____

COMPANY B

For the following statements indicate how much you agree or disagree with each statement using the following scale

- 1 = Strongly Agree (SA) 6 = Disagree (D)
 2 = Agree (A) 7 = Strongly Disagree (SD)
 4 = Neither Agree or Disagree (N)

	1	2	3	4	5	6	7
1. Praise is given for doing a good job	SA	A		N		D	SD
2. I can speak frankly with my supervisor	SA	A		N		D	SD
3. I can count on my supervisor to back me up	SA	A		N		D	SD
4. My supervisor stresses variances from the allowed standard when evaluating my performance	SA	A		N		D	SD
5. On my job, most of my tasks are clearly defined	SA	A		N		D	SD
6. I understand what my supervisor expects of me	SA	A		N		D	SD
7. Just doing my job gives me many chances to figure out how well I am doing	SA	A		N		D	SD
8. There are goals set for my job	SA	A		N		D	SD
9. I understand the goals set for my job	SA	A		N		D	SD
10. The goals set for my job are fair	SA	A		N		D	SD
11. The arrangement of people and equipment is right for my job	SA	A		N		D	SD
12. My supervisor is flexible when necessary	SA	A		N		D	SD
13. My supervisor's evaluation of my performance is very general and personal	SA	A		N		D	SD
14. I usually know whether or not my work is satisfactory on this job	SA	A		N		D	SD
15. My supervisor asks for advice when making decisions that concern me	SA	A		N		D	SD
16. I have a chance to take part in deciding what the work methods, procedures and goals will be on my job	SA	A		N		D	SD

17. My supervisor emphasizes the quality of my production	SA A	N	D	SD
18. I emphasize the variances from the allowed standard when I evaluate the performance of my subordinates	SA A	N	D	SD
19. On my job there are always deadlines and tight schedules	SA A	N	D	SD
20. The company sets high performance goals	SA A	N	D	SD
21. I feel alot of pressure to produce	SA A	N	D	SD
22. Considering my skills and the effort I put into my work I am very satisfied with my annual compensation	SA A	N	D	SD
23. I have the type and amount of equipment and supplies I need for my job	SA A	N	D	SD
24. Knowing the variances from the allowed standard helps me figure out where I need to improve performance	SA A	N	D	SD
25. Knowing the variances from the allowed standard helps me improve my performance	SA A	N	D	SD
26. Variance from the allowed standard is a good way to measure my performance	SA A	N	D	SD
27. If I improve on the variances allowed from the standard my year end bonus will increase	SA A	N	D	SD
28. I can use the variances allowed from the standard to improve my performance and increase my year end bonus	SA A	N	D	SD
29. I try hard to get ahead on my job	SA A	N	D	SD
30. I am concerned about the quality of my work.	SA A	N	D	SD
31. I am interested and deeply involved in my work	SA A	N	D	SD
32. My supervisor emphasizes the quantity of my production	SA A	N	D	SD
33. The variances from the allowed standard used for my job are fair	SA A	N	D	SD

34. My salary and bonus depends on how well I perform	SA A	N	D	SD
35. The amount of my year end bonus is determined by the variances from the allowed standard	SA A	N	D	SD
36. I am concerned about the quantity that I produce	SA A	N	D	SD
37. I am concerned about the variances from the allowed standard	SA A	N	D	SD

For the following questions indicate how important the item is to you using the following scale.

- 1 = Unimportant (U)
 4 = Important (I)
 7 = Very Important (UI)

	1	2	3	4	5	6	7
38. The fringe benefits you receive	U			I			UI
39. The variances from the allowed standard	U			I			UI
40. The amount of salary and bonus you get	U			I			UI
41. The amount of job security you have	U			I			UI

For the following questions indicate how satisfied you are with the item using the following scale

- 1 = Very Dissatisfied (U) 6 = Satisfied (S)
 2 = Dissatisfied (DS) 7 = Very Satisfied (US)
 4 = Neither Dissatisfied or Satisfied (N)

	1	2	3	4	5	6	7
42. The fringe benefits you receive	U	DS		N		S	US
43. The use of variances from the allowed standard	U	DS		N		S	US
44. The amount of salary and bonus you get	U	DS		N		S	US
45. The amount of job security you have	U	DS		N		S	US

For the following questions indicate how likely it is that these items would occur if you performed your job especially well using the following scale

- 1 - Not At All Likely (NL)
- 4 - Likely (L)
- 7 - Extremely Likely

	1	2	3	4	5	6	7
46. You will get a year end bonus	NL			L			EL
47. You will be given chances to learn new things	NL			L			EL

For the following items indicate how important they are for determining salary and bonus with your company using the following scale

- 1 - Unimportant (U)
- 4 - Important (I)
- 7 - Very Important (UI)

	1	2	3	4	5	6	7
48. Your training and experience	U			I			UI
49. The quality of your job performance	U			I			UI
50. The quantity of your performance	U			I			UI
51. The quality of your work group's performance	U			I			UI
52. The quantity of your work group's performance	U			I			UI
53. The variances from the allowed standard	U			I			UI
54. Are you? 1 - male 2 - female							
55. What is your education level(indicate highest completed)							

- 1 - grade school
- 2 - some high school (grades 9-11)
- 3 - graduated from high school
- 4 - some college or technical training beyond high school

56. How old are you?

- | | |
|-----------|-------------|
| 1 - 18-25 | 4 - 46-55 |
| 2 - 26-35 | 5 - 56-65 |
| 3 - 36-45 | 6 - over 65 |

57. How long have you worked for this company?

- | | |
|-----------------------|------------------------|
| 1 - less than 1 year | 5 - 9-15 years |
| 2 - less than 2 years | 6 - 16-20 years |
| 3 - 2-4 years | 7 - more than 20 years |
| 4 - 5-8 years | |

58. How long have you worked in your present job (position) with this company

- | | |
|-----------------------|------------------------|
| 1 - less than 1 year | 5 - 9-15 years |
| 2 - less than 2 years | 6 - 16-20 years |
| 3 - 2-4 years | 7 - more than 20 years |
| 4 - 5-8 years | |

59. The department(s) you supervise

- 1 - Maintenance
- 2 - Rough Machine
- 3 - Glue Room
- 4 - Finish Machine A
- 5 - Finish Machine B
- 6 - Sand Room
- 7 - Preassembly Area
- 8 - Parts Inspection
- 9 - Cabinet Room
- 10 - Finishing Room
- 11 - Rub and Pack
- 12 - Warehouse
- 13 - Service Department
- 14 - Quality Control
- 15 - Scheduling Department
- 16 - Product Engineering
- 17 - Personnel Department
- 18 - Production Control Department
- 19 - Other (specify) _____

60. Your job title is

- 1 - U.P. of Manufacturing
- 2 - Plant Manager
- 3 - Division Manager
- 4 - Departmental Manager
- 5 - Group Leader
- 6 - Utility Person
- 7 - Other (specify) _____

61. How would you rank your performance as compared to your co-workers

1. lower than others
- 2.
3. average
- 4.
5. higher than others

62. Rank the performance of the department(s) you supervise- use the scale in question 61

- 1 - Maintenance
- 2 - Rough Machine
- 3 - Glue Room
- 4 - Finish Machine A
- 5 - Finish Machine B
- 6 - Sand Room
- 7 - Preassembly Area
- 8 - Parts Inspection
- 9 - Cabinet Room
- 10 - Finishing Room
- 11 - Rub and Pack
- 12 - Warehouse
- 13 - Service Department
- 14 - Quality Control
- 15 - Scheduling Department
- 16 - Product Engineering
- 17 - Personnel Department
- 18 - Production Control Department
- 19 - Other (specify) _____

**APPENDIX F- COMPANY A, PLANT ONE
ANALYSIS OF HYPOTHESES**

H1: Perceptions of equitability of the performance report with respect to its perceived use (high or low) for performance evaluation purposes.

First the respondents were grouped on question 4 (all questions came from Appendix E), responses 1-3 formed the high use group and responses 5-7 formed the low use group. Individuals who responded to the question by answering N (neither) were eliminated from this part of the analysis. These groups were then analyzed with respect to questions 26 (Q26A) and 33 (Q33A) using the Chi-Square test of independence (Table 10). Due to the small number of respondents within three cells H0 regarding Q26A could not be accepted or rejected. Since no disagrees (inequitables) existed in the group of respondents with respect to Q33A no analysis could be performed.

H2: Perceptions of equitability with respect to positive and negative path perceptions

First the respondents were grouped according to their responses to questions 24 and 25, if the responses totaled 7 or less they were placed in the positive path group, 8 discarded for this part of the analysis, and 9 or more formed the negative path group. Next these groups' responses to questions 26 and 33 were analyzed using the

TABLE TEN- HYPOTHESIS ONE, COMPANY A PLANT ONE

TABLE OF GROUP BY Q26A

GROUP Q26A				
FREQUENCY PERCENT ROW PCT COL PCT	AGREE	DISAG	TOTAL	
	HIG	9 81.82 90.00 90.00		
LOW	1 9.09 100.00 10.00	0 0.00 0.00 0.00	1 9.09	
TOTAL	10 90.91	1 9.09	11 100.00	

STATISTICS FOR TABLE OF GROUP BY Q26A

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.110	0.740
LIKELIHOOD RATIO CHI-SQUARE	1	0.200	0.654
CONTINUITY ADJ. CHI-SQUARE	1	0.000	1.000
MANTEL-HAENSZEL CHI-SQUARE	1	0.100	0.752
FISHER'S EXACT TEST (1-TAIL)			0.909
(2-TAIL)			1.000
PHI		-0.100	
CONTINGENCY COEFFICIENT		0.100	
CRAMER'S V		-0.100	

SAMPLE SIZE = 11

WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF GROUP BY Q33A

GROUP Q33A				
FREQUENCY PERCENT ROW PCT COL PCT	AGREE		TOTAL	
	HIG	10 90.91 100.00 90.91		
LOW	1 9.09 100.00 9.09		1 9.09	
TOTAL	11 100.00		11 100.00	

Chi-Square test of independence (Table 11). Since none of the respondents perceived the performance report to be inequitable (disagree) no statistical analysis could be performed. Thus H_0 could not be accepted or rejected.

H3: Perceptions regarding task role characteristics by those who perceived a positive path and those who perceived a negative path.

The groupings formed for H2, positive and negative groups, were analyzed using the Wilcoxon rank sum test with respect to questions 5, 7, 8, 9, 10, 11, 14, and 23 (Table 12). No statistical analysis could be performed on questions 11 and 14 since the one respondent who indicated a negative path did not answer these questions. Employing .05 significance level H_0 could not be rejected except for question ten. It appears that the strength of the perceived fairness of the goals (standards) set for the job is affected by the perception of a positive or negative path. The nature of this difference is puzzling, however, since the individual who perceived a negative path indicated a higher perceived fairness overall than those who perceived a positive path. Theoretically the individual who perceives a negative path should also perceive the goals put forth by the performance report to be less fair.

TABLE ELEVEN- HYPOTHESIS TWO, COMPANY A PLANT ONE

TABLE OF GROUP BY Q26A

GROUP		Q26A	
FREQUENCY PERCENT ROW PCT COL PCT	AGREE	TOTAL	
		NEG	1 10.00 100.00 10.00
POS	9 90.00 100.00 90.00	9 90.00	
TOTAL	10 100.00	10 100.00	

TABLE OF GROUP BY Q33A

GROUP		Q33A	
FREQUENCY PERCENT ROW PCT COL PCT	AGREE	TOTAL	
		NEG	1 10.00 100.00 10.00
POS	9 90.00 100.00 90.00	9 90.00	
TOTAL	10 100.00	10 100.00	

TABLE TWELVE- HYPOTHESIS THREE, COMPANY A PLANT ONE

ANALYSIS FOR VARIABLE 05 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	6.00	7.00	3.06
POS	12	85.00	84.00	3.06

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² 8.00 Z=0.1656 PROB >|Z|=0.8701
T-TEST APPROX. SIGNIFICANCE=0.8720

ANALYSIS FOR VARIABLE 07 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	0.00	7.00	3.04
POS	12	85.00	84.00	3.04

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² 8.00 Z=0.1646 PROB >|Z|=0.8693
T-TEST APPROX. SIGNIFICANCE=0.8720

ANALYSIS FOR VARIABLE 08 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	3.50	7.00	3.24
POS	12	87.50	84.00	3.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² 3.50 Z=0.9250 PROB >|Z|=0.3543
T-TEST APPROX. SIGNIFICANCE=0.3720

ANALYSIS FOR VARIABLE 09 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	0.00	7.00	3.04
POS	12	85.00	84.00	3.04

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² 8.00 Z=0.1646 PROB >|Z|=0.8693
T-TEST APPROX. SIGNIFICANCE=0.8720

ANALYSIS FOR VARIABLE 010 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	1.50	6.50	2.24
POS	11	76.50	71.50	2.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² 1.50 Z=2.0125 PROB >|Z|=0.0442
T-TEST APPROX. SIGNIFICANCE=0.0693

ANALYSIS FOR VARIABLE 023 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	5.00	7.00	3.43
POS	12	86.00	84.00	3.43

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² 5.00 Z=0.4372 PROB >|Z|=0.6619
T-TEST APPROX. SIGNIFICANCE=0.6697

H4: Perceptions of supervisory style by those individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 1, 2, 3, 6, 12, 13, 15, 16, 17, 19, 20, 21, and 32 using the Wilcoxon rank sum test (Table 13). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

The p values for questions 15 (.0720) and 20 (.0914), however, do indicate that some relationship exists. With respect to question 15, it appears that the individual who perceived a negative path also perceives that his superior does not ask for his advice while those who perceived a positive path generally felt that their supervisor asked for their advice. Additionally, the individual who perceived a negative path also indicated that the company does not set high performance goals (Q 20) on the other hand the positive group generally indicated that the company did set high performance goals. Both of these responses would be expected theoretically since the individual who perceives a negative path is likely to also feel that he is not as involved in the decision making process which affects the goals or standards and in turn the performance report.

TABLE THIRTEEN- HYPOTHESIS FOUR, COMPANY A PLANT ONE

ANALYSIS FOR VARIABLE Q1 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	3.50	7.00
POS	12	87.50	84.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S = 3.50$ $Z = 0.9258$ $PROB > |Z| = 0.3549$
 T-TEST APPROX. SIGNIFICANCE = 0.3728

ANALYSIS FOR VARIABLE Q2 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	9.50	7.00
POS	12	81.50	84.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S = 9.50$ $Z = 0.5948$ $PROB > |Z| = 0.5520$
 T-TEST APPROX. SIGNIFICANCE = 0.5638

ANALYSIS FOR VARIABLE Q3 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	3.00	7.00
POS	12	88.00	84.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S = 3.00$ $Z = -1.8516$ $PROB > |Z| = 0.2938$
 T-TEST APPROX. SIGNIFICANCE = 0.3137

ANALYSIS FOR VARIABLE Q6 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	2.50	7.00
POS	12	88.50	84.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S = 2.50$ $Z = -1.2413$ $PROB > |Z| = 0.2149$
 T-TEST APPROX. SIGNIFICANCE = 0.2502

ANALYSIS FOR VARIABLE Q12 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	8.50	7.00
POS	12	82.50	84.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S = 8.50$ $Z = 0.3651$ $PROB > |Z| = 0.7190$
 T-TEST APPROX. SIGNIFICANCE = 0.7214

ANALYSIS FOR VARIABLE Q13 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	8.00	6.50
POS	11	78.00	71.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S = 8.00$ $Z = 0.3303$ $PROB > |Z| = 0.7412$
 T-TEST APPROX. SIGNIFICANCE = 0.7474

TABLE THIRTEEN- continued

ANALYSIS FOR VARIABLE 015 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	13.00	7.00	3.06
P05	12	78.00	84.00	3.06

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 13.00 Z= 1.7891 PROB >|Z|=0.0720
 T-TEST APPROX. SIGNIFICANCE=0.0972

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 3.85 DF= 1 PROB > CHISQ=0.0497

ANALYSIS FOR VARIABLE 017 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	3.50	7.00	3.34
P05	12	87.50	84.00	3.34

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 3.50 Z= 0.8921 PROB >|Z|=0.3725
 T-TEST APPROX. SIGNIFICANCE=0.3899

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.88 DF= 1 PROB > CHISQ=0.3980

ANALYSIS FOR VARIABLE 016 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
0	1	3.00	7.00	3.44
5	12	88.00	84.00	3.44

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 3.00 Z= 1.8169 PROB >|Z|=0.3692
 T-TEST APPROX. SIGNIFICANCE=0.3293

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.33 DF= 1 PROB > CHISQ=0.2492

ANALYSIS FOR VARIABLE 019 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
400	1	12.50	7.00	3.30
005	12	78.50	84.00	3.30

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 12.50 Z= 1.4794 PROB >|Z|=0.1500
 T-TEST APPROX. SIGNIFICANCE=0.1440

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 2.65 DF= 1 PROB > CHISQ=0.1037

TABLE THIRTEEN- continued

ANALYSIS FOR VARIABLE Q20 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	13.00	7.00	3.26	13.00
POS	12	78.00	84.00	3.26	6.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 13.00 Z= 1.6881 PROB >|Z|=0.0914

T-TEST APPROX. SIGNIFICANCE=0.1172

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 3.39 DF= 1 PROB > CHISQ=0.0655

ANALYSIS FOR VARIABLE Q21 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

EVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
EO	1	12.50	7.00	3.61	12.50
OS	12	78.50	84.00	3.61	6.54

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 12.50 Z= 1.3868 PROB >|Z|=0.1655

T-TEST APPROX. SIGNIFICANCE=0.1987

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 2.33 DF= 1 PROB > CHISQ=0.1272

ANALYSIS FOR VARIABLE Q32 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	3.00	7.00	3.51	3.00
POS	12	88.00	84.00	3.51	7.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 3.00 Z=-0.9977 PROB >|Z|=0.3184

T-TEST APPROX. SIGNIFICANCE=0.3381

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.30 DF= 1 PROB > CHISQ=0.2542

H5: Motivation of individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 29, 30, 31, 36, and 37 using the Wilcoxon rank sum test (Table 14). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

H6: Job facet perceptions of those who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 34, 35, and 38 - 52 using the Wilcoxon rank sum test (Table 15). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

H7: Perceived pay-performance linkage by those who perceive a positive path and those who perceive a negative path.

The positive and negative groups were compared with respect to questions 27 and 28 using the Wilcoxon rank sum test (Table 16). Employing .05 significance level H_0 could not be rejected with respect to either of the questions.

TABLE FOURTEEN- HYPOTHESIS FIVE, COMPANY A PLANT ONE

<p>ANALYSIS FOR VARIABLE Q29 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES</p>				<p>ANALYSIS FOR VARIABLE Q31 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES</p>					
<p>MILCOXON SCORES (RANK SUMS)</p>				<p>MILCOXON SCORES (RANK SUMS)</p>					
LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
EO	1	3.50	7.00	3.24	0	1	4.00	4.50	2.96
OS	12	87.50	84.00	3.24	15	11	74.00	71.50	2.96
<p>MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 3.50 Z=0.9258 PROB > Z =0.3545 T-TEST APPROX. SIGNIFICANCE=0.3728</p>				<p>MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 4.00 Z=0.6761 PROB > Z =0.4999 T-TEST APPROX. SIGNIFICANCE=0.5129</p>					
<p>KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI50= 1.17 DF= 1 PROB > CHI50=0.2881</p>				<p>ANALYSIS FOR VARIABLE Q34 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES</p>					
<p>ANALYSIS FOR VARIABLE Q30 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES</p>				<p>MILCOXON SCORES (RANK SUMS)</p>					
LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
EO	1	5.50	7.00	2.74	ME0	1	4.00	7.00	3.24
POS	12	85.50	84.00	2.74	POS	12	87.00	84.00	3.24
<p>MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 5.50 Z=0.3631 PROB > Z =0.7190 T-TEST APPROX. SIGNIFICANCE=0.7214</p>				<p>MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 4.00 Z=0.7715 PROB > Z =0.4404 T-TEST APPROX. SIGNIFICANCE=0.4553</p>					
<p>KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI50= 0.30 DF= 1 PROB > CHI50=0.5839</p>				<p>ANALYSIS FOR VARIABLE Q37 CLASSIFIED BY VARIABLE GROUP AVERAGE SCORES WERE USED FOR TIES</p>					
<p>MILCOXON SCORES (RANK SUMS)</p>				<p>MILCOXON SCORES (RANK SUMS)</p>					
LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
EO	1	8.50	7.00	3.22	EO	1	8.50	7.00	3.22
OS	12	82.50	84.00	3.22	OS	12	82.50	84.00	3.22
<p>MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 8.50 Z=0.3103 PROB > Z =0.7563 T-TEST APPROX. SIGNIFICANCE=0.7616</p>				<p>MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 8.50 Z=0.3103 PROB > Z =0.7563 T-TEST APPROX. SIGNIFICANCE=0.7616</p>					

TABLE FIFTEEN- HYPOTHESIS SIX, COMPANY A PLANT ONE

ANALYSIS FOR VARIABLE 034 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 039 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXOM SCORES (RANK SUMS)				MILCOXOM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	6.50	3.25	EO	1	9.00	7.00
POS	12	84.50	3.25	OS	12	87.00	84.00
MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 6.50 Z= 0.0000 PROB > Z =1.0000				MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 4.00 Z= 0.7715 PROB > Z =0.4406			
T-TEST APPROX. SIGNIFICANCE=1.0000				T-TEST APPROX. SIGNIFICANCE=0.4553			
ANALYSIS FOR VARIABLE 035 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXOM SCORES (RANK SUMS)				MILCOXOM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	10.50	3.43	MEQ	1	10.50	7.00
POS	12	80.50	3.43	POS	12	80.50	84.00
MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 10.50 Z= 0.8750 PROB > Z =0.3811				MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 10.50 Z= 0.8716 PROB > Z =0.3836			
T-TEST APPROX. SIGNIFICANCE=0.3983				T-TEST APPROX. SIGNIFICANCE=0.4003			
ANALYSIS FOR VARIABLE 036 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 041 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXOM SCORES (RANK SUMS)				MILCOXOM SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	10.50	3.43	MEQ	1	8.00	7.00
POS	12	80.50	3.43	POS	12	83.00	84.00
MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 10.50 Z= 0.8702 PROB > Z =0.3842				MILCOXOM 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 0.00 Z= 0.2132 PROB > Z =0.0312			
T-TEST APPROX. SIGNIFICANCE=0.4013				T-TEST APPROX. SIGNIFICANCE=0.0347			

TABLE FIFTEEN- continued

ANALYSIS FOR VARIABLE 042 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 045 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
MEQ	1	9.00	3.43	MEQ	1	12.00	7.00
POS	12	82.00	3.43	POS	12	79.00	64.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² 9.00 Z= 0.4372 PROB > Z =0.6619 T-TEST APPROX. SIGNIFICANCE=0.6697				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² 12.00 Z= 1.2748 PROB > Z =0.2024 T-TEST APPROX. SIGNIFICANCE=0.2265			
ANALYSIS FOR VARIABLE 043 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 046 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
MEQ	1	6.50	3.26	MEQ	1	5.00	7.00
POS	12	84.50	3.26	POS	12	86.00	64.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² 6.50 Z= 0.0000 PROB > Z =1.0000 T-TEST APPROX. SIGNIFICANCE=1.0000				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² 5.00 Z= -0.4307 PROB > Z =0.6522 T-TEST APPROX. SIGNIFICANCE=0.6602			
ANALYSIS FOR VARIABLE 044 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 047 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
MEQ	1	12.00	3.59	MEQ	1	5.50	7.00
POS	12	79.00	3.59	POS	12	85.50	64.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² 12.00 Z= 1.2518 PROB > Z =0.2104 T-TEST APPROX. SIGNIFICANCE=0.2345				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² 5.50 Z= -0.2859 PROB > Z =0.7749 T-TEST APPROX. SIGNIFICANCE=0.7798			

TABLE FIFTEEN- continued

ANALYSIS FOR VARIABLE Q48 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
ME0	1	9.50	7.00	3.22
POS	12	81.50	84.00	3.22

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 9.50 Z= 0.6266 PROB >|Z|=0.5348
 T-TEST APPROX. SIGNIFICANCE=0.5464

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.66 DF= 1 PROB > CHI30=0.4379

ANALYSIS FOR VARIABLE Q49 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
ME0	1	8.50	7.00	2.74
POS	12	82.50	84.00	2.74

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 8.50 Z= 0.5624 PROB >|Z|=0.7171
 T-TEST APPROX. SIGNIFICANCE=0.7234

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.30 DF= 1 PROB > CHI30=0.5867

ANALYSIS FOR VARIABLE Q50 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
ME0	1	9.00	7.00	3.04
POS	12	82.00	84.00	3.04

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 9.00 Z= 0.4937 PROB >|Z|=0.6215
 T-TEST APPROX. SIGNIFICANCE=0.4304

ANALYSIS FOR VARIABLE Q51 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
ME0	1	8.50	7.00	2.74
POS	12	82.50	84.00	2.74

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 8.50 Z= 0.5624 PROB >|Z|=0.7171
 T-TEST APPROX. SIGNIFICANCE=0.7234

ANALYSIS FOR VARIABLE Q52 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
ME0	1	8.50	7.00	2.74
POS	12	82.50	84.00	2.74

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 8.50 Z= 0.5624 PROB >|Z|=0.7171
 T-TEST APPROX. SIGNIFICANCE=0.7234

TABLE SIXTEEN- HYPOTHESIS SEVEN, COMPANY A PLANT ONE

ANALYSIS FOR VARIABLE Q26 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	2.50	7.00	3.56	2.50
POS	12	88.50	84.00	3.56	7.38

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 2.50 Z=-1.1228 PROB >|Z|=0.2615

T-TEST APPROX. SIGNIFICANCE=0.2835

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.60 DF= 1 PROB > CHISQ=0.2065

ANALYSIS FOR VARIABLE Q27 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	7.00	7.00	3.06	7.00
POS	12	84.00	84.00	3.06	7.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 7.00 Z= 0.1636 PROB >|Z|=0.8781

T-TEST APPROX. SIGNIFICANCE=0.8728

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.00 DF= 1 PROB > CHISQ=1.0000

H8: Perceived performance (self-reported) of managers who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to question 61 using the Wilcoxon rank sum test (Table 17). Employing .05 significance level H_0 could not be rejected.

H9: The perceived performance of those managers who reported a strong pay-performance linkage and those who reported a weak pay-performance linkage.

First the respondents were grouped according to their pay-performance linkage based on questions 27 and 28. Those individuals whose responses totaled 7 or less were classified as the strong pay-performance group (SPP), those whose responses totaled 8 were dropped from this analysis, and those whose responses totaled 9 or more were classified as the weak pay-performance group (WPP). Next these groups were compared with respect to questions 61 and 62 using the Wilcoxon rank sum test (Table 18). Employing .05 significance level H_0 could not be rejected with respect to either question.

Additionally, questions 1-53 were analyzed with a RCB design with managerial levels being treatments and blocking

TABLE SEVENTEEN- HYPOTHESIS EIGHT, COMPANY A PLANT ONE

ANALYSIS FOR VARIABLE Q61 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	2.00	7.00	3.51	2.00
POS	12	89.00	84.00	3.51	7.42

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 2.00 Z=-1.2827 PROB >|Z|=0.1996

T-TEST APPROX. SIGNIFICANCE=0.2238

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 2.03 DF= 1 PROB > CHISQ=0.1541

TABLE EIGHTEEN- HYPOTHESIS NINE, COMPANY A PLANT ONE

ANALYSIS FOR VARIABLE Q61 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	13	95.00	104.00	5.54	7.31
MPP	2	25.00	16.00	5.54	12.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 25.00 Z= 1.5355 PROB >|Z|=0.1247

T-TEST APPROX. SIGNIFICANCE=0.1469

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 2.64 DF= 1 PROB > CHISQ=0.1040

ANALYSIS FOR VARIABLE Q6200 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	13	101.00	104.00	5.66	7.77
MPP	2	19.00	16.00	5.66	9.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 19.00 Z= 0.4419 PROB >|Z|=0.6586

T-TEST APPROX. SIGNIFICANCE=0.6653

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.28 DF= 1 PROB > CHISQ=0.5959

on departments, next the results were analyzed using Duncan's Multiple Range Test to determine the agreement with respect to the questions (Table 19). As indicated there is a significant difference across all managerial levels, although there is considerable agreement within ranks with the plant manager differing most from the departmental managers.

Question 62, performance rankings, was analyzed with a RCB design using managerial levels as treatments and blocking on departments. The results indicated there was no significant difference in rankings assigned departments across managerial levels. The responses for all individuals to all questions is presented in Table 20.

TABLE NINETEEN- QUESTIONNAIRE RESPONSE COMPARISON, COMPANY A PLANT ONE

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE, RESP	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	B-SQUARE	C.V.	
SOURCE								
MODEL	60	2321.13191489	38.68533191	22.84	0.0001	0.680327	30.2277	
ERROR	644	1090.65531919	1.69356416				RESP MEAN	
CORRECTED TOTAL	704	3411.78723404					3.00425532	
SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
BLOCK	46	2261.38723404	29.83	0.0001	46	2261.38723404	29.83	0.0001
TREAT	14	59.74468885	2.32	0.0016	14	59.74468885	2.32	0.0016

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE, RESP
 NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE.
 NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=644 MSE=1.69356

NUMBER OF MEANS	CRITICAL RANGE	NUMBER OF MEANS	CRITICAL RANGE
2	0.533291	3	0.548789
3	0.560789	4	0.578482
4	0.591774	5	0.602961
5	0.612104	6	0.619345
6	0.625762	7	0.630983
7	0.63892	8	0.635272
8	0.642176	9	0.642176
9	0.644946	10	0.644946
10		11	0.647567
11		12	
12		13	
13		14	
14		15	

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TREAT
A	3.9574	47	8
A	3.8085	47	14
A	3.6809	47	5
A	3.6343	47	1
A	3.5532	47	10
A	3.5532	47	7
A	3.5319	47	3
A	3.3417	47	13
A	3.3191	47	9
A	3.2766	47	4
A	3.2120	47	15
A	3.1782	47	12
B	3.0426	47	2
B	2.9787	47	6
B	2.9787	47	11

**APPENDIX G- COMPANY A, PLANT TWO
ANALYSIS OF HYPOTHESES**

H1: Perceptions of equitability of the performance report with respect to its perceived use (high or low) for performance evaluation purposes.

First the respondents were grouped on question 4 (all questions came from Appendix E), responses 1-3 formed the high use group and responses 5-7 formed the low use group. Individuals who responded to the question by answering N (neither) were eliminated from this part of the analysis. These groups were then analyzed with respect to questions 26 (Q26A) and 33 (Q33A) using the Chi-Square test of independence (Table 21). Due to the small number of respondents within three cells HO regarding Q26A and Q33 could not be accepted or rejected.

H2: Perceptions of equitability with respect to positive and negative path perceptions

First the respondents were grouped according to their responses to questions 24 and 25, if the responses totaled 7 or less they were placed in the positive path group, 8 discarded for this part of the analysis, and 9 or more formed the negative path group. Next these groups' responses to questions 26 and 33 were analyzed using the Chi-Square test of independence (Table 22). Since none of the respondents perceived a negative path no statistical

TABLE TWENTY-ONE- HYPOTHESIS ONE, COMPANY A PLANT ONE

TABLE OF GROUP BY Q26A

GROUP Q26A				
FREQUENCY PERCENT ROW PCT COL PCT	AGREE	DISAG	TOTAL	
HIG	16	0	16	
	88.89	0.00	88.89	
	100.00	0.00		
	94.12	0.00		
LOW	1	1	2	
	5.56	5.56	11.11	
	50.00	50.00		
	5.88	100.00		
TOTAL	17	1	18	
	94.44	5.56	100.00	

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	8.471	0.004
LIKELIHOOD RATIO CHI-SQUARE	1	4.952	0.026
CONTINUITY ADJ. CHI-SQUARE	1	1.621	0.203
MANTEL-HAENSZEL CHI-SQUARE	1	8.000	0.005
FISHER'S EXACT TEST (1-TAIL)			0.111
(2-TAIL)			0.111
PHI		0.686	
CONTINGENCY COEFFICIENT		0.566	
CRAMER'S V		0.686	

SAMPLE SIZE = 18

WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF GROUP BY Q33A

GROUP Q33A				
FREQUENCY PERCENT ROW PCT COL PCT	AGREE	DISAG	TOTAL	
HIG	15	1	16	
	83.33	5.56	88.89	
	93.75	6.25		
	93.75	50.00		
LOW	1	1	2	
	5.56	5.56	11.11	
	50.00	50.00		
	6.25	50.00		
TOTAL	16	2	18	
	88.89	11.11	100.00	

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.445	0.063
LIKELIHOOD RATIO CHI-SQUARE	1	2.304	0.129
CONTINUITY ADJ. CHI-SQUARE	1	0.439	0.507
MANTEL-HAENSZEL CHI-SQUARE	1	3.254	0.071
FISHER'S EXACT TEST (1-TAIL)			0.216
(2-TAIL)			0.216
PHI		0.438	
CONTINGENCY COEFFICIENT		0.401	
CRAMER'S V		0.438	

SAMPLE SIZE = 18

WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE TWENTY-TWO- HYPOTHESIS TWO, COMPANY A PLANT ONE

TABLE OF GROUP BY Q26A

GROUP		Q26A		
POS	FREQUENCY	AGREE	DISAG	TOTAL
	PERCENT			
	ROW PCT			
COL PCT	AGREE	DISAG	TOTAL	
	20	1	21	
	95.24	4.76	100.00	
	95.24	4.76		
	100.00	100.00		
TOTAL	20	1	21	
	95.24	4.76	100.00	

TABLE OF GROUP BY Q33A

GROUP		Q33A		
POS	FREQUENCY	AGREE	DISAG	TOTAL
	PERCENT			
	ROW PCT			
COL PCT	AGREE	DISAG	TOTAL	
	20	1	21	
	95.24	4.76	100.00	
	95.24	4.76		
	100.00	100.00		
TOTAL	20	1	21	
	95.24	4.76	100.00	

analysis could be performed. Thus H_0 could not be accepted or rejected.

Since all these respondents had a positive path no further analysis could be done on this plant with respect to positive and negative groupings. Thus, the two plants from company A were pooled with the following results. H_1 and H_2 contained three cells with small numbers so H_0 could not be rejected or accepted (Tables 23 and 24).

H3: Perceptions regarding task role characteristics by those who perceived a positive path and those who perceived a negative path.

The groupings formed for H_2 , positive and negative groups, were analyzed using the Wilcoxon rank sum test with respect to questions 5, 7, 8, 9, 10, 11, 14, and 23 (Table 25). No statistical analysis could be performed on questions 11 and 14 since the one respondent who indicated a negative path did not answer these questions. Employing .05 significance level H_0 could not be rejected for any of the questions.

H4: Perceptions of supervisory style by those individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with

TABLE TWENTY-THREE- HYPOTHESIS ONE, POOLED DATA COMPANY A

TABLE OF GROUP BY Q26A

GROUP		Q26A		
FREQUENCY	PERCENT	ROW PCT	COL PCT	TOTAL
HIGH	25	1		26
	86.21	3.45		89.66
	96.15	3.85		
	92.59	50.00		
LOW	2	1		3
	6.90	3.45		10.34
	66.67	33.33		
	7.41	50.00		
TOTAL	27	2		29
	93.10	6.90		100.00

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.642	0.056
LIKELIHOOD RATIO CHI-SQUARE	1	2.259	0.133
CONTINUITY ADJ. CHI-SQUARE	1	0.497	0.481
MANTEL-MAENSZEL CHI-SQUARE	1	3.517	0.061
FISHER'S EXACT TEST (1-TAIL)			0.200
(2-TAIL)			0.200
PHI		0.354	
CONTINGENCY COEFFICIENT		0.334	
CRAMER'S V		0.354	

SAMPLE SIZE = 29

WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF GROUP BY Q33A

GROUP		Q33A		
FREQUENCY	PERCENT	ROW PCT	COL PCT	TOTAL
HIGH	25	1		26
	86.21	3.45		89.66
	96.15	3.85		
	92.59	50.00		
LOW	2	1		3
	6.90	3.45		10.34
	66.67	33.33		
	7.41	50.00		
TOTAL	27	2		29
	93.10	6.90		100.00

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	3.642	0.056
LIKELIHOOD RATIO CHI-SQUARE	1	2.259	0.133
CONTINUITY ADJ. CHI-SQUARE	1	0.497	0.481
MANTEL-MAENSZEL CHI-SQUARE	1	3.517	0.061
FISHER'S EXACT TEST (1-TAIL)			0.200
(2-TAIL)			0.200
PHI		0.354	
CONTINGENCY COEFFICIENT		0.334	
CRAMER'S V		0.354	

SAMPLE SIZE = 29

WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE TWENTY-FOUR- HYPOTHESIS TWO, POOLED DATA COMPANY A

TABLE OF GROUP BY Q26A

GROUP		Q26A		
FREQUENCY	PERCENT	ROW PCT	COL PCT	TOTAL
		AGREE	DISAG	
NEG	1	0		1
	3.23	0.00		3.23
	100.00	0.00		
	3.33	0.00		
POS	29	1		30
	93.55	3.23		96.77
	96.67	3.33		
	96.67	100.00		
TOTAL	30	1		31
	96.77	3.23		100.00

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.034	0.853
LIKELIHOOD RATIO CHI-SQUARE	1	0.067	0.796
CONTINUITY ADJ. CHI-SQUARE	1	0.000	1.000
MANTEL-HAENSZEL CHI-SQUARE	1	0.033	0.855
FISHER'S EXACT TEST (1-TAIL)			0.968
(2-TAIL)			1.000
PHI		0.033	
CONTINGENCY COEFFICIENT		0.033	
CRAMER'S V		0.033	

SAMPLE SIZE = 31
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE OF GROUP BY Q33A

GROUP		Q33A		
FREQUENCY	PERCENT	ROW PCT	COL PCT	TOTAL
		AGREE	DISAG	
NEG	1	0		1
	3.23	0.00		3.23
	100.00	0.00		
	3.33	0.00		
POS	29	1		30
	93.55	3.23		96.77
	96.67	3.33		
	96.67	100.00		
TOTAL	30	1		31
	96.77	3.23		100.00

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	0.034	0.853
LIKELIHOOD RATIO CHI-SQUARE	1	0.067	0.796
CONTINUITY ADJ. CHI-SQUARE	1	0.000	1.000
MANTEL-HAENSZEL CHI-SQUARE	1	0.033	0.855
FISHER'S EXACT TEST (1-TAIL)			0.968
(2-TAIL)			1.000
PHI		0.033	
CONTINGENCY COEFFICIENT		0.033	
CRAMER'S V		0.033	

SAMPLE SIZE = 31
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE TWENTY-FIVE- HYPOTHESIS THREE, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE 05 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	17.00	19.50	10.20
POS	37	724.00	721.50	10.20

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S^2 = 17.00$ $Z = -0.1960$ $PROB >|Z| = 0.8446$
 T-TEST APPROX. SIGNIFICANCE = 0.8457

ANALYSIS FOR VARIABLE 07 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	23.00	19.50	9.32
POS	37	718.00	721.50	9.32

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S^2 = 23.00$ $Z = 0.3152$ $PROB >|Z| = 0.7526$
 T-TEST APPROX. SIGNIFICANCE = 0.7544

ANALYSIS FOR VARIABLE 08 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	6.50	19.50	10.17
POS	37	734.50	721.50	10.17

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S^2 = 6.50$ $Z = -1.2289$ $PROB >|Z| = 0.2191$
 T-TEST APPROX. SIGNIFICANCE = 0.2269

ANALYSIS FOR VARIABLE 09 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	20.00	19.50	9.61
POS	37	721.00	721.50	9.61

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S^2 = 20.00$ $Z = 0.0000$ $PROB >|Z| = 1.0000$
 T-TEST APPROX. SIGNIFICANCE = 1.0000

ANALYSIS FOR VARIABLE 010 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	4.00	19.00	9.44
POS	36	699.00	684.00	9.44

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S^2 = 4.00$ $Z = -1.5354$ $PROB >|Z| = 0.1247$
 T-TEST APPROX. SIGNIFICANCE = 0.1334

ANALYSIS FOR VARIABLE 023 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	13.50	19.50	10.29
POS	37	727.50	721.50	10.29

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $S^2 = 13.50$ $Z = -0.5347$ $PROB >|Z| = 0.5928$
 T-TEST APPROX. SIGNIFICANCE = 0.5966

respect to questions 1, 2, 3, 6, 12, 13, 15, 16, 17, 19, 20, 21, and 32 using the Wilcoxon rank sum test (Table 26). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

The p values for questions 15 (.0926) and 20 (.0892), however, do indicate that some relationship exists. With respect to question 15, it appears that the individual who perceived a negative path also perceives that his superior does not ask for his advice while those who perceived a positive path generally felt that their supervisor asked for their advice. Additionally, the individual who perceived a negative path also indicated that the company does not set high performance goals (Q 20) on the other hand the positive group generally indicated that the company did set high performance goals. Both of these responses would be expected theoretically since the individual who perceives a negative path is likely to also feel that he is not as involved in the decision making process which affects the goals or standards and in turn the performance report.

H5: Motivation of individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 29, 30, 31, 36, and 37 using the Wilcoxon rank sum test (Table 27). Employing .05

TABLE TWENTY-SIX- HYPOTHESIS FOUR, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE 01 CLASSIFIED BY VARIABLE GROUP

AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
MEQ	1	0.50	19.50	10.19
POS	37	732.50	721.50	10.19

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 0.50 Z = -1.0307 PROB >|Z| = 0.3027
 T-TEST APPROX. SIGNIFICANCE = 0.3094

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ = 1.17 DF = 1 PROB > CHISQ = 0.2803

ANALYSIS FOR VARIABLE 02 CLASSIFIED BY VARIABLE GROUP

AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
MEQ	1	25.50	19.50	9.92
POS	37	715.50	721.50	9.92

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 25.50 Z = 0.5542 PROB >|Z| = 0.5795
 T-TEST APPROX. SIGNIFICANCE = 0.5828

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ = 0.37 DF = 1 PROB > CHISQ = 0.5455

ANALYSIS FOR VARIABLE 03 CLASSIFIED BY VARIABLE GROUP

AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
MEQ	1	0.00	19.50	10.09
POS	37	733.00	721.50	10.09

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 0.00 Z = -1.0098 PROB >|Z| = 0.2750
 T-TEST APPROX. SIGNIFICANCE = 0.2029

ANALYSIS FOR VARIABLE 04 CLASSIFIED BY VARIABLE GROUP

AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
MEQ	1	9.50	19.50	9.06
POS	37	731.50	721.50	9.06

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 9.50 Z = -0.9650 PROB >|Z| = 0.3301
 T-TEST APPROX. SIGNIFICANCE = 0.3404

ANALYSIS FOR VARIABLE 012 CLASSIFIED BY VARIABLE GROUP

AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
MEQ	1	23.00	19.50	9.16
POS	37	716.00	721.50	9.16

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 23.00 Z = 0.3276 PROB >|Z| = 0.7452
 T-TEST APPROX. SIGNIFICANCE = 0.7451

TABLE TWENTY-SIX- continued

ANALYSIS FOR VARIABLE 013 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	21.00	19.00	10.05
POS	36	682.00	684.00	10.05

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 21.00 Z= 0.1492 PROB >|Z|=0.8816
 T-TEST APPROX. SIGNIFICANCE=0.8822

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.04 Df= 1 PROB > CHISQ=0.8423

ANALYSIS FOR VARIABLE 015 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	34.50	19.50	9.81
POS	37	704.50	721.50	9.81

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 34.50 Z= 1.6821 PROB >|Z|=0.0926
 T-TEST APPROX. SIGNIFICANCE=0.1010

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 3.00 Df= 1 PROB > CHISQ=0.0831

ANALYSIS FOR VARIABLE 016 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	6.00	19.50	10.22
POS	37	735.00	721.50	10.22

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 6.00 Z= -1.2720 PROB >|Z|=0.2034
 T-TEST APPROX. SIGNIFICANCE=0.2113

ANALYSIS FOR VARIABLE 017 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	7.50	19.50	9.70
POS	37	735.50	721.50	9.70

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 7.50 Z= -1.1861 PROB >|Z|=0.2354
 T-TEST APPROX. SIGNIFICANCE=0.2431

ANALYSIS FOR VARIABLE 019 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	36.00	19.50	9.79
POS	37	765.00	721.50	9.79

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 36.00 Z= 1.6403 PROB >|Z|=0.1009
 T-TEST APPROX. SIGNIFICANCE=0.1094

TABLE TWENTY-SEVEN- HYPOTHESIS FIVE, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE Q29 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	10.00	19.50	9.42
POS	37	731.00	721.50	9.42

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S₀ 10.00 Z=0.9358 PROB >|Z|=0.3494

T-TEST APPROX. SIGNIFICANCE=0.3555

ANALYSIS FOR VARIABLE Q30 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	13.50	19.50	0.83
POS	37	727.50	721.50	0.83

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S₀ 13.50 Z=0.6220 PROB >|Z|=0.5334

T-TEST APPROX. SIGNIFICANCE=0.5373

ANALYSIS FOR VARIABLE Q31 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	11.50	19.00	9.16
POS	36	691.50	684.00	9.16

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S₀ 11.50 Z=-0.7661 PROB >|Z|=0.4448

T-TEST APPROX. SIGNIFICANCE=0.4498

ANALYSIS FOR VARIABLE Q36 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	10.50	19.50	9.59
POS	37	730.50	721.50	9.59

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S₀ 10.50 Z=-0.8861 PROB >|Z|=0.3754

T-TEST APPROX. SIGNIFICANCE=0.3813

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.88 Df= 1 PROB > CHISQ=0.3481

ANALYSIS FOR VARIABLE Q37 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
NEG	1	26.50	19.50	9.68
POS	37	714.50	721.50	9.68

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S₀ 26.50 Z=0.6712 PROB >|Z|=0.5021

T-TEST APPROX. SIGNIFICANCE=0.5063

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.52 Df= 1 PROB > CHISQ=0.4690

significance level H_0 could not be rejected with respect to any of the questions.

H6: Job facet perceptions of those who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 34, 35, and 38 - 52 using the Wilcoxon rank sum test (Table 28). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

H7: Perceived pay-performance linkage by those who perceive a positive path and those who perceive a negative path.

The positive and negative groups were compared with respect to questions 27 and 28 using the Wilcoxon rank sum test (Table 29). Employing .05 significance level H_0 could not be rejected with respect to either of the questions.

H8: Perceived performance (self-reported) of managers who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to question 61 using the Wilcoxon rank sum test

TABLE TWENTY-EIGHT- HYPOTHESIS SIX, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE 034 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 039 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	20.50	9.42	MEQ	1	0.50	19.50
POS	37	728.50	9.42	POS	37	732.50	9.48
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 20.50 Z = 0.0531 PROB > Z = 0.9577				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 8.50 Z = -1.1070 PROB > Z = 0.2680			
T-TEST APPROX. SIGNIFICANCE = 0.9500				T-TEST APPROX. SIGNIFICANCE = 0.2751			
ANALYSIS FOR VARIABLE 035 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	30.00	10.48	MEQ	1	25.00	19.50
POS	37	711.00	10.48	POS	37	710.00	8.75
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 30.00 Z = 0.9530 PROB > Z = 0.3402				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 25.00 Z = 0.3712 PROB > Z = 0.3479			
T-TEST APPROX. SIGNIFICANCE = 0.3464				T-TEST APPROX. SIGNIFICANCE = 0.3713			
ANALYSIS FOR VARIABLE 036 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 041 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
MEQ	1	26.00	9.16	MEQ	1	22.50	19.50
POS	37	715.00	9.16	POS	37	716.50	6.95
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 26.00 Z = 0.6552 PROB > Z = 0.5123				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 22.50 Z = 0.3596 PROB > Z = 0.7191			
T-TEST APPROX. SIGNIFICANCE = 0.5164				T-TEST APPROX. SIGNIFICANCE = 0.7212			

TABLE TWENTY-EIGHT- continued

ANALYSIS FOR VARIABLE 042 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	25.00	19.50	10.41
P05	37	710.00	721.50	10.41

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 25.00 Z = 0.2882 PROB >|Z| = 0.7732
T-TEST APPROX. SIGNIFICANCE = 0.7748

ANALYSIS FOR VARIABLE 043 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	19.50	19.50	10.24
P05	37	721.50	721.50	10.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 19.50 Z = 0.0468 PROB >|Z| = 0.9611
T-TEST APPROX. SIGNIFICANCE = 0.9611

ANALYSIS FOR VARIABLE 044 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	35.00	19.50	10.49
P05	37	706.00	721.50	10.49

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 35.00 Z = 1.4305 PROB >|Z| = 0.1524
T-TEST APPROX. SIGNIFICANCE = 0.1610

ANALYSIS FOR VARIABLE 045 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	34.50	19.50	10.00
P05	37	706.50	721.50	10.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 34.50 Z = 1.4301 PROB >|Z| = 0.1501
T-TEST APPROX. SIGNIFICANCE = 0.1505

ANALYSIS FOR VARIABLE 046 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	10.50	19.50	10.36
P05	37	750.50	721.50	10.36

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 10.50 Z = -0.8203 PROB >|Z| = 0.4121
T-TEST APPROX. SIGNIFICANCE = 0.4173

ANALYSIS FOR VARIABLE 047 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
MEQ	1	15.00	19.50	10.43
P05	37	726.00	721.50	10.43

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 15.00 Z = -0.3761 PROB >|Z| = 0.7067
T-TEST APPROX. SIGNIFICANCE = 0.7089

TABLE TWENTY-EIGHT- continued

ANALYSIS FOR VARIABLE Q40 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	24.50	19.50	9.35
POS	37	714.50	721.50	9.35

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 26.50 Z= 0.4966 PROB >|Z|=0.6261

T-TEST APPROX. SIGNIFICANCE=0.4994

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.56 DF= 1 PROB > CHISQ=0.4532

ANALYSIS FOR VARIABLE Q49 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	25.00	19.50	9.72
POS	37	716.00	721.50	9.72

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 25.00 Z= 0.5734

T-TEST APPROX. SIGNIFICANCE=0.5498

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.40 DF= 1 PROB > CHISQ=0.5282

ANALYSIS FOR VARIABLE Q50 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	24.50	19.50	8.49
POS	37	710.50	721.50	8.49

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 26.50 Z= 0.5324 PROB >|Z|=0.5944

T-TEST APPROX. SIGNIFICANCE=0.5976

ANALYSIS FOR VARIABLE Q51 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	23.50	19.50	7.81
POS	37	717.50	721.50	7.81

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 23.50 Z= 0.4484 PROB >|Z|=0.6559

T-TEST APPROX. SIGNIFICANCE=0.6569

ANALYSIS FOR VARIABLE Q52 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO
NEG	1	23.50	19.50	7.81
POS	37	717.50	721.50	7.81

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 23.50 Z= 0.4484 PROB >|Z|=0.6559

T-TEST APPROX. SIGNIFICANCE=0.6569

TABLE TWENTY-NINE- HYPOTHESIS SEVEN, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE Q27 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	21.50	19.50	9.73	21.50
POS	37	719.50	721.50	9.73	19.45

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 21.50 Z= 0.1541 PROB >|Z|=0.8775

T-TEST APPROX. SIGNIFICANCE=0.8783

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.04 DF= 1 PROB > CHISQ=0.8372

ANALYSIS FOR VARIABLE Q28 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
NEG	1	6.00	19.50	10.61	6.00
POS	37	735.00	721.50	10.61	19.86

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 6.00 Z=-1.2247 PROB >|Z|=0.2207

T-TEST APPROX. SIGNIFICANCE=0.2204

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.62 DF= 1 PROB-> CHISQ=0.2034

(Table 30). Employing .05 significance level H_0 could not be rejected.

H9: The perceived performance of those managers who reported a strong pay-performance linkage and those who reported a weak pay-performance linkage.

First the respondents were grouped according to their pay-performance linkage based on questions 27 and 28. Those individuals whose responses totaled 7 or less were classified as the strong pay-performance group (SPF), those whose responses totaled 8 were dropped from this analysis, and those whose responses totaled 9 or more were classified as the weak pay-performance group (WPP). Next these groups were compared with respect to questions 61 and 62 using the Wilcoxon rank sum test (Table 31). Employing .05 significance level H_0 could not be rejected with respect to either question. Question 61 (.0946), however, does indicate some relationship exists. A review of the responses indicates that those individuals with the WPP linkage tended to assign higher rankings (4's & 5's) to themselves.

The results of H9, for plant two singularly, are presented in Table 32 with essentially similar results. A RCB design was utilized with respect to questions 1-53 with managerial levels serving as treatments and blocking on departments.

TABLE THIRTY- HYPOTHESIS EIGHT, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE Q61 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H ₀	STD DEV UNDER H ₀	MEAN SCORE
NEG	1	3.00	19.00	9.75	3.00
POS	36	700.00	684.00	9.75	19.44

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² 3.00 Z=-1.5891 PROB >|Z|=0.1120

T-TEST APPROX. SIGNIFICANCE=0.1200

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 2.69 DF= 1 PROB > CHISQ=0.1009

TABLE THIRTY-ONE- HYPOTHESIS NINE, POOLED DATA COMPANY A

ANALYSIS FOR VARIABLE 061 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	35	666.50	700.00	19.74	19.04
MPP	4	113.50	80.00	19.74	28.38

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 113.50 Z= 1.6717 PROB >|Z|=0.0966

T-TEST APPROX. SIGNIFICANCE=0.1028

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 2.88 DF= 1 PROB > CHISQ=0.0897

ANALYSIS FOR VARIABLE 06200 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	35	677.00	700.00	20.28	19.34
MPP	4	103.00	80.00	20.28	25.75

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 103.00 Z= 1.1095 PROB >|Z|=0.2672

T-TEST APPROX. SIGNIFICANCE=0.2742

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.29 DF= 1 PROB > CHISQ=0.2567

TABLE THIRTY-TWO- HYPOTHESIS NINE, COMPANY A PLANT TWO

ANALYSIS FOR VARIABLE 061 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	22	270.00	275.00	8.38	12.27
MPP	2	30.00	25.00	8.38	15.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 30.00 Z= 0.5373 PROB >|Z|=0.5911

T-TEST APPROX. SIGNIFICANCE=0.5962

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.36 DF= 1 PROB > CHISQ=0.5505

ANALYSIS FOR VARIABLE 06200 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	22	266.50	275.00	8.84	12.02
MPP	2	35.50	25.00	8.84	17.75

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 35.50 Z= 1.1317 PROB >|Z|=0.2577

T-TEST APPROX. SIGNIFICANCE=0.2694

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.41 DF= 1 PROB > CHISQ=0.2347

Although a significant difference exists across managerial levels the analysis using Duncan's Multiple Range Test (Table 33) indicates that generally the responses were similar with the most notable differences occurring between the plant manager, and departmental managers and assistant managers. Performance rankings (Q 62) were also analyzed using a RCB design, again blocking on departments and using managerial levels as treatments, which indicated that there was a significant difference across managerial levels. Further analysis between levels indicated that plant managers were different from supervisors (.0143059), and supervisors were different from departmental supervisors (.0384542) and assistant supervisors (.0227278). Additionally, Table 34 presents the responses of all individuals to all questions.

TABLE THIRTY-THREE- QUESTIONNAIRE RESPONSE COMPARISON, COMPANY A

GENERAL LINEAR MODELS PROCEDURE PLANT TWO

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	D-SQUARE	C.V.
MODEL	81	4527.18238996	55.69114862	28.63	0.0001	0.685939	41.6664
ERROR	1588	2944.17358491	1.95236075				RESP MEAN
CORRECTED TOTAL	1589	7471.35597484					3.35365912

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
BLOCK	52	4289.22264151	82.25	0.0001	52	4289.22264151	82.25	0.0001
TREAT	29	237.93974843	8.28	0.0001	29	237.93974843	8.28	0.0001

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

ALPHA=0.05 DF=1588 MSE=1.95237

NUMBER OF MEANS	CRITICAL RANGE	3	4	5	6	7	8	9	10	11
CRITICAL RANGE	0.539287	0.584899	0.598339	0.609649	0.618894	0.626958	0.632784	0.637919	0.64232	
NUMBER OF MEANS	CRITICAL RANGE	12	13	14	15	16	17	18	19	20
CRITICAL RANGE	0.646072	0.6493	0.652101	0.654369	0.656182	0.658609	0.66231	0.665188	0.668522	
NUMBER OF MEANS	CRITICAL RANGE	21	22	23	24	25	26	27	28	29
CRITICAL RANGE	0.667911	0.669258	0.670553	0.671791	0.672969	0.674085	0.675139	0.676134	0.67707	

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	TREAT
A	4.3208	53 24
A	4.3208	53 28
A	3.8382	53 26
C	3.6901	53 5
C	3.6684	53 8
C	3.6415	53 14
C	3.6038	53 27
C	3.5283	53 22
C	3.4986	53 12
C	3.4717	53 10
C	3.4717	53 1
C	3.3962	53 29
C	3.3585	53 28
C	3.3585	53 23
C	3.3019	53 18
C	3.2838	53 15
C	3.2642	53 19
B	3.2642	53 3
B	3.2642	53 9
B	3.2453	53 13
B	3.2264	53 21
B	3.2075	53 17
B	3.1887	53 11
B	3.1698	53 30
B	3.0566	53 4
B	2.9623	53 2
B	2.9057	53 25
B	2.9057	53 7
B	2.7547	53 16

**APPENDIX H-COMPANY B, PLANT ONE
STATISTICAL ANALYSIS OF HYPOTHESES**

H1: Perceptions of equitability of the performance report with respect to its perceived use (high or low) for performance evaluation purposes.

First the respondents were grouped on question 4 (all questions came from Appendix E), responses 1-3 formed the high use group and responses 5-7 formed the low use group. Individuals who responded to the question by answering N (neither) were eliminated from this part of the analysis. These groups were then analyzed with respect to questions 26 (Q26A) and 33 (Q33A) using the Chi-Square test of independence (Table 35). No respondents indicated disagree or low use so no analysis could be done regarding Q26A and Q33A.

H2: Perceptions of equitability with respect to positive and negative path perceptions

First the respondents were grouped according to their responses to questions 24 and 25, if the responses totaled 7 or less they were placed in the positive path group, 8 discarded for this part of the analysis, and 9 or more formed the negative path group. Next these groups' responses to questions 26 and 33 were analyzed using the Chi-Square test of independence (Table 36). Since none of the respondents perceived the performance report to be

TABLE THIRTY-FIVE- HYPOTHESIS ONE, COMPANY B PLANT ONE

TABLE OF GROUP BY Q26A

GROUP Q26A			
FREQUENCY	PERCENT		
ROW PCT	COL PCT	AGREE	TOTAL
NIG		8	8
		100.00	100.00
		100.00	
		100.00	
TOTAL		8	8
		100.00	100.00

TABLE OF GROUP BY Q33A

GROUP Q33A				
FREQUENCY	PERCENT			
ROW PCT	COL PCT	AGREE	DISAG	TOTAL
NIG		7	1	8
		87.50	12.50	100.00
		87.50	12.50	
		100.00	100.00	
TOTAL		7	1	8
		87.50	12.50	100.00

TABLE THIRTY-SIX- HYPOTHESIS TWO, COMPANY B PLANT ONE

TABLE OF GROUP BY Q26A

GROUP		Q26A	
POS	FREQUENCY	AGREE	TOTAL
	PERCENT		
	ROW PCT		
	COL PCT		
POS		9	9
		100.00	100.00
		100.00	
		100.00	
TOTAL		9	9
		100.00	100.00

TABLE OF GROUP BY Q33A

GROUP		Q33A		
POS	FREQUENCY	AGREE	DISAG	
	PERCENT			
	ROW PCT			
	COL PCT		TOTAL	
POS		7	2	9
		77.78	22.22	100.00
		77.78	22.22	
		100.00	100.00	
TOTAL		7	2	9
		77.78	22.22	100.00

inequitable (disagree) for Q26, and none perceived a negative path for Q33 no statistical analysis could be performed. Thus H0 could not be accepted or rejected.

H3: Perceptions regarding task role characteristics by those who perceived a positive path and those who perceived a negative path.

The groupings formed for H2, positive and negative groups, were analyzed using the Wilcoxon rank sum test with respect to questions 5, 7, 8, 9, 10, 11, 14, and 23 (Table 37). Employing .05 significance level H0 could not be rejected except for question 7 (.0194). The negative path individual indicated he neither agreed nor disagreed that just doing his job gave him chances to figure out how well he was doing.

H4: Perceptions of supervisory style by those individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 1, 2, 3, 6, 12, 13, 15, 16, 17, 19, 20, 21, and 32 using the Wilcoxon rank sum test (Table 38). Employing .05 significance level H0 could not be rejected with respect to any of the questions.

TABLE THIRTY-SEVEN- HYPOTHESIS THREE, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE 05 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	84.00	84.00	3.42
NEG	1	7.00	7.00	3.42

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 7.00$ $Z_0 = 0.1462$ $PROB > |Z| = 0.0037$

T-TEST APPROX. SIGNIFICANCE = 0.0042

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI_{50} = 0.00$ $DF = 1$ $PROB > CHI_{50} = 1.0000$

ANALYSIS FOR VARIABLE 07 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	76.00	84.00	2.55
NEG	1	15.00	7.00	2.55

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 15.00$ $Z_0 = 2.3371$ $PROB > |Z| = 0.0194$

T-TEST APPROX. SIGNIFICANCE = 0.0374

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI_{50} = 6.50$ $DF = 1$ $PROB > CHI_{50} = 0.0100$

ANALYSIS FOR VARIABLE 08 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.00	84.00	3.50
NEG	1	12.00	7.00	3.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 12.00$ $Z_0 = 1.3262$ $PROB > |Z| = 0.1050$

T-TEST APPROX. SIGNIFICANCE = 0.2005

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI_{50} = 2.10$ $DF = 1$ $PROB > CHI_{50} = 0.1507$

ANALYSIS FOR VARIABLE 09 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	78.50	84.00	3.44
NEG	1	12.50	7.00	3.44

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 12.50$ $Z_0 = 1.4327$ $PROB > |Z| = 0.1465$

T-TEST APPROX. SIGNIFICANCE = 0.1719

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI_{50} = 2.55$ $DF = 1$ $PROB > CHI_{50} = 0.1100$

TABLE THIRTY-SEVEN- continued

ANALYSIS FOR VARIABLE Q10 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	81.30	84.00	3.43
NEG	1	9.50	7.00	3.43

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S. 9.50 Z= 0.5830 PROB >|Z|=0.5509
 T-TEST APPROX. SIGNIFICANCE=0.5707
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 0.53 DF= 1 PROB > CHI30=0.4662

ANALYSIS FOR VARIABLE Q14 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	80.00	84.00	3.41
NEG	1	11.00	7.00	3.41

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S. 11.00 Z= 1.0253 PROB >|Z|=0.3092
 T-TEST APPROX. SIGNIFICANCE=0.3255
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 1.37 DF= 1 PROB > CHI30=0.2413

ANALYSIS FOR VARIABLE Q11 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.00	84.00	3.55
NEG	1	12.00	7.00	3.55

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S. 12.00 Z= 1.2689 PROB >|Z|=0.2049
 T-TEST APPROX. SIGNIFICANCE=0.2265
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 1.99 DF= 1 PROB > CHI30=0.1586

ANALYSIS FOR VARIABLE Q23 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	80.00	84.00	3.54
NEG	1	11.00	7.00	3.54

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S. 11.00 Z= 0.9884 PROB >|Z|=0.3229
 T-TEST APPROX. SIGNIFICANCE=0.3425
 KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHI30= 1.28 DF= 1 PROB > CHI30=0.2564

TABLE THIRTY-EIGHT- HYPOTHESIS FOUR, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE 01 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	78.00	64.00	3.33
NEG	1	12.00	7.00	3.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 12.00 Z= 1.0704 PROB >|Z|=0.1390
 T-TEST APPROX. SIGNIFICANCE=0.1640

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 2.43 Df= 1 PROB > CHISQ=0.1017

ANALYSIS FOR VARIABLE 02 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	76.00	64.00	3.33
NEG	1	13.00	7.00	3.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 13.00 Z= 1.6525 PROB >|Z|=0.0994
 T-TEST APPROX. SIGNIFICANCE=0.1243

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 3.23 Df= 1 PROB > CHISQ=0.0714

ANALYSIS FOR VARIABLE 03 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.00	64.00	3.33
NEG	1	12.00	7.00	3.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 12.00 Z= 1.2847 PROB >|Z|=0.1000
 T-TEST APPROX. SIGNIFICANCE=0.2231

ANALYSIS FOR VARIABLE 04 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	82.00	64.00	3.33
NEG	1	9.00	7.00	3.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 9.00 Z= 0.4507 PROB >|Z|=0.6522
 T-TEST APPROX. SIGNIFICANCE=0.6602

ANALYSIS FOR VARIABLE 012 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	78.00	64.00	3.33
NEG	1	13.00	7.00	3.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 13.00 Z= 1.6525 PROB >|Z|=0.0994
 T-TEST APPROX. SIGNIFICANCE=0.1243

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 3.23 Df= 1 PROB > CHISQ=0.0714

TABLE THIRTY-EIGHT- continued

ANALYSIS FOR VARIABLE Q13 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.50	84.00	3.32
NEG	1	11.50	7.00	3.52

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 11.50 Z = 1.1349 PROB >|Z| = 0.2564
 T-TEST APPROX. SIGNIFICANCE = 0.2784

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ = 1.63 DF = 1 PROB > CHISQ = 0.2017

ANALYSIS FOR VARIABLE Q15 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	78.50	84.00	3.50
NEG	1	12.50	7.00	3.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 12.50 Z = 1.4297 PROB >|Z| = 0.1520
 T-TEST APPROX. SIGNIFICANCE = 0.1783

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ = 2.47 DF = 1 PROB > CHISQ = 0.1150

ANALYSIS FOR VARIABLE Q16 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	87.50	84.00	3.50
NEG	1	3.50	7.00	3.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 3.50 Z = -0.8565 PROB >|Z| = 0.3917
 T-TEST APPROX. SIGNIFICANCE = 0.4003

ANALYSIS FOR VARIABLE Q17 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	78.50	84.00	3.25
NEG	1	12.50	7.00	3.25

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 12.50 Z = 1.5374 PROB >|Z| = 0.1242
 T-TEST APPROX. SIGNIFICANCE = 0.1501

ANALYSIS FOR VARIABLE Q19 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	86.50	84.00	3.22
NEG	1	4.50	7.00	5.22

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S² = 4.50 Z = -0.6264 PROB >|Z| = 0.5340
 T-TEST APPROX. SIGNIFICANCE = 0.5464

TABLE THIRTY-EIGHT- continued

ANALYSIS FOR VARIABLE Q20 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	12	81.50	84.00	3.36	6.79
NEG	1	9.50	7.00	3.36	9.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 9.50 Z= 0.5948 PROB >|Z|=0.5520

T-TEST APPROX. SIGNIFICANCE=0.5630

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.55 DF= 1 PROB > CHISQ=0.4572

ANALYSIS FOR VARIABLE Q21 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	12	86.50	84.00	3.22	7.21
NEG	1	4.50	7.00	3.22	4.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 4.50 Z=-0.6206 PROB >|Z|=0.5348

T-TEST APPROX. SIGNIFICANCE=0.5464

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.60 DF= 1 PROB > CHISQ=0.4379

ANALYSIS FOR VARIABLE Q32 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	12	83.00	84.00	3.53	6.92
NEG	1	8.00	7.00	3.53	8.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 8.00 Z= 0.1416 PROB >|Z|=0.8874

T-TEST APPROX. SIGNIFICANCE=0.8897

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.08 DF= 1 PROB > CHISQ=0.7770

The p values for questions 2 (.0984) and 12 (.0984), however, do indicate that some relationship exists. With respect to question 2, the individual who perceived a negative path also neither agreed nor disagreed with the statement that he could speak frankly with his supervisor. Additionally, the individual who perceived a negative path also indicated that he only somewhat agreed that his supervisor was flexible (Q15).

H5: Motivation of individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 29, 30, 31, 36, and 37 using the Wilcoxon rank sum test (Table 39). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

H6: Job facet perceptions of those who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 34, 35, and 38 - 52 using the Wilcoxon rank sum test (Table 40). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

TABLE THIRTY-NINE- HYPOTHESIS FIVE, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE Q29 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	80.50	84.00	3.24
NEG	1	18.50	7.00	3.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 18.50 Z= 0.9258 PROB >|Z|=0.3949

T-TEST APPROX. SIGNIFICANCE=0.3720

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.17 DF= 1 PROB > CHISQ=0.2801

ANALYSIS FOR VARIABLE Q30 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	85.50	84.00	2.74
NEG	1	5.50	7.00	2.74

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 5.50 Z= -0.3651 PROB >|Z|=0.7150

T-TEST APPROX. SIGNIFICANCE=0.7214

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.30 DF= 1 PROB > CHISQ=0.5830

ANALYSIS FOR VARIABLE Q31 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	81.00	84.00	3.24
NEG	1	10.00	7.00	3.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 10.00 Z= 0.7715 PROB >|Z|=0.4404

T-TEST APPROX. SIGNIFICANCE=0.4553

ANALYSIS FOR VARIABLE Q36 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	88.50	84.00	3.24
NEG	1	18.50	7.00	3.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 18.50 Z= 0.9258 PROB >|Z|=0.3949

T-TEST APPROX. SIGNIFICANCE=0.3720

ANALYSIS FOR VARIABLE Q37 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.00	84.00	3.24
NEG	1	12.00	7.00	3.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 12.00 Z= 1.3812 PROB >|Z|=0.1672

T-TEST APPROX. SIGNIFICANCE=0.1924

TABLE FORTY- HYPOTHESIS SIX, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE Q39 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	87.00	84.00	3.06
NEG	1	4.00	7.00	3.04

MILCOBOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 4.00 Z=0.8178 PROB >|Z|=0.4133
T-TEST APPROX. SIGNIFICANCE=0.4294

ANALYSIS FOR VARIABLE Q40 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	89.00	84.00	2.35
NEG	1	2.00	7.00	2.35

MILCOBOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 2.00 Z=-1.9121 PROB >|Z|=0.0559
T-TEST APPROX. SIGNIFICANCE=0.0080

ANALYSIS FOR VARIABLE Q41 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	83.00	84.00	2.35
NEG	1	0.00	7.00	2.35

MILCOBOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 0.00 Z=0.2125 PROB >|Z|=0.8317
T-TEST APPROX. SIGNIFICANCE=0.8333

ANALYSIS FOR VARIABLE Q36 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.00	84.00	3.26
NEG	1	12.00	7.00	3.26

MILCOBOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 12.00 Z=1.3737 PROB >|Z|=0.1698
T-TEST APPROX. SIGNIFICANCE=0.1944

ANALYSIS FOR VARIABLE Q35 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	79.50	84.00	3.30
NEG	1	11.50	7.00	3.30

MILCOBOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 11.50 Z=1.1177 PROB >|Z|=0.2637
T-TEST APPROX. SIGNIFICANCE=0.2834

ANALYSIS FOR VARIABLE Q38 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBOM SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	86.00	84.00	3.26
NEG	1	5.00	7.00	3.26

MILCOBOM 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 5.00 Z=-0.4484 PROB >|Z|=0.6492
T-TEST APPROX. SIGNIFICANCE=0.6533

TABLE FORTY- continued

ANALYSIS FOR VARIABLE 042 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 045 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	LEVEL	N	SUM OF SCORES
POS	12	64.50	64.00	3.44	POS	12	64.50
NEG	1	4.50	7.00	3.64	NEG	1	4.50
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z=0.5496 PROB > Z =0.5830				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z=0.5830 PROB > Z =0.5500			
T-TEST APPROX. SIGNIFICANCE=0.5930				T-TEST APPROX. SIGNIFICANCE=0.3707			
ANALYSIS FOR VARIABLE 043 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 046 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	LEVEL	N	SUM OF SCORES
POS	12	64.00	64.00	3.61	POS	12	67.50
NEG	1	7.00	7.00	3.61	NEG	1	3.50
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z=0.1303 PROB > Z =0.8899				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z=0.8439 PROB > Z =0.3976			
T-TEST APPROX. SIGNIFICANCE=0.8922				T-TEST APPROX. SIGNIFICANCE=0.4191			
ANALYSIS FOR VARIABLE 044 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 047 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	LEVEL	N	SUM OF SCORES
POS	12	64.50	64.00	3.43	POS	12	68.00
NEG	1	4.50	7.00	3.63	NEG	1	3.00
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z=0.5514 PROB > Z =0.5815				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) Z=0.9915 PROB > Z =0.3218			
T-TEST APPROX. SIGNIFICANCE=0.5914				T-TEST APPROX. SIGNIFICANCE=0.3418			

TABLE FORTY- continued

ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	97.00	99.00	3.33
NEG	1	0.00	7.00	3.33

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 0.00 Z=-0.7312 PROB >|Z|=0.4526

T-TEST APPROX. SIGNIFICANCE=0.4470

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI50= 0.01 DF= 1 PROB > CHI50=0.3674

ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	99.00	94.00	3.45
NEG	1	1.00	7.00	3.45

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 1.00 Z=-1.5534 PROB >|Z|=0.1106

T-TEST APPROX. SIGNIFICANCE=0.1366

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI50= 3.03 DF= 1 PROB > CHI50=0.0810

ANALYSIS FOR VARIABLE 050 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	89.00	84.00	3.23
NEG	1	2.00	7.00	3.23

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 2.00 Z=-1.3037 PROB >|Z|=0.1663

T-TEST APPROX. SIGNIFICANCE=0.1917

ANALYSIS FOR VARIABLE 051 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	90.00	84.00	3.39
NEG	1	1.00	7.00	3.39

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 1.00 Z=-1.6266 PROB >|Z|=0.1043

T-TEST APPROX. SIGNIFICANCE=0.1302

ANALYSIS FOR VARIABLE 052 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	12	88.00	84.00	3.16
NEG	1	3.00	7.00	3.16

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 3.00 Z=-1.1866 PROB >|Z|=0.2600

T-TEST APPROX. SIGNIFICANCE=0.2901

Question 40 ($p = .0559$) does, however, seem to suggest that the individual on the negative path perceives salary and bonus to be less important than those on the positive path.

H7: Perceived pay-performance linkage by those who perceive a positive path and those who perceive a negative path.

The positive and negative groups were compared with respect to questions 27 and 28 using the Wilcoxon rank sum test (Table 41). Employing .05 significance level H_0 could not be rejected with respect to either of the questions.

H8: Perceived performance (self-reported) of managers who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to question 61 using the Wilcoxon rank sum test (Table 42). Employing .05 significance level H_0 could not be rejected.

H9: The perceived performance of those managers who reported a strong pay-performance linkage and those who reported a weak pay-performance linkage.

First the respondents were grouped according to their pay-

TABLE FORTY-ONE- HYPOTHESIS SEVEN, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE Q27 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	MEAN SCORE
POS	12	78.00	84.00	3.61	6.50
NEG	1	15.00	7.00	3.61	15.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 15.00 Z= 1.5254 PROB >|Z|=0.1272

T-TEST APPROX. SIGNIFICANCE=0.1531

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 2.77 DF= 1 PROB > CHISQ=0.0961

ANALYSIS FOR VARIABLE Q28 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	MEAN SCORE
POS	12	79.00	84.00	3.59	6.58
NEG	1	12.00	7.00	3.59	12.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 12.00 Z= 1.2537 PROB >|Z|=0.2100

T-TEST APPROX. SIGNIFICANCE=0.2338

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.94 DF= 1 PROB > CHISQ=0.1636

TABLE FORTY-TWO- HYPOTHESIS EIGHT, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE Q61 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER NO	STD DEV UNDER NO	MEAN SCORE
POS	12	87.00	84.00	3.33	7.25
NEG	1	4.00	7.00	3.33	4.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 4.00 Z=-0.7312 PROB >|Z|=0.4526

T-TEST APPROX. SIGNIFICANCE=0.4670

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 0.81 DF= 1 PROB > CHISQ=0.3674

performance linkage based on questions 27 and 28. Those individuals whose responses totaled 7 or less were classified as the strong pay-performance group (SPP), those whose responses totaled 8 were dropped from this analysis, and those whose responses totaled 9 or more were classified as the weak pay-performance group (WPP). Next these groups were compared with respect to questions 61 and 62 using the Wilcoxon rank sum test (Table 43). Employing .05 significance level H_0 could not be rejected with respect to either question.

A RCB design was used to analyze responses to questions 1-53 with managerial levels serving as treatments and blocking on departments. Although significant differences exist across managerial levels, Duncan's Multiple Range Test indicates that the managers' responses are similar except that the plant manager's responses are different from the departmental managers (Table 44). The performance rankings (Q 62) were also analyzed using a RCB design, with managerial levels serving as treatments and blocking on departments, which indicated significant differences (.0338949) between the rankings assigned by the plant manager and division managers. Additionally, the responses to all questions are contained in Table 45.

TABLE FORTY-THREE- HYPOTHESIS NINE, COMPANY B PLANT ONE

ANALYSIS FOR VARIABLE Q61 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	8	52.00	48.00	4.43	6.50
MPP	3	14.00	18.00	4.43	4.67

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 14.00 Z=0.7898 PROB >|Z|=0.4296

T-TEST APPROX. SIGNIFICANCE=0.4479

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.81 DF= 1 PROB > CHISQ=0.3667

ANALYSIS FOR VARIABLE Q6200 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	8	48.00	48.00	4.44	6.00
MPP	3	18.00	18.00	4.44	6.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 18.00 Z= 0.1125 PROB >|Z|=0.9104

T-TEST APPROX. SIGNIFICANCE=0.9126

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.00 DF= 1 PROB > CHISQ=1.0000

TABLE FORTY-FOUR- QUESTIONNAIRE RESPONSE COMPARISON, COMPANY B PLANT ONE

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE, RESP	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
SOURCE							
MODEL	64	1695.78889869	26.46549864	13.11	0.0001	0.973378	66.7639
ERROR	624	1259.23876923	2.01799883		ROOT MSE		RESP MEAN
CORRECTED TOTAL	688	2955.01866792			1.42856257		3.03773585

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
BLOCK	52	1615.78889869	15.40	0.0001	52	1615.78889869	15.40	0.0001
TREAT	12	78.00000000	3.22	0.0002	12	78.00000000	3.22	0.0002

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE, RESP
NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=624 MSE=2.018

NUMBER OF MEANS	CRITICAL RANGE	2	3	4	5	6	7
	0.598195	0.576461	0.594609	0.608312	0.619011	0.62921	
NUMBER OF MEANS	CRITICAL RANGE	8	9	10	11	12	13
	0.6365	0.64325	0.648552	0.653026	0.656861	0.660123	

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	M	TREAT
A	3.6981	53	7
A	3.4528	53	4
A	3.4340	53	8
A	3.1887	53	9
A	3.1887	53	6
A	3.1509	53	11
A	3.0189	53	2
B	2.8491	53	5
B	2.8302	53	1
B	2.7547	53	13
B	2.7358	53	12
B	2.6415	53	3
B	2.5472	53	10

**APPENDIX I- COMPANY B, PLANT TWO
STATISTICAL ANALYSIS OF HYPOTHESES**

H1: Perceptions of equitability of the performance report with respect to its perceived use (high or low) for performance evaluation purposes.

First the respondents were grouped on question 4 (all questions came from Appendix E), responses 1-3 formed the high use group and responses 5-7 formed the low use group. Individuals who responded to the question by answering N (neither) were eliminated from this part of the analysis. These groups were then analyzed with respect to questions 26 (Q26A) and 33 (Q33A) using the Chi-Square test of independence (Table 46). Since no disagree existed with respect to Q26A no statistical analysis could be performed. Due to the small size in three cells with respect to Q33A H0 could not be accepted or rejected.

H2: Perceptions of equitability with respect to positive and negative path perceptions

First the respondents were grouped according to their responses to questions 24 and 25, if the responses totaled 7 or less they were placed in the positive path group, 8 discarded for this part of the analysis, and 9 or more formed the negative path group. Next these groups' responses to questions 26 and 33 were analyzed using the Chi-Square test of independence (Table 47). Since none of

TABLE FORTY-SIX- HYPOTHESIS ONE, COMPANY B PLANT TWO

TABLE OF GROUP BY Q26A

GROUP		Q26A		
FREQUENCY	PERCENT	AGREE		TOTAL
		ROW PCT	COL PCT	
NIG	13	92.86	100.00	13
		92.86	92.86	
LOW	1	7.14	100.00	1
		7.14	7.14	
TOTAL	14	100.00	100.00	14

TABLE OF GROUP BY Q33A

GROUP		Q33A		
FREQUENCY	PERCENT	AGREE		TOTAL
		ROW PCT	COL PCT	
NIG	13	85.71	7.14	13
		92.31	7.69	
		100.00	50.00	
LOW	1	0.00	7.14	1
		0.00	100.00	
		0.00	50.00	
TOTAL	14	85.71	14.29	14

STATISTICS FOR TABLE OF GROUP BY Q33A

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.462	0.011
LIKELIHOOD RATIO CHI-SQUARE	1	4.432	0.033
CONTINUITY ADJ. CHI-SQUARE	1	1.122	0.290
MANTEL-MAENSZEL CHI-SQUARE	1	6.800	0.014
FISHER'S EXACT TEST (1-TAIL)			0.143
(2-TAIL)			0.143
PHI		0.679	
CONTINGENCY COEFFICIENT		0.562	
CRAMER'S V		0.679	

SAMPLE SIZE = 14
 WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS
 THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

the respondents perceived the performance report to represent a negative path no statistical analysis could be performed. Thus H0 could not be accepted or rejected.

Since no negative path individuals existed no analysis could be performed with respect to hypothesis 3-8 therefore the data from all Company B plants was pooled and the following hypotheses are analyzed with respect to the pooled data. H1 and H2 with respect to the pooled data were as usual, either no analysis could be performed due to missing quadrants or small numbers existed in three cells and H0 could not be accepted or rejected (Tables 48 and 49).

H3: Perceptions regarding task role characteristics by those who perceived a positive path and those who perceived a negative path.

The groupings formed for H2, positive and negative groups, were analyzed using the Wilcoxon rank sum test with respect to questions 5, 7, 8, 9, 10, 11, 14, and 23 (Table 50). Employing .05 significance level H0 could not be rejected.

H4: Perceptions of supervisory style by those individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with

TABLE FORTY-SEVEN- HYPOTHESIS TWO, COMPANY B PLANT TWO

TABLE OF GROUP BY Q26A

GROUP		Q26A	
FREQUENCY	PERCENT		
ROW PCT	COL PCT	AGREE	TOTAL
POS		14	14
		100.00	100.00
		100.00	
		100.00	
TOTAL		14	14
		100.00	100.00

TABLE OF GROUP BY Q33A

GROUP		Q33A		
FREQUENCY	PERCENT			
ROW PCT	COL PCT	AGREE	DISAG	TOTAL
POS		12	2	14
		85.71	14.29	100.00
		85.71	14.29	
		100.00	100.00	
TOTAL		12	2	14
		85.71	14.29	100.00

TABLE FORTY-EIGHT- HYPOTHESIS ONE, POOLED DATA COMPANY B

TABLE OF GROUP BY Q26A

GROUP		Q26A		
POS	FREQUENCY	ADREE		TOTAL
	PERCENT			
	ROW PCT			
	COL PCT			
		23		23
		100.00		100.00
		100.00		100.00
		100.00		100.00
TOTAL		23		23
		100.00		100.00

TABLE OF GROUP BY Q33A

GROUP		Q33A		
POS	FREQUENCY	ADREE	DISAG	TOTAL
	PERCENT			
	ROW PCT			
	COL PCT			
		19	4	23
		82.61	17.39	100.00
		82.61	17.39	
		100.00	100.00	
TOTAL		19	4	23
		82.61	17.39	100.00

TABLE FORTY-NINE- HYPOTHESIS TWO, POOLED DATA COMPANY B

TABLE OF GROUP BY Q26A

GROUP		Q26A		
FREQ PERCENT ROW PCT COL PCT	AGREE	TOTAL		
NIG	21 95.45 100.00 95.45	21 95.45		
LOW	1 4.55 100.00 4.55	1 4.55		
TOTAL	22 100.00	22 100.00		

TABLE OF GROUP BY Q33A

GROUP		Q33A		
FREQ PERCENT ROW PCT COL PCT	AGREE	DISAG	TOTAL	
NIG	19 86.36 90.48 100.00	2 9.09 9.52 66.67	21 95.45	
LOW	0 0.00 0.00 0.00	1 4.55 100.00 33.33	1 4.55	
TOTAL	19 86.36	3 13.64	22 100.00	

STATISTICS FOR TABLE OF GROUP BY Q33A

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	1	6.635	0.010
LIKELIHOOD RATIO CHI-SQUARE	1	4.317	0.038
CONTINUITY ADJ. CHI-SQUARE	1	1.176	0.278
MANTEL-MAENZEL CHI-SQUARE	1	6.333	0.012
FISHER'S EXACT TEST (1-TAIL)			0.136
(2-TAIL)			0.136
PHI		0.549	
CONTINGENCY COEFFICIENT		0.481	
CRAMER'S V		0.549	

SAMPLE SIZE = 22

WARNING: 75% OF THE CELLS HAVE EXPECTED COUNTS LESS THAN 5. CHI-SQUARE MAY NOT BE A VALID TEST.

TABLE FIFTY- HYPOTHESIS THREE, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE 03 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	433.00	449.50	8.21
NEG	1	12.00	13.50	8.21

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 12.00 Z=0.3654 PROB >|Z|=0.7168
T-TEST APPROX. SIGNIFICANCE=0.7175
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI30= 0.16 DF= 1 PROB > CHI30=0.6699

ANALYSIS FOR VARIABLE 07 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	438.00	449.50	6.73
NEG	1	27.00	13.50	6.73

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 27.00 Z=1.6343 PROB >|Z|=0.1022
T-TEST APPROX. SIGNIFICANCE=0.1150
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI30= 2.92 DF= 1 PROB > CHI30=0.0879

ANALYSIS FOR VARIABLE 08 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	439.50	449.50	8.00
NEG	1	29.50	13.50	8.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 29.50 Z=1.1753 PROB >|Z|=0.2399
T-TEST APPROX. SIGNIFICANCE=0.2494
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI30= 1.33 DF= 1 PROB > CHI30=0.2160

ANALYSIS FOR VARIABLE 09 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	439.00	449.50	7.94
NEG	1	27.00	13.50	7.94

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 27.00 Z=1.4923 PROB >|Z|=0.1000
T-TEST APPROX. SIGNIFICANCE=0.1714
KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI30= 2.13 DF= 1 PROB > CHI30=0.1420

TABLE FIFTY- continued

ANALYSIS FOR VARIABLE Q10 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	444.50	449.50	0.04
NEG	1	18.50	15.50	0.06

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 0.3104$ $PROB > |Z| = 0.7563$

T-TEST APPROX. SIGNIFICANCE = 0.7505

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI^2 = 0.14$ $DF = 1$ $PROB > CHI^2 = 0.7096$

ANALYSIS FOR VARIABLE Q11 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	441.00	449.50	0.25
NEG	1	24.00	15.50	0.25

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 0.9698$ $PROB > |Z| = 0.3322$

T-TEST APPROX. SIGNIFICANCE = 0.3402

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI^2 = 1.06$ $DF = 1$ $PROB > CHI^2 = 0.3028$

ANALYSIS FOR VARIABLE Q14 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	439.50	449.50	7.43
NEG	1	25.50	15.50	7.43

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 1.2752$ $PROB > |Z| = 0.2022$

T-TEST APPROX. SIGNIFICANCE = 0.2124

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI^2 = 1.00$ $DF = 1$ $PROB > CHI^2 = 0.1799$

ANALYSIS FOR VARIABLE Q23 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	452.00	449.50	8.27
NEG	1	23.00	15.50	8.27

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 $Z = 0.0468$ $PROB > |Z| = 0.9976$

T-TEST APPROX. SIGNIFICANCE = 0.9045

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 $CHI^2 = 0.02$ $DF = 1$ $PROB > CHI^2 = 0.8647$

respect to questions 1, 2, 3, 6, 12, 13, 15, 16, 17, 19, 20, 21, and 32 using the Wilcoxon rank sum test (Table 51). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

The p values for questions 2 (.0966) and 17 (.0731), however, do indicate that some relationship exists. With respect to question 2, it appears that the individual who perceived a negative path also neither agreed nor disagreed that he could speak frankly with his supervisor. Additionally, the individual who perceived a negative path also indicated that he only agreed somewhat that his supervisor emphasized the quality of his work (Q 17) on the other hand the positive group generally agreed that the quality of work was a concern of their supervisor.

H_5 : Motivation of individuals who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to questions 29, 30, 31, 36, and 37 using the Wilcoxon rank sum test (Table 52). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

H_6 : Job facet perceptions of those who perceived a positive path and those who perceived a negative path.

TABLE FIFTY-ONE- HYPOTHESIS FOUR, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE Q6 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE Q16 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
POS	29	443.50	7.48	POS	29	440.50	8.32
NEG	1	19.50	7.48	NEG	1	4.50	8.32
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 19.50 Z= 0.4676 PROB > Z =0.6400				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 4.50 Z=-1.2616 PROB > Z =0.2070			
T-TEST APPROX. SIGNIFICANCE=0.4935				T-TEST APPROX. SIGNIFICANCE=0.2171			
BRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI20= 0.29 DF= 1 PROB > CHI20=0.5950				BRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI20= 0.29 DF= 1 PROB > CHI20=0.5950			
ANALYSIS FOR VARIABLE Q18 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE Q17 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
POS	29	440.00	8.04	POS	29	434.50	6.97
NEG	1	25.00	8.04	NEG	1	28.50	6.97
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 25.00 Z= 1.1193 PROB > Z =0.2650				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 28.50 Z= 1.7921 PROB > Z =0.0793			
T-TEST APPROX. SIGNIFICANCE=0.2722				T-TEST APPROX. SIGNIFICANCE=0.0834			
BRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI20= 1.48 DF= 1 PROB > CHI20=0.2374				BRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION) CHI20= 1.48 DF= 1 PROB > CHI20=0.2374			
ANALYSIS FOR VARIABLE Q19 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE Q19 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ	LEVEL	N	SUM OF SCORES	STD DEV UNDER HQ
POS	29	494.50	7.67	POS	29	494.50	7.67
NEG	1	8.50	7.67	NEG	1	8.50	7.67
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 8.50 Z=-0.8677 PROB > Z =0.3966				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S= 8.50 Z=-0.8677 PROB > Z =0.3966			
T-TEST APPROX. SIGNIFICANCE=0.4036				T-TEST APPROX. SIGNIFICANCE=0.4036			

TABLE FIFTY-ONE- continued

ANALYSIS FOR VARIABLE Q1 CLASSIFIED BY VARIABLE QMPP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	436.50	449.50	8.03
NEG	1	29.50	15.50	8.03

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S = 25.50 Z = 1.1829 PROB >|Z| = 0.2349

T-TEST APPROX. SIGNIFICANCE = 0.2445

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI SQ = 1.55 DF = 1 PROB > CHI SQ = 0.2131

ANALYSIS FOR VARIABLE Q2 CLASSIFIED BY VARIABLE QMPP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	436.00	449.50	7.82
NEG	1	29.00	15.50	7.82

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S = 29.00 Z = 1.4618 PROB >|Z| = 0.0946

T-TEST APPROX. SIGNIFICANCE = 0.1073

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHI SQ = 2.98 DF = 1 PROB > CHI SQ = 0.0844

ANALYSIS FOR VARIABLE Q3 CLASSIFIED BY VARIABLE QMPP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	438.00	449.50	8.17
NEG	1	27.00	15.50	8.17

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S = 27.00 Z = 1.3667 PROB >|Z| = 0.1781

T-TEST APPROX. SIGNIFICANCE = 0.1883

ANALYSIS FOR VARIABLE Q12 CLASSIFIED BY VARIABLE QMPP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	448.50	449.50	7.90
NEG	1	24.50	15.50	7.90

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S = 24.50 Z = 1.0759 PROB >|Z| = 0.2822

T-TEST APPROX. SIGNIFICANCE = 0.2910

ANALYSIS FOR VARIABLE Q13 CLASSIFIED BY VARIABLE QMPP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	448.50	449.50	7.78
NEG	1	24.50	15.50	7.78

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S = 24.50 Z = 1.0924 PROB >|Z| = 0.2747

T-TEST APPROX. SIGNIFICANCE = 0.2837

TABLE FIFTY-ONE- continued

ANALYSIS FOR VARIABLE Q20 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	29	442.50	449.50	7.67	15.26
NEG	1	22.50	19.50	7.67	22.50

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 22.50 Z= 0.8475 PROB >|Z|=0.3967

T-TEST APPROX. SIGNIFICANCE=0.4036

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.83 DF= 1 PROB > CHISQ=0.3614

ANALYSIS FOR VARIABLE Q21 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	29	458.00	449.50	7.71	15.79
NEG	1	7.00	19.50	7.71	7.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 7.00 Z=-1.0570 PROB >|Z|=0.2997

T-TEST APPROX. SIGNIFICANCE=0.3083

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 1.21 DF= 1 PROB > CHISQ=0.2706

ANALYSIS FOR VARIABLE Q32 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	29	448.00	449.50	7.42	15.45
NEG	1	17.00	15.50	7.42	17.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 17.00 Z= 0.1349 PROB >|Z|=0.8927

T-TEST APPROX. SIGNIFICANCE=0.8937

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.04 DF= 1 PROB > CHISQ=0.8397

The positive and negative groups were compared with respect to questions 34, 35, and 38-52 using the Wilcoxon rank sum test (Table 53). Employing .05 significance level H_0 could not be rejected with respect to any of the questions.

Questions 34 (p. 0725), 40 (p. .0616), 49 (.0631), and Q 51 (.0530) do, however, indicate that some relationship exists. The individual on the negative path indicated that he neither agreed nor disagreed that his salary and bonus depend on how well he performs (Q34), and that his salary and bonus were important (Q40) rather than very important to him. This individual also indicated that the quality of his job performance (Q49) and his work group's performance (Q51) is only somewhat important to determining his salary and bonus.

H7: Perceived pay-performance linkage by those who perceive a positive path and those who perceive a negative path.

The positive and negative groups were compared with respect to questions 27 and 28 using the Wilcoxon rank sum test (Table 54). Employing .05 significance level H_0 could not be rejected with respect to either of the questions.

Questions 27 (p. .0603) and 28 (p. .0813) do, however, indicate that there is some difference in perceived pay-

TABLE FIFTY-TWO- HYPOTHESIS FIVE, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE 029 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	443.00	449.50	7.62
NEG	1	22.00	15.50	7.62

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 22.00 Z = 0.7878 PROB >|Z| = 0.4300
T-TEST APPROX. SIGNIFICANCE = 0.4372

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ = 0.73 Df = 1 PROB > CHISQ = 0.3934

ANALYSIS FOR VARIABLE 030 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	424.50	449.50	7.07
NEG	1	10.50	15.50	7.07

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 10.50 Z = -0.3364 PROB >|Z| = 0.5245
T-TEST APPROX. SIGNIFICANCE = 0.5295

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ = 0.50 Df = 1 PROB > CHISQ = 0.4795

ANALYSIS FOR VARIABLE 031 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	443.00	449.50	7.43
NEG	1	22.00	15.50	7.43

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 22.00 Z = 0.8872 PROB >|Z| = 0.4199
T-TEST APPROX. SIGNIFICANCE = 0.4261

ANALYSIS FOR VARIABLE 036 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	444.00	449.50	7.52
NEG	1	21.00	15.50	7.52

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 21.00 Z = 0.6649 PROB >|Z| = 0.5063
T-TEST APPROX. SIGNIFICANCE = 0.5114

ANALYSIS FOR VARIABLE 037 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOBON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	437.00	449.50	7.74
NEG	1	26.00	15.50	7.74

MILCOBON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S² = 28.00 Z = -1.5593 PROB >|Z| = 0.1211
T-TEST APPROX. SIGNIFICANCE = 0.1319

TABLE FIFTY-THREE- HYPOTHESIS SIX, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE 034 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 039 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
POS	29	436.00	7.24	POS	29	452.50	7.43
NEG	1	29.00	7.24	NEG	1	12.50	7.43
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 29.00 Z = 1.7959 PROB > Z = 0.0729				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 12.50 Z = -0.3267 PROB > Z = 0.7439			
T-TEST APPROX. SIGNIFICANCE = 0.0029				T-TEST APPROX. SIGNIFICANCE = 0.7042			
ANALYSIS FOR VARIABLE 035 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
POS	29	436.50	7.68	POS	29	440.50	9.42
NEG	1	28.50	7.68	NEG	1	4.50	9.42
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 28.50 Z = 1.6439 PROB > Z = 0.1002				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 4.50 Z = -1.0493 PROB > Z = 0.0416			
T-TEST APPROX. SIGNIFICANCE = 0.1110				T-TEST APPROX. SIGNIFICANCE = 0.0717			
ANALYSIS FOR VARIABLE 038 CLASSIFIED BY VARIABLE GROUP				ANALYSIS FOR VARIABLE 001 CLASSIFIED BY VARIABLE GROUP			
AVERAGE SCORES WERE USED FOR TIES				AVERAGE SCORES WERE USED FOR TIES			
MILCOXON SCORES (RANK SUMS)				MILCOXON SCORES (RANK SUMS)			
LEVEL	N	SUM OF SCORES	STD DEV UNDER NO	LEVEL	N	SUM OF SCORES	STD DEV UNDER NO
POS	29	437.00	6.98	POS	29	448.50	3.74
NEG	1	8.00	6.98	NEG	1	16.50	3.74
MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 8.00 Z = -1.0034 PROB > Z = 0.3137				MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION) (WITH CONTINUITY CORRECTION OF .5) S ² = 16.50 Z = 0.1336 PROB > Z = 0.8930			
T-TEST APPROX. SIGNIFICANCE = 0.3240				T-TEST APPROX. SIGNIFICANCE = 0.8947			

TABLE FIFTY-THREE - continued

ANALYSIS FOR VARIABLE 042 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	494.30	449.50	6.42
NEG	1	8.50	15.50	6.42

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 8.50 Z=-0.7723 PROB >|Z|=0.4399

T-TEST APPROX. SIGNIFICANCE=0.4062

ANALYSIS FOR VARIABLE 043 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	433.00	449.50	6.13
NEG	1	12.00	15.50	6.13

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 12.00 Z=-0.3691 PROB >|Z|=0.7121

T-TEST APPROX. SIGNIFICANCE=0.7147

ANALYSIS FOR VARIABLE 044 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	459.50	449.50	6.36
NEG	1	5.50	15.50	6.36

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 5.50 Z=-1.1391 PROB >|Z|=0.2544

T-TEST APPROX. SIGNIFICANCE=0.2640

ANALYSIS FOR VARIABLE 045 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	454.00	449.50	6.13
NEG	1	11.00	15.50	6.13

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 11.00 Z=-0.4922 PROB >|Z|=0.6226

T-TEST APPROX. SIGNIFICANCE=0.6263

ANALYSIS FOR VARIABLE 046 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	461.50	449.50	7.00
NEG	1	5.50	15.50	7.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 5.50 Z=-1.4750 PROB >|Z|=0.1408

T-TEST APPROX. SIGNIFICANCE=0.1913

ANALYSIS FOR VARIABLE 047 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	460.00	449.50	7.94
NEG	1	5.00	15.50	7.94

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 5.00 Z=-1.2509 PROB >|Z|=0.2081

T-TEST APPROX. SIGNIFICANCE=0.2101

TABLE FIFTY-THREE- continued

ANALYSIS FOR VARIABLE 040 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	428.00	449.50	7.74
NEG	1	7.00	15.50	7.74

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z=-1.8333 PROB >|Z|=0.3016

T-TEST APPROX. SIGNIFICANCE=0.3099

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.21 DF= 1 PROB > CHISQ=0.2722

ANALYSIS FOR VARIABLE 049 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	404.00	449.50	7.53
NEG	1	1.00	15.50	7.53

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z=-1.8384 PROB >|Z|=0.0431

T-TEST APPROX. SIGNIFICANCE=0.0733

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 3.78 DF= 1 PROB > CHISQ=0.0543

ANALYSIS FOR VARIABLE 090 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	461.50	449.50	7.22
NEG	1	3.50	15.50	7.22

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z=-1.5932 PROB >|Z|=0.1111

T-TEST APPROX. SIGNIFICANCE=0.1220

ANALYSIS FOR VARIABLE 092 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	461.00	449.50	7.41
NEG	1	0.00	15.50	7.41

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z=-1.4839 PROB >|Z|=0.1378

T-TEST APPROX. SIGNIFICANCE=0.1486

ANALYSIS FOR VARIABLE 091 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0
POS	29	464.00	449.50	7.24
NEG	1	1.00	15.50	7.24

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 Z=-1.9349 PROB >|Z|=0.0530

T-TEST APPROX. SIGNIFICANCE=0.0620

performance linkage between positive and negative path individuals. The negative path individual indicated that he strongly disagreed that if he did better on his variances his salary and bonus would increase (Q27), and he disagreed that he could use his variances to improve performance and increase his salary and bonus (Q28).

H8: Perceived performance (self-reported) of managers who perceived a positive path and those who perceived a negative path.

The positive and negative groups were compared with respect to question 61 using the Wilcoxon rank sum test (Table 55). Employing .05 significance level H0 could not be rejected.

H9: The perceived performance of those managers who reported a strong pay-performance linkage and those who reported a weak pay-performance linkage.

First the respondents were grouped according to their pay-performance linkage based on questions 27 and 28. Those individuals whose responses totaled 7 or less were classified as the strong pay-performance group (SFP), those whose responses totaled 8 were dropped from this analysis,

TABLE FIFTY-FOUR- HYPOTHESIS SEVEN, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE Q27 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	29	435.00	449.50	7.45	15.00
NEG	1	30.00	15.50	7.45	30.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 30.00 Z= 1.8784 PROB >|Z|=0.0603

T-TEST APPROX. SIGNIFICANCE=0.0704

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 3.78 DF= 1 PROB > CHISQ=0.0517

ANALYSIS FOR VARIABLE Q28 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	29	436.00	449.50	7.46	15.03
NEG	1	29.00	15.50	7.46	29.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 29.00 Z= 1.7432 PROB >|Z|=0.0813

T-TEST APPROX. SIGNIFICANCE=0.0919

KRUSKAL-MALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 3.28 DF= 1 PROB > CHISQ=0.0703

TABLE FIFTY-FIVE- HYPOTHESIS EIGHT, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE Q61 CLASSIFIED BY VARIABLE GROUP
 AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
POS	28	428.00	428.00	7.57	15.29
NEG	1	7.00	15.00	7.57	7.00

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
 (WITH CONTINUITY CORRECTION OF .5)
 S= 7.00 Z=-0.9901 PROB >|Z|=0.3221

T-TEST APPROX. SIGNIFICANCE=0.3306

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
 CHISQ= 1.12 DF= 1 PROB > CHISQ=0.2909

and those whose responses totaled 9 or more were classified as the weak pay-performance group (WPP). Next these groups were compared with respect to questions 61 and 62 using the Wilcoxon rank sum test (Table 56). Employing .05 significance level H_0 could not be rejected with respect to either question.

A RCB design was run on questions 1-53 with managerial levels serving as treatments and blocking on departments the data was then analyzed with Duncan's Multiple Range Test (Table 57). Although the groups were significantly different across managerial levels the plant manager was most different from the departmental managers. The performance Rankings (Q62) were analyzed with the RCB design, with managerial levels serving as treatments and blocking on departments which indicated that the rankings were significantly different (.00300726) across managerial levels. Further analysis indicated that plant managers were different from division managers (.00197187) and from departmental managers (.0109033). Additionally, table 58 shows all the respondents and their answers to every question.

TABLE FIFTY-SIX- HYPOTHESIS NINE, POOLED DATA COMPANY B

ANALYSIS FOR VARIABLE 061 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	26	402.50	390.00	12.62	15.48
MPP	3	32.50	45.00	12.62	10.83

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 32.50 Z=-0.9510 PROB >|Z|=0.3416

T-TEST APPROX. SIGNIFICANCE=0.3497

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.98 DF= 1 PROB > CHISQ=0.3219

ANALYSIS FOR VARIABLE 06200 CLASSIFIED BY VARIABLE GROUP
AVERAGE SCORES WERE USED FOR TIES

MILCOXON SCORES (RANK SUMS)

LEVEL	N	SUM OF SCORES	EXPECTED UNDER H0	STD DEV UNDER H0	MEAN SCORE
SPP	27	416.50	410.50	13.59	15.43
MPP	3	48.50	46.50	13.59	16.17

MILCOXON 2-SAMPLE TEST (NORMAL APPROXIMATION)
(WITH CONTINUITY CORRECTION OF .5)
S= 48.50 Z= 0.1104 PROB >|Z|=0.9121

T-TEST APPROX. SIGNIFICANCE=0.9128

KRUSKAL-WALLIS TEST (CHI-SQUARE APPROXIMATION)
CHISQ= 0.82 DF= 1 PROB > CHISQ=0.8830

TABLE FIFTY-SEVEN- QUESTIONNAIRE RESPONSE COMPARISON, COMPANY B PLANT TWO

DEPENDENT VARIABLE, RESP	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
SOURCE							
MODEL	71	2946.78943596	41.50294977	26.89	0.0001	0.658963	57.2017
ERROR	988	1525.02641509	1.54354908		ROOT MSE		RESP MEAN
CORRECTED TOTAL	1059	4471.73584906			1.24259648		5.33962264

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
BLOCK	52	2814.93584906	55.07	0.0001	52	2814.93584906	55.07	0.0001
TREAT	19	131.77358491	6.49	0.0001	19	131.77358491	6.49	0.0001

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLS. DECO
ALPHA=0.05 DF=988 MSE=1.54355

NUMBER OF MEANS	CRITICAL RANGE	NUMBER OF MEANS	CRITICAL RANGE
12	0.57446	14	0.579821
15	0.577331	16	0.581997
17		18	0.585688
19		20	0.588899
20			0.590127
21			0.591386

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN	GROUPING	MEAN	N	TREAT
A	A	4.5208	55	16
A	A	3.8491	53	17
C	C	3.6226	53	2
C	C	3.6038	53	12
C	C	3.5283	53	8
C	C	3.5283	53	20
C	C	3.4906	53	11
C	C	3.3962	53	7
C	C	3.3208	53	9
C	C	3.2830	53	5
C	C	3.2642	53	1
C	C	3.2642	53	14
C	C	3.2075	53	19
C	C	3.2075	53	3
C	C	3.1989	53	16
C	C	3.1132	53	6
C	C	3.0377	53	15
C	C	3.0377	53	4
F	F	2.9811	53	10
F	F	2.5849	53	13

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