ARE PERFORMANCE RATINGS REVEALED TO PEERS?

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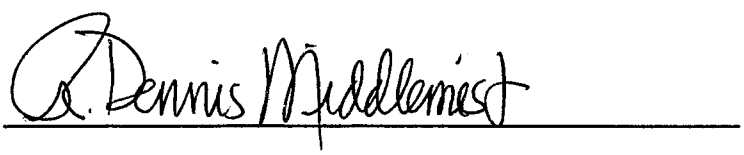
Scope and Method of Study: A formalized statistical, ex-post facto study was made to determine if performance ratings are revealed to peers. Confidential questionnaires were distributed to employees of Corporate Engineering at Phillips Petroleum Company at two locations. In the last few years, Corporate Engineering has become more open in revealing how their system of salary administration works. Engineers are now informed of their rating in private consultation with their supervisor. The purpose of this study is to determine whether any particular group of engineers is more likely to reveal performance ratings to peers.

Findings and Conclusions: The key question of the survey, did you reveal your performance rating to your peers, was answered yes on only 16% of the questionnaires. The first hypothesis is that ratings are revealed more by the younger Engineers. This was not supported by this study. The second hypothesis is that Registered Professional Engineers would be more likely to reveal rating information. This hypothesis was also not supported by this study. The third hypothesis is that there should be no difference in revealing tendencies between types of Engineers or sex. The data supported the hypothesis of no relationship between types of engineers. There were only 2 females that responded to the questionnaire. Because there are so few females, more testing would be required to accept the hypothesis.

ADVISOR'S APPROVAL 

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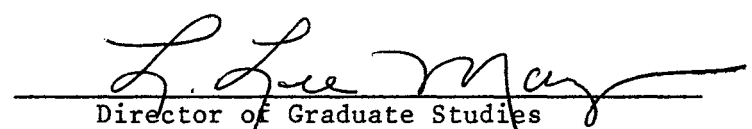

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Chapter I

Problem Statement

In the Corporate Engineering Division of Phillips Petroleum Company we use performance appraisals for two conflicting purposes, appraisal for reward purposes and appraisal for counseling purposes. On the one hand, an employee wants to look as good as possible in order to maximize his entrinsic rewards, while on the other he wants accurate and helpful feedback about his performance. For the basis of making raise and promotion decisions, all employees in a particular group are force rated superior, highly competent, proficient plus, proficient, or improvement required. The Human Resources Group forces each group to include certain percentages in each rating category to keep groups from rating all their people highly. Each employee's salary is compared to others in the same job grade to determine which quadrant their salary places them. These two pieces of information, rating and quadrant are then used to determine the percentage. Employees in the lower quadrants of the salary grade receive larger percentage raises than those in the upper quadrants with the same rating. Obviously higher ratings also lead to higher percentage raises. In the last few years, Corporate Engineering has become more open in revealing how this system of salary administration works. In fact, last year, most employees were shown the rating/quadrant matrix that determined their percentage raise. At that time, the employees saw how much variation was possible in their raise and the raises of others by the combination of quadrants and ratings. Therefore an increase in rating could be

translated into dollars for a particular employee who might then be more or less highly motivated.

Are Engineers, as professional employees, concerned about fairness or justice? As an employee in a work organization, one of the types of behavior engaged in is comparison with others in the organization. One comparison often made is your pay and your inputs to the organization with the same ratio of another relevant person. There are several theories such as dissonance theory, equity theory, social comparison theory, exchange theory, and expectancy theory that attempt to explain human behavior and distributive justice. Distributive justice has to do with the allocation of rewards and penalties according to merit. If you perceive that inequity exists, equity theory holds that you will be motivated to engage in behavior to reduce the inequity. With Corporate Engineering's more open salary administration policy, employees sharing information can make personal analysis of equity easier, without sharing actual salaries. The research question is whether performance ratings of Engineers are revealed to their peers.

From this study it is hoped to determine whether any particular group of Engineers is more likely to reveal performance ratings to peers. The results of this study may have some implications for the management of Corporate Engineering. A serious drawback to distributing information about raise percentages is the friction that seems to result from such disclosures. Though management may be prepared to defend its overall program, it often has difficulty justifying the legitimacy of minor differentials among employees.

This may be especially true in a forced ranking situation where there are very small differences between employees, but a dividing line drawn between two ratings may result in several percentage points difference in raises.

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Chapter II

Theory Discussion

Performance Appraisal

The process of performance appraisal is the continuous evaluation of the contribution of individuals and groups within the organization. Such evaluations are constantly being made for a variety of purposes, including selection, correction, training, pay increases, promotions, discipline, and transfers. Appraisals may vary from highly subjective, almost subconscious evaluations to highly systemized reviews focusing on specific behavior. Probably no other area of management is so fraught with anxiety on the part of both supervisors and subordinates and has so much potential for either positive or negative consequences in terms of morale, motivation, and development.

A large majority of industrial organizations use systematic performance appraisal procedures for both nonsupervisory and managerial employees. Nonindustrial organizations, including branches of the military services, government, hospitals, and universities, also make extensive use of such plans. Surveys typically indicate more use of formal performance appraisal procedures for midlevel managers, supervisors, and nonexempt white-collar employees than for blue-collar workers. The lesser incidence with blue-collar workers undoubtedly reflects the widespread practice of paying production and

maintenance workers straight hourly rates or using rate ranges through which they progress based on length of service. The most common interval between formal ratings as indicated in these studies was one year. The second most frequent interval was six months. While in a high proportion of firms appraisal results were discussed with the employee, most firms did not report feedback and discussion as a primary purpose of the appraisal.

There are numerous devices used in traditional performance appraisal. The graphic rating-scale method, also called the "chart method" is the most frequently used. With this method the rater places a check mark on a form next to the word or phrase describing the degree of merit for each of several traits such as quality of work, quantity of work, cooperation, and so forth. Degrees of merit might run from inadequate to superior, or below average to above average. A major problem with graphic rating scales is that words like superior, average, and the like mean different things to different people. The traits themselves such as loyalty and cooperation are also subject to different interpretations. Another device in performance appraisal is the rank-order method, in which a supervisor ranks all employees from best to poorest in one or more traits. If groups differ in size, statistical corrections need to be made to compare the relative standing of individuals in one group with that of individuals in another group. Another difficulty is that the distance in performance between two people tends to be obscured. Another rating technique is the forced-distribution method, in which the individuals rate are distributed along one or more scales and fixed percentages of employees are assigned to the best and worst ends of the scale

and to the middle bracket. This method is similar to the teaching technique of grading on the curve. Another device is the paired comparison method in which, for each trait to be considered, every subordinate is compared with every other subordinate. When the number of favorable choices is tallied for each individual, the method then reveals itself to be a detailed-ranking method. In this method, only two individuals are considered at one time, which presumably makes choice easier and more accurate. One difficulty is the number of comparisons increases geometrically as the size of the group to be rated increases. The critical-incident technique involves keeping a record of unusually good or undesirable incidents occurring in an employee's work and provides a factual record for subsequent discussions and decision making. One drawback in this method is the possibility that the supervisor may accumulate a number of bad incidents, unload them on subordinates at six-month or one-year intervals, and neglect to discuss them at the time of occurrence, when discussion would be the most meaningful. The forced-choice rating method features a series of descriptive statements in sets of four, with the rater choosing the most descriptive and least descriptive statements from each set. This method appears to minimize both the problem of the halo effect and the problem of different interpretation of the meaning of points on trait-scales. The halo effect, is the tendency for the rater to rate a person high on every trait if the person is outstanding in one particularly desirable characteristic and to rate the person low on all traits if there is some particularly conspicuous undesirable characteristic.

Both organizations and their employees have certain goals they wish to achieve

as a result of performance appraisal. In some cases such objectives are compatible, but in other situations they are in conflict. Organizations are increasingly becoming aware that they have to plan and program the development of their human resources just as they do their economic resources. Career development and assessment are the most frequent purposes for which appraisal is done. People have to be prepared to fill the many expected and unexpected job vacancies that are constantly occurring in organizations. Not having someone ready to fill in important job can be just as costly as not having the money to expand the organization's physical plant. Data from the performance evaluation system can help to pinpoint who might be good candidates for development and just what kind of development experiences might be best for them. The performance appraisal process is often used by organizations as a way of influencing intrinsic and extrinsic work motivation. The manner in which valued rewards are given has an important influence on motivation. The giving of such rewards as promotion and pay increases is often tied to the results of performance appraisal sessions in the hope of creating the belief that good performance leads to desired rewards.

Some performance appraisal sessions also include goal setting on the part of the subordinates, a process also designed to motivate behavior. Both the training and motivation functions of the performance appraisal process are important, but can conflict with each other. Appraisal for motivation tends to focus on the objective evaluation of the employee in relation to other employees. Appraisal for development tends to focus on strong and weak spots of performance from the point of view of how overall performance can be

improved and what the implications are for the employee's career. In addition to calling for different discussion emphasis, appraisal for reward purposes and appraisal for counseling purposes produce different, somewhat competing motivations in the individual who is being appraised.

The individual also has certain goals for the performance evaluation process. A number of social psychological theories have pointed out that individuals want to seek out feedback about their performance since it helps them learn more about themselves. If their performance compares favorably with others, then people tend to satisfy their needs for competence and psychological success; if it does not, they tend to experience failure, and the feedback is often difficult to accept. When the performance evaluation process is crucial in determining the extrinsic rewards an individual will receive, employees have a very direct reason for wanting to be favorably evaluated. The individual very naturally tries to present his performance in the best light in order to obtain the valued rewards that led him to join the organization in the first place. Thus, in the performance evaluation situation the individual often has conflicting objectives. On the one hand, he wants to look as good as possible in order to maximize his extrinsic rewards, while on the other he wants accurate and helpful feedback about his performance.

Although most rating systems involve superiors rating subordinates, and most people probably prefer this arrangement, peer ratings and subordinate ratings have been used with effectiveness in a few situations. The greatest use of the peer-rating technique seems to have occurred in research about military

organizations, although there has been some actual use of such ratings in assigning people to military combat teams, in selecting supervisors in industry, and in assisting supervisors to improve their performance. Ratings of supervisors by their subordinates have been used in industry to assist managers in improving their own performance. Students' ratings are also used in universities to assist professors in improving lectures and course content. Probably the major problem in the use of peer or subordinate ratings is the potential danger that the ratings may be made on the basis of performance that is useful to the rater but not necessarily to the enterprise. There is some evidence that subordinates prefer a different pattern of behavior from supervisors than is expected by the supervisor's superiors. Thus, management must be cautious of interpreting the results of peer and subordinate ratings and not abdicate decision making to subordinates. Distortion of true judgments are probably greatest when peer and subordinate ratings are used for decisions on pay increases and/or promotions, since these decisions can have an effect on the rater. For example, a person might rate a peer lower than warranted if one thought a higher rating might reduce one's own pay increase. However, there is also some evidence that peers may not distort peer ratings, at least when rating colleagues for possible promotion. In a study made in three insurance companies, agents were told that the results of peer ratings might be used administratively as one part of the overall process of assistant manager selection, yet the results were predictive of future managerial success in all three companies.

The work effectiveness of any individual can be evaluated from two

perspectives. It can be looked at in terms of the activities the person performs and the inputs he makes, and it can be looked at in terms of the results of that activity or the outcome it produces. Performance evaluation systems can and do focus on only results, only activities, or some combination of the two. The research evidence on performance evaluation suggests that focusing on results produces quite a different impact than focusing on activities or on a combination of the two. Focusing on either activities or results to the exclusion of the other produces undesirable consequences because it causes individuals to emphasize that which is measured to the exclusion of that which is not measured. For example, salesmen who are evaluated on the basis of sales results sometimes get their sales in ways that produce customer ill will and that lead to high costs. A system which focusses on results also often fails to provide the type of data which is needed to counsel and develop individuals. For this to be done effectively information is needed on why the person did or did not achieve the desired results. An appraisal approach which measures only the activities the person engages in and how they are engaged in obviously fails on a number of counts. It tends to motivate activities rather than accomplishment. For example, a system which measures salesmen only on how many calls they make and how polite they are is likely to motivate the salesmen to be very courteous and to make a high rate of calls, but it may not motivate them to sell. In some jobs it is difficult to measure results in a quantifiable, objective way. In some jobs it is difficult to measure activities, particularly from the point of view of how they are carried out. Inevitably the measurement systems which are used end up being subjective. However, this does not negate the point that both

results and activities need to be measured.

If performance appraisals are either too far apart or too close together, the feedback may be meaningless to the person, and the generation of invalid data may be encouraged. On any job it takes a certain amount of time for the impact of an individual's actions to show up in a measurable form. This fact has been utilized to develop a measure labeled "time span of discretion". It is defined as the time it takes for substandard performance to show up. In some jobs the time span is very short, perhaps only a few minutes, while in others it is several years. As might be expected, the time span of discretion tends to be much longer for higher-level management jobs than it is for lower-level jobs. Problems can develop when the time between performance evaluation sessions is either much longer or much shorter than is the time span of discretion. The feedback can be either premature and inaccurate or so slow that it is irrelevant.

Because both superiors and subordinates have ambivalent attitudes about performance appraisal, a phenomenon called the "vanishing performance appraisals" occurs in many organizations. When interviewed separately, subordinates report that they have not had a performance appraisal session for several years, while superiors report they hold regular performance appraisal sessions. Further investigation typically reveals that the superiors at some point in time have talked in rather general terms with the subordinates about their performance. The superiors consider this to be a performance appraisal session, but the subordinates do not and wonder why they are not getting the

kind of feedback they want. It is not hard to see how this kind of behavior on the part of the superiors can occur, given their mixed feelings about holding these sessions. It is also not hard to understand why what constitutes an acceptable appraisal session for an anxious superior might not provide the kind of information a subordinate wants.

Assuming the performance of groups to be relatively equal, one problem in appraising performance is the tendency of some supervisors to rate their people high and other supervisors to rate their particular subordinates low. One study of thirty department heads found that four of them rated their subordinates so severely that all were rated below the poorest rating made by the two most lenient department heads. Other studies have found some appraisers to be high differentiators, allocating subordinate ratings across most or all the range of scales, and some to be low differentiators, using a limited range of the scale in differentiating subordinates. This type of problem can be partially solved through training, forced distributions, or statistical corrections. It is possible for one group to be superior to others although the kind of discrepancies described above are not too likely. Because of such cases as differences in standards in original selection or differences in leadership or motivation, one group may be quite superior to another.

Another problem which can occur in the use of any personnel system is the distortions that can occur if the rules of administration require a particular course of action for a particular rating. Taking automatic action on the

basis of a rating without regard to its meaning or without regard to other important variables makes appraisal a monster rather than a useful tool. The Federal Civil Service discovered this effect soon after the Classification Act of 1923 required dismissal if a civil servant's rating fell below "good" on a scale of excellent, very good, good, fair, and unsatisfactory. As a consequence, it was rare for any agency to rate anyone below "good". Some of the deficiencies of the law were remedied in the Performance Rating Act of 1950, but ratings still resulted in automatic consequences. Since the law required a minimum of three levels - outstanding, satisfactory, and unsatisfactory - and required that all aspects of an employee's performance must be outstanding in order to receive an outstanding ranking and that discharge was mandatory in the case of an unsatisfactory ranking, 99 percent of the employees were rated satisfactory.

A particularly serious problem with rating techniques such as the rank-order, forced distribution, and paired comparison methods is that they create a kind of "zero-sum" climate in the organization. In this atmosphere, both managers and subordinates feel trapped in a world in which half of the people are below average and if one person rises to the above average category, it is at the expense of someone whose ranking must fall. Thus the net result is always zero. Such zero sum approaches frequently lead to widespread discouragement, cynicism, and alienation. Ways out of this dilemma are to focus on a goal or results approach, to use many kinds of feedback, and to avoid ranking kinds of comparisons.

No matter how well defined the dimensions for appraising performance on quantitative goals are, judgements on performance are usually subjective and impressionistic. Because appraisals provide inadequate information about the subtleties of performance, managers using them to compare employees for the purposes of determining salary increases often make arbitrary judgements. In some instances, an individual is informed of his superior's judgement. In others, performance appraisal results are withheld. Employees with more education, a stronger self-image, and a need to know about their effectiveness and their future will seek out information about themselves and their roles in the organization not only from their managers but from others in a position to observe, assess, and guide their behavior. An employee's peers will, in many cases, represent a credible source of feedback because of their frequent contacts and their interdependence among one another for accomplishing goals. Feedback from fellow team members will be critical in some caes, because peer pressure in a shared assignment can be a very powerful source.

Wage Administration

Once work effectiveness is evaluated, then it can be rewarded. This leads, in turn, to one of the most important features of work organizations, the power they have to give individuals extrinsic rewards. The rewards are allocated to individuals by organizations for many reasons and in different ways, often on the basis of the results of performance evaluations. In general, wage payments within the organization are determined by a flow of events including job analysis, writing of job descriptions, job specifications, job evaluation, surveys of wages and salaries, analysis of relevant organizational problems, structuring of wages, establishing rules for administering wages, and finally wage payments to individual employees. Decisions about the actual structure of wages and salaries are typically made after the relative worth of jobs has been decided (job evaluation), after prevailing wages and salary practices have been ascertained (surveys), and after relavant organizational problems have been considered. Several decisions must then be made, including (a) whether the organization wishes or is able to pay amounts above, below, or equal to the averages in the community or industry; (b) whether wage ranges should provide for merit increases or whether there should be single rates; (c) the number and width of pay grades and extent of overlap; (d) which jobs are to be placed in each of the pay grades; (e) the actual dollar amounts to be assigned to various pay grades; (f) differentials between pay plans; and (g) what to do with salaries that are out of line once these decisions have been made.

Numerous dimensions or problems must be considered in establishing the wage structure in addition to the results of job evaluation and wage surveys. For example, are there well established and well-accepted relationships among certain jobs that would be upset by job evaluation? Or is the lack of job evaluation perpetuating discrimination against women? Using the revised structure, will the organization be able to recruit new employees? Are there certain skills in such short supply that the prevailing rates in the community or industry are not consistent with the results of job evaluation? What if job evaluation shows that certain jobs are underpaid compared to others, but the labor market makes it relatively easy to recruit people into these jobs anyway? What pressures will be brought to bear on the employer if job evaluation results in certain jobs being paid significantly more than going community rates? What will happen to the wages of employees found to be overpaid through job evaluation? What should be the relationship between the wage structure and the fringe-benefit structure? These and other problems must be considered in establishing the wage structure of an organization.

Significant differences in salary between subordinates and superiors is common practice. One study reports typical differentials between rank-and-file jobs and supervisory jobs ranging from 15 to 25 percent. Appropriate differentials must be maintained between the exempt and nonexempt groups. Through lack of attention, inadequate differentials between this group and the nonexempt employees may develop, thus producing serious morale problems for the exempt employees. A particularly difficult problem arises when scientists or engineers work under the supervision of nonscientists. Competition in the

labor market has sometimes tended to force salaries of technical employees upward at a faster rate than managerial salaries in general, and drastic narrowing of differentials and sometimes reversals, have occurred in many companies. Because of the continuous rise in wage and salary levels experienced in this country, a rise resulting from a variety of environmental pressures, considerable thought must be given to handling upward changes in the wage and salary structure. Since most employees recognize the gradual upward movement of wage and salary levels, the wisest course seems to be to identify general adjustments clearly and not attempt to disguise them as merit increases.

Other uses of administration need to be developed in addition to rules pertaining to general adjustments, underpaid and overpaid employees, and differentials between subordinates and superiors. For example, it must be determined to what degree advancement will be based on length of service rather than merit, with what frequency pay increase will be awarded, how control over wage and salary costs can be maintained, and what rules will govern promotion from one pay grade to another. One of the difficulties in wage administration is the problem of relating merit, rating decisions to actual dollar increases. Although some companies have attempted to relate merit rating to pay increases on a mathematical basis, procedures allowing for more judgement about specific situations are probably wiser. Another problem arises from a change in wage and salary practices and structure that affects the relative wages of employees. What should be done about individual employees who appear to be overpaid or underpaid after such a change? Typical

practice is to avoid reducing any salaries but to withhold general adjustments or merit increases until the company's pay structure catches up with the employee's rate of pay through inflationary pressures on overall wage levels. In contrast, typical practice when employees are found to be underpaid after job evaluation is to bring their salaries quickly up to the appropriate rate.

Additional administrative rules are needed for handling promotions and demotions from one grade to another or from one pay plan to another. Since managers are tempted to exert pressure to obtain more money for persons who have reached the top of a pay range, partcularly long-service employees, control must be maintained to resist such pressures, or else, people are moved into higher pay brackets when there has been no genuine promotion. Such practices tend to subvent the meaning and usefulness of job evaluation, and salaries begin to reflect age or length of service instead of worth to the organization.

Many firms use a device called the maturity curve in salary administration programs pertaining to engineers and scientists, which either supplement or replaces job descriptions, job evaluations, and pay ranges. Its most widespread use is in making comparisons with other companies. This device is simply a graph that plots salaries against age or against years of relevant experience. No doubt the assumption that age and years of experience are correlated with contribution to the enterprise's goals has some validity, but the assumption is not always true, and it ignores other, more relevant variables, such as drive, intelligence, and judgement. Furthermore, the

assumption that performance tapers off and/or that compensation should peak or perhaps decline in a person's late forties or early fifties is open to serious question. In a study of 2,500 design and development engineers in six companies, on the average, performance ratings declined in their early thirties and salary increases dropped dramatically at about age thirty-seven.

An analysis of the relationship between satisfaction and performance in an organization can provide some important insights into the effectiveness of its reward system. A stong positive relationship between satisfaction and performance indicates a reward system that is functioning in a way that rewards good performance. On the other hand, a zero relationship or a negative one (the best performers are being least satisfied) can indicate that turnover in the organization is likely to be centered among the better performers rather than the poorer ones. A good strategy is to invest more in the good performers in order to hold them in the organization while minimizing the investment in the poorer performers. For example, giving essentially across-the-board raises does not mean that everyone will be equally satisfied with his raise. Quite to the contrary, it means that poor performers will be relatively better satisfied than the good performers. Poor performers tend to feel they deserve less in the way of rewards, and thus they react more favorably to a given pay raise than do good performers. There has been very little research on the effectiveness of deferred-compensation and pension plans, but it is reasonable to assume that they probably do lock many employees into organizations. In some organizations, this is even referred to as the golden padlock. The real question from the point of view of

organizational effectiveness, however, concerns who is locked in. They may retain only the less effective and less desirable employees. When one organization wants a good employee from another organization badly enough, it is willing to pay off or buy out any bonuses, retirement, or stock options that he might have built up in his current firm.

There are no magic formulas for converting differences in performance to differences in paychecks, and management must consider a variety of factors in making such judgements, including the company's ability to pay and labor-market competition. However, there are those who believe that differentials in salary among below average, average, and outstanding performers are generally inadequate. One author states that productivity of scientists and engineers in governmental research varies by a factor of nearly 100, but their compensation varies by a factor of only about 2½. That is, the scientist producing 100 times as much as the poorest performer might only make 2½ times the salary of the latter.

The extent to which employees are informed of the details of wage and salary programs varies with type of job, with companies, and with aspects of wage programs. Although most hourly paid workers are informed through the wage contract about the details of wage programs, salaried workers are more likely to have information about ranges than about specific salaries. One study of fifty-five companies found 95 percent of the firms giving general oral explanation of the salary program to the lower or middle-level exempt employees. Information conveyed included a statement that there was a job

evaluation program, that salaries reflected both the requirements of the job and the performance of the employee, that salary surveys were conducted periodically, and that individual performance was reviewed regularly. In 71 percent of the companies, the employee was informed of the maximum salary for her or his own position, but usually only upon request. In 85 percent of the companies, the employee was informed when at or near the maximum salary he or she could expect to earn on the particular job.

A serious drawback to distribution information about actual salaries paid to individuals is the friction that seems to result from such disclosures. Though management may be prepared to defend its overall program, it often has difficulty justifying the legitimacy of minor differentials among employees. Since people are likely to make judgements about their own performance compared to that of their peers and these judgements are likely to differ from those made by higher management, disagreement over relative ranking is bound to occur. Most managements minimize this problem by trying to maintain secrecy about salary data. Secrecy becomes a control assumed to reduce the time and effort management must spend in dealing with complaints. Paradoxically, although one sometimes hear managers complaining that "everyone knows what everyone else is making", there seems to be no research that has studied the extent of employee's knowledge about specific salaries. Some research, however suggests that secrecy about average salaries and ranges in the salaries of groups (not actual salaries) may create dissatisfaction rather than prevent it. It may also invalidate the potential motivating effects of disclosure. A survey of 563 middle and lower managers in seven organizations

found that managers tended 1) to underestimate the salaries of their superiors, 2) to overestimate the salaries of subordinate levels, and 3) to overestimate the salaries of their peers. Associated with these inaccuracies in perception was dissatisfaction about the differentials among themselves and both superiors and subordinates. Another study queried 575 professional employees in an organization and found that only about half were willing to have their salaries known to others. This held true by occupational group, by self-assessed performance level, and by age. There was some tendency for the more highly paid persons to prefer to have salaries kept confidential.

EQUITY

Some insight into the question of the role of pay as an influence on employee behavior and job performance is provided by equity theory. As an employee in a work organization, one of the types of behavior you engage in is comparing yourself with others in the organization. Equity, or more precisely, inequity, is a pervasive concern of industry, labor, and government. Yet its psychological basis is probably not fully understood. Evidence suggests that equity is not merely a matter of getting "a fair day's pay for a fair day's work," nor is inequity simply a matter of being underpaid. The fairness of an exchange between employee and employer is not usually perceived by the former purely and simply as an economic matter. There is an element of relative justice involved that supervenes economics and underlies perceptions of equity or inequity.

Whenever two individuals exchange anything, there is the possibility that one or both of them will feel that the exchange was inequitable. Such is frequently the case when a man exchanges his services for pay. On the man's side of the exchange are his education, intelligence, experience, training, skill, seniority, age, sex, ethnic background, social status, and, very importantly, the effort he expends on the job. Under special circumstances other attributes will be relevant: personal appearance or attractiveness, health, possession of an automobile, the characteristics of one's spouse, and so on. They are what he perceives are his contributions to the exchange, for

which he expects a just return. These inputs or investments are as perceived by their contributor and are not necessarily isomorphic with those of the other party to the exchange. This suggests two conceptually distinct characteristics of inputs, recognition and relevance. Problems of inequity arise only if the possessor of the attribute considers it relevant in the exchange. On the other side of the exchange are the rewards received by an individual for his services. These outcomes, as they will be termed, include pay, rewards intrinsic to the job, seniority benefits, fringe benefits, job status and status symbols, and a variety of formally and informally sanctioned prerequisites. An example of the latter is the right of higher status persons to park their cars in privileged locations, or the right to have a walnut rather than a metal desk. Seniority, mentioned as an input variable, has associated with it a number of benefits such as job security, "bumping" privileges, greater fringe benefits, and so on. These benefits are outcomes and are distinguished from the temporal aspects of seniority (that is, longevity), which are properly inputs. As in the case of job inputs, job outcomes are often intercorrelated. For example, greater pay and higher job status are likely to go hand in hand. In a manner analogous to inputs, outcomes are as perceived, and, again, we should characterize them in terms of recognition and relevance. If the recipient or both the recipient and giver of an outcome in an exchange recognize its existence, it has the potentially of being an outcome psychologically. In classifying some variables as inputs and others as outcomes, it is not implied that they are independent, except conceptually. Job inputs and outcomes are intercorrelated, but imperfectly so. It is because they are imperfectly correlated that we need at all be

concerned with job inequity. There exist normative expectations of what constitute "fair" correlations between inputs and outcomes. When the normative expectations of the person making social comparisons are violated, feelings of inequity result.

Before defining inequity, we introduce two references terms, Person and Other. Person is any individual for whom equity or inequity exists. Other is any individual or group used by Person as a referent when he makes social comparisons of his inputs and outcomes. Other is usually a different individual, but may be Person in another job, or even in another social role. Thus, for example, Other might be Person in the job he held 6 months earlier, in which case he might compare his present and past inputs and outcomes. Or Other might be Person in a future job to which he aspires. In such instance he would make a comparison of his present inputs and outcomes to his estimates of those in the future.

Using the theoretical model introduced by Festinger in 1957, inequity is defined as follows: Inequity exists for Person whenever his perceived job inputs and/or outcomes stand psychologically in an obverse relation to what he perceives are the inputs and/or outcomes of Other. The first point to note about the definition is that it is the perception by Person of his and Other's inputs and outcomes that must be dealt with, not necessarily the actual inputs and outcomes. The point is important, for, while perception and reality may be and often are in close accord, wage administrators are likely to assume an identity of the two. Second, if we let A designate Person's inputs and

outcomes and let B designate Other's, by "obverse relation" we mean that not A follows from B. But it is emphasized that the relation necessary for inequity to exist is psychological in character, not logical. Thirdly, is that inequity results for Person not only when he is relatively underpaid, but also when he is relatively overpaid. It is probable that the thresholds for inequity are different in cases of under- and overcompensation.

In discussing inequity, the focus has been exclusively on Person. In so doing, however, we have failed to consider that whenever inequity exists for Person, it will also exist for Other, provided their perceptions of inputs and outcomes are isomorphic or nearly so. Only when the perceptions or Person and Other do not agree, would the inequity be different for each.

Having defined inequity and specified its antecedents, we may next attend to its effects. First, two general postulates, closely following dissonance theory: (a) The presence of inequity in Person creates tension in him. The tension is proportional to the magnitude of inequity present. (b) The tension created in Person will drive him to reduce it. The strength of the drive is proportional to the tension created; it is proportional to the magnitude of inequity present. In short, the presence of inequity will motivate Person to achieve equity or reduce inequity, and the strength of motivation to do so will vary directly with the amount of inequity. The question, then, is how may Person reduce inequity? The following eight actions proposed by J. Stacy Adams enumerate and illustrate the means available to Person when reducing inequity.

1. Person may increase his inputs if they are low relative to Other's inputs and to his own outcomes. If, for example, Person's effort were low compared to Other's and to his own pay, he could reduce inequity by increasing his effort on the job. This might take the form of Person's increasing his productivity or enhancing the quality of his work. If inputs other than effort were involved, he could increase his training or education. Some inputs cannot be altered easily-sex and ethnicity, for instance. When such inputs are involved, other means of reducing inequity must be adopted.

2. Person may decrease his inputs if they are high relative to Other's inputs and to his own outcomes. If Person's effort were high compared to Other's and to his own pay, he might reduce his effort and productivity. One may speculate that restrictive production practices often observed are in fact attempts at reducing inequity. There exists in industry a tendency to select and hire personnel with education, intellect, and training which are often greater than that required by the job in which they are placed. Since it is likely that in many instances the comparison persons for these individuals will have lesser inputs and greater outcomes, it is evident that some of the newly hired will experience feelings of inequity. In consequence, education, intellect, and training not readily modified, lowered productivity may be predicted.

3. Person may increase his outcomes if they are low relative to Other's

outcomes and to his own inputs. When Person's pay is low compared to Other's and to his expended effort, he may reduce inequity by obtaining a wage increase. He could also acquire additional benefits, prequisites, or status.

4. Person may decrease his outcomes if they are high relative to Other's outcomes and to his own inputs. This might take the form of Person's lowering his pay. Though an improbable mode of reducing inequity, it is nevertheless theoretically possible. Although it is usually assumed that persons with very high personal incomes are motivated by tax laws to donate much to charitable and educational institutions, it is not improbable that this behavior on the part of some is motivated as well by feelings of inequity.

5. Persons may "leave the field" when he experiences inequity of any type. This may take the form of quitting his job or obtaining a transfer or reassignment, or of absenteeism. Leaving the field is perhaps a more radical means of coping with inequity, and its adoption will vary not only with the magnitude of inequity present, but also with Person's tolerance of inequity and his ability to cope with it flexibly. Though it has not been demonstrated, there are probably individual differences in tolerance and flexibility.

6. Person may phychologically distort his inputs and outcomes, increasing or decreasing them as required. Since most individuals are heavily

influenced by reality, distortion is generally difficult. It is pretty difficult to distort to oneself that one has a BA degree, that one has been an accountant for 7 years, and that one's salary is $500 per month, for example. However, it is possible to alter the utility of these. One can consider the fact that $500 per month will buy all of the essential things of life and quite a few luxuries, or conversely, that it will never permit one to purchase period furniture or a power cruiser.

7. Person may increase, decrease, or distort the inputs and outcomes of Others, or force Other to leave the field. Basically, these means are the same as discussed above, but applied to Other. The direction of change in inputs and outcomes would, however, be precisely opposite to changes effected in Person. Thus, for example, if Person's effort were too low compared to Other's and to his own pay, he might induce Other to decrease his effort instead of increasing his own effort. Or, if he were comparatively poorly qualified for his job, he might try to have his better qualified colleague fired or transferred.

8. Person may change his referent Other when inequity exists. If Person were a draftsman working harder, doing better quality work, and being paid less than Other at the next board, he might eschew further comparisons with Other and pick someone with more nearly the same capability and pay. The ease of doing this would vary considerably with the ubiquity of Other and with the availability of a substitute having some attributes in common with Person.

Not all the means of reducing inequity that have been listed will be equally satisfactory, and the adoption of some may result in very unsteady states. The nature of the input and outcome discrepancies and environmental circumstances may render some means more available than others, as may personality characteristics of Person and Other.

The majority of the research studies on equity theory have focused on pay levels as the basic outcome and effort or performance level as the primary input factor. In general, the underpayment situation has been supported in many of the reported studies. The overpayment situation, however has been less supported due to problems of trying to define or operationalize the exact meaning of overpayment. Other studies have shown that such demographic factors as sex and value systems have affected perceptions of equity. Research has also pointed out certain problems or criticisms of equity theory. First, in many of the reported studies the reference person has not always been classified. This is much less of a problem in laboratory experiments as opposed to field studies. In current studies, rather than specifying a reference person, the individual is allowed to use an internally derived standard of comparison (past experiences, beliefs, and opinions developed over time). This helps to alleviate not only the problem of who the reference person is, but also the situation of multiple reference persons for multiple outcomes. Second is the problem of an over-reliance on laboratory studies to test the theory. Issues of generalizations to real-life organizations and managers become important. The few field studies have been quite supportive

of inequity (under payment) as being a key predicator of turnover and absenteeism. Third, the majority of research generally supports the notions concerning underpayment, but supportive overpayment research has not been forthcoming. In reality, this probably is not too surprising, how many individuals in organizations will admit to being overpaid? If a person initially perceives an overpayment situation, the easiest way to reach equity is to change the reference standard or person. Finally, the theory has focused almost entirely on the outcome of pay. The general orientation of contemporary theories of motivation have shown that pay is not the only factor that motivates people.

The effects of age, sex, and perceived qualifications on one's performance behavior have all been examined in various studies in the equity research literature. An early study by Clark (1958) showed that job status should be in line with social status in a supermarket checkout ringer/bundler team or inefficiencies resulted. An experiment was designed by Adams and Rosenbaum (1962) in which one group of subjects was overcompensated and one was equitably compensated. The results showed that the overcompensated group completed 42% more work to attempt to reduce the inequity. A study by Day (1961) in a laboratory experiment with children who were given training trials in which they pushed a plunger mechanism to obtain M&M candies also obtained similiar results. After responses had stabilized, 25 M&Ms were received by each subject on each of five trials regardless of the pressure exerted. Day's data show that a significant number of subjects respond to the increased reward by increased pressure on the overrewarded trials. In terms of our

theoretical model, the children in Day's study are comparing their inputs (pressure) and outcomes (M&Ms) during the overrewarded trials with those during the training trials. In a study by Arrowood (1961), a similiar experiment to Adams and Rosenbaum's was used to eliminate the hypothesis that the overcompensated group worked harder to protect their jobs because they were insecure in the face of their employer's low regard for their qualifications. In another study by Adams and Rosenbaum (1962), overpaid hourly subjects produced more than their controls and overpaid piecework subjects produced less than their controls.

A study by Leventhal and Lane (1970) examines perceived qualifications and sex differences. College students worked with a fictitious partner on a task for which their dyad received monetary reward. Subjects were told their performance was either superior or inferior to that of their partner and were allowed to allocate the reward earned by their group. Males took more than half the reward when their performance was superior and less than half when their performance was inferior. Females took approximately half the reward when their performance was superior and much less than half when their performance was inferior. Females with superior performance also tended to minimize the difference between their own performance and that of their partner. These findings were contrasted with the results from a study of children aged 5½ to 6. The children never took less than half when they were inferior. The boys took more than the girls when they were superior. Therefore the reward allocation responses of subjects with superior performance were similar at both age levels, but those of subjects with

inferior performance were not. Vinacke and associates indicate that females allocate rewards differently than males. They found that females adopted an accommodative strategy in their transactions with members of their group. Females major concern appeared to be the maintenance of harmonius personal relationships in which the welfare of all members was protected. Thus, despite considerable differences in members' perceived power, members of all-female coalitions tended to divide a group prize equally. Male subjects, on the other hand, adopted a more exploitive strategy.

A decision-making simulation concerning a hypothetical subordinate was used by Freedman (1979) to investigate the effects of subordinate sex, pay equity, and strength of demand on compensation decisions in an organizational setting. Results indicated that subjects recommended higher raises for underpaid subordinates than for equitably paid subordinates. A triple interaction of all three variables was also found. When subordinates were equitably paid, sex and strength of demand had no effect on compensation decision. However, when subordinates were underpaid, strong demand females received the largest raise and females making no demand received the smallest. Underpaid males in both demand conditions received a raise less than that of the strong demand female, but greater than that of the no-demand female. A study by Taynor (1975) indicated that the performance of men and women are not always evaluated in the same manner. A woman who performed well in a masculine task (Engineering work might be considered as one such task) was seen as more deserving of reward than an equally performing man. Contrary to predictions, the man was not seen as more deserving of reward than the women in the

feminine task situations.

Ronen (1978) studied the relationship between job satisfaction and length of employment in a particular job. The hypothesis that the change in job satisfaction with job seniority resembles a "U" shaped curve was confirmed. It was suggested that intrinsic satisfaction is a major contributor to changes in the overall satisfaction of employees over time. Herzberg suggested a "U" shaped relationship between age and job satisfaction and between organizational tenure and job satisfaction. He reasoned that the "newness" of a job produces high morale in employees. After the first few years, however, due to uncertainty and lack of security, satisfaction drops sharply. It begins to climb again as the employee's expectations adapt to a more realistic evaluation of the level of rewards that can be attained. March and Simon (1958) suggest that workers perceive a decrease in the availability of job alternatives as they become older. A number of studies generally show an increase in the level of job satisfaction with age. A study by Saleh (1964) has shown, however, that the increase in stated job satisfaction does not continue until retirement, but rather that it decreases in the terminal period, for example the last five years before mandatory retirement. This could be explained by the blockage of channels for self actualization and psychological growth and was related to the decline in physical health. Any relationship found between job satisfaction and age, or organizational tenure, may not be directly due to the time variables, but rather to the employee's occupational level, as there is consistent evidence of a positive correlation between job satisfaction and job level (Porter-Lawler, 1968 and Vroom, 1964).

In a survey by Hunt and Paul (1975), of white collar workers, age and tenure had positive, linear relationships to overall job satisfaction. Age had a stronger relationship with satisfaction in males than tenure, the reverse held for females. When six facets of satisfaction were examined, the relationships with age and tenure became more complex. This research has highlighted the impracticality of attempting to develop a simple statement of the relationship between criteria of job satisfaction and employee age and tenure in an organization.

Equity theory provides at least three guidelines for managers to consider. First is the emphasis on equitable rewards for employees. When individuals believe that they are not being rewarded in an equitable fashion, certain morale and productivity problems may arise. Second, the decision concerning equity is not made solely on a personal basis but can involve comparison with other workers, both within and outside the organization. In other words, it is not only important how much an employee is being paid, but how much he or she is being paid compared to other employees who have the same or similar jobs. Finally, individual's reaction to inequity can take many different forms. Motivated behavior to reduce inequity can include changes in inputs and changes in outcomes, with the level or direction depending on whether the inequity was perceived to be underpayment or overpayment. Even with the inherent criticisms and limitations, equity theory has a certain intuitive appeal to managers.

Each of us has been in a situation in which he believed that the rewards for

our efforts had not been adequate, particularly when we compared ourseleves to others. Understanding the manner or process in which this inequity is reduced is an important skill for managers to develop.

ARE PERFORMANCE RATINGS REVEALED TO PEERS?

Chapter III

HYPOTHESES

The purpose of this study is to determine whether any particular group of Engineers is more likely to reveal performance ratings to peers. Are Engineers, as professional employees, concerned about equity? If inequity exists, equity theory holds that you will be motivated to engage in behavior to reduce the inequity. With Corporate Engineering's more open salary administration policy, employees sharing information can make personal analysis of equity easier, without sharing actual salaries. One author states that productivity of scientists and engineers in governmental research varies by a factor of nearly 100, but their compensation varies by a factor of only about 2½. That is, the scientist producing 100 times as much as the poorest performer might only make 2½ times the salary of the latter. From Stacy Adams' eight means available to reduce inequity, we see in item two that some newly hired individuals with high education, intellect, and training will experience feelings of inequity. From wage administration literature we find that there was some tendency for the more highly paid persons to prefer to have salaries kept confidential. In a study of 2,500 design and development engineers in six companies, on the average, performance ratings declined in their early thirties and salary increases dropped dramatically at about age thrity-seven. This leads to the first hypothesis; that ratings are revealed more by the younger Engineers to their peers than by the more experienced

Engineers. Young Engineers are very concerned about salaries and opportunities for advancement. They have high goals and often are very idealistic. With the shortage of Engineers a few years ago, the younger Engineers were highly recruited and know that their peers were also highly recruited. All of these factors cause the young Engineers to seek feedback about their performance. Young Engineers have little experience with the performance appraisal system, and therefore will seek out their peers for comparison. On the other hand, the experienced Engineers are more financially secure, more realistic about their future potential, and know what to expect from performance appraisals and salary administration. Experienced Engineers are more likely to have large wage differences among peers due to past evaluations and have less to gain by revealing their personal rating.

From performance appraisal literature we find that employees with more education, a stronger self-image, and a need to know about their effectiveness and their future will seek out information about themselves and their roles in the organization not only from their managers but from others in a position to observe, assess, and guide their behavior. An employee's peers will, in many cases, represent a credible source of feedback because of their frequent contacts and their interdependence among one another for accomplishing goals. The second hypothesis is that an Engineer that is a Registered Professional Engineer will be more likely to reveal rating information than an Engineer who is not registered. A Registered Professional Engineer is probably more concerned about career development than average or he would not have gone to the trouble to take the grueling test to become registered. The test also

discourages some less-confident Engineers from even trying to become registered. Often the Engineers that get registered are also the same ones who are taking additional course work after hours or already have an advanced degree. It follows that employees with more education, a stronger self-image, and a need to know about their effectiveness and future such as Registered Professional Engineers will seek out information about themselves not only from their managers, but from others in a position to observe, assess, and guide their behavior. A registered Professional Engineer will therefore be more likely to reveal rating information to help satisfy his need for equity.

From the literature review, there was found no reason to indicate the type of Engineer or the sex of the Engineer should be differentiated in equity. Therefore the third hypothesis is that sex or type of Engineer will show no relation with the revealing variable.

ARE PERFORMANCE RATINGS REVEALED TO PEERS?

Chapter IV

RESULTS AND ANALYSIS

Confidential questionnaires were distributed to 215 employees of Corporate Engineering at Phillips Petroleum Company in two locations, the Phillips Building, one of several downtown offices in the main complex in Bartlesville, Oklahoma, and at the Engineering Design Center, a separate building, west of downtown that houses exclusively the Design Division of Corporate Engineering. The Phillips building has the majority of the Chemical Engineers, while the Design Center has a mixture of Mechanical, Civil, Electrical, and other disciplines. A total of 164 questionnaires were returned (76%) with 156 having a B.S. degree in Engineering. The most common degree was Chemical with 66, followed by Mechanical-42, Electrical-21, Civil-17, and all others-10. Registered Professional Engineers accounted for 61% of the responses. Only two questionnaires were returned by females, still an extremely small minority of the Engineers in Corporate Engineering.

The key question of the survey was number 6; did you reveal your performance rating to your peers? Only 25 responses or 16% answered this question with a yes answer. The general feeling by management that the informal organization discusses this highly personal information seems to be unjustified. The purpose of this study is to determine whether any particular group of Engineers is more likely to reveal performance ratings to peers. Therefore,

the responses to the questionnaire of the total group will be compared to the responses of those who answered number 6 with a yes answer, revealer. Responses used satistically do not always total 156 because some answers were left blank, but the entire questionnaire was not discarded.

To test the hypothesis about question number 6, a nonparametric test of significance, the Chi Square Test, will be used. The Chi Square Test is the most widely used test for nominal data. The technique is of the goodness-of-fit type in which we test for significant differences between the observed distribution of data among categories and the expected distribution based on the null hypothesis. The null hypothesis in each case will be that the observed frequency will equal the expected frequency. The greater the difference between the observed and expected frequencies, the less the probability that these differences can be attributed to chance. The number of categories minus one equals the degrees of freedom, d.f. When d.f. = 1, each expected frequency should be at least 5 in size. If d.f. is greater than 1, then the Chi Square Test should not be used if more than 20 percent of the expected frequencies are smaller than 5, or when any expected frequency is less than 1. The level of significance alpha, selected for this study is 0.05, the most common level used in behavioral studies.

The majority of the responses to question 2 or 82% do compare their salary to published industry averages. The published data in usually presented by degree and by B.S. degree year and often is broken out in a number of categories such as region, sex, industry, and amount of supervision. The

sources are trade journals or technical societies, such as the American Institute of Chemical Engineers. It is no surprise that 96% of the revealers also compare their salaries to published industry averages. In general, it would appear that Engineers are interested in equity.

The most common answer was never, when asked in question 3 whether they compared actual dollar salaries with their peers before Corporate Engienering become more open in the workings of salary administration. A policy handbook from the Design Division of Corporate Engineering states: "NOTE: Company policy dictates that you are not to discuss your salary with anyone within Phillips Petroleum Company except designated management." In the following analysis, the remaining responses were lumped together, once, infrequently, often, always.

Question 3

	Revealers	Total	%	Expected
Never	9	107	.6903	16.57
Other	15	48	.3097	7.43
	24	155	1.0000	24

Calculated Chi Square = 11.17

d.f. = 1 alpha = 0.05

Critical Chi Square = 3.84

Reject Null Hypothesis

The alternative hypothesis, revealers are more likely to have discussed salaries, is supported (although it is by no means proved). It makes sense that those who discuss ratings are more likely to have discussed salaries and vice-versa. Concern about equity, probably does not appear suddenly.

During the time period that Corporate Engineering was becoming more open in revealing how the system of salary administration works, 93% of the respondents did not compare actual salaries to their peer's.

Question 4

	Revealers	Total	%	Expected
Yes	8	11	.0714	1.71
No	16	143	.9286	22.29
	24	154	1.000	24

Calculated Chi Square = 24.91

d.f. = 1 alpha = 0.05

Critical Chi Square = 3.84

Reject Null Hypothesis

The alternative hypothesis, revealers are more likely to have discussed salaries, is supported. Obviously, the expected frequency to discuss salaries is less than five and another statistical test would be more appropriate, but the fact remains that only 3 Engineers discussed salaries and did not also discuss ratings.

Only 92% of the respondents to question 5 knew their performance rating for the previous year. This might be a disappointment for management since Corporate Engineering supervisors were required to have their subordinates sign their performance rating sheet for the first time. This was another feature of the more open policy. All revealers answered yes to this question. You have to know your rating before you can reveal it to your peers. The 8% who did not know their rating may have transferred to Corporate Engineering from some other group or just plain forgot it.

Some insight about the respondent's perception of equity can be seen from question 7. After discussing salaries or ratings, 5 engineers felt better, 2 engineers felt worse, and 19 felt no change. Therefore, the majority probably felt no different about equity. There may be more equity perceived than inequity in the rating and salary administration since so few felt worse.

The work positions of supervisor and technical ladder are generally engineers with more experience. Therefore, a corallary to hypothesis one might be that supervisor and technical ladder engineers would be less likely to reveal their ratings.

Question 8

	Revealers	Total	%	Expected
Supervisors and TPL	3	44	.2821	7.05
Rank and File	22	112	.7179	17.95
	25	156	1.0000	25

Calculated Chi Square = 3.24

d.f. = 1 alpha = 0.05

Critical Chi Square = 3.84

Accept Null Hypothesis

At a signficance level of 0.05, the null hypothesis should be accepted, that there is no relationship. As can be seen, the calculated value is almost acceptable, and at an alpha level of 0.10, the critical Chi Square value is 2.71.

The first hypothesis; that ratings are revealed more by the younger Engineer than by the more experienced Engineers in the reasons for requesting information on length of time since the B.S. degree in question 9. Hiring of Engineers has not followed a smooth curve at Phillips. Economic conditions have dictated few young engineers being hired in the last several years. There are several periods like this in the company history, followed by the hiring of large numbers. This results in age and experience gaps in the company's engineering resource.

Question 9

	Revealers	Total	%	Expected
0-10	13	58	.3742	9.35
10+	12	97	.6258	15.65
	25	155	1.000	25

Calculated Chi Square = 2.28

d.f. = 1 alpha = 0.05

Critical Chi Square = 3.84

Accept Null Hypothesis

A Chi Square analysis was also calculated for all 5 age categories on the questionnaire. Again it was concluded that we have failed to reject the null hypothesis. The first hypothesis was not supported.

The second hypothesis, that a Registered Professional Engineer would be more likely to reveal rating informatin is the reason for asking question 10. Registration is not required at Phillips and only a few managers encourage it, although the Company does reimburse Engineers for the registration fees.

Question 10

	Revealers	Total	%	Expected
PE - Yes	14	95	.6090	15.22
PE - No	11	61	.3910	9.78
	25	156	1.000	25

Calculated Chi Square = 0.25

d.f. = 1 alpha = 0.05

Critical Chi Square = 3.84

Accept Null Hypothesis

It appears there is no relationship between being a Registered Professional Engineer and revealing your rating to peers. The second hypothesis was not supported.

The third hypothesis indicates there should be no difference in revealing tendencies between types of Engineers. The majority of Engineers answering the questionnaire and also employed by Phillips Petroleum Company are Chemical Engineers and Mechanical Engineers. For this analysis, all other types of Engineers were grouped together.

Question 1

	Revealers	Total	%	Expected
Chemical	7	66	.4231	10.58
Mechanical	8	42	.2692	6.73
Others	10	48	.3077	7.69
	25	156	1.000	25

Calculated Chi Square = 2.14

d.f. = 1 alpha = 0.05

Critical Chi Square = 5.99

Accept Null Hypothesis

There appears to be no significant relationship between types of Engineers and tendency to reveal ratings to peers. The third hypothesis also stated that sex of the Engineers should show no relationship with the revealing variable. From question 11, there were only 2 females that responded, both were revealers in that they answered question number 6 with a yes answer. Because there are so few females, we could conclude that this is not a significant variable, but more testing would be required for a definite conclusion.

Another variable in the questionnaires was the two locations that Corporate Engineering uses for employees in Bartlesville. The return address of the questionnaire was hand coded in two colors to indicate the source of the response. This was done more in the interest of response percentage, but as the data was analyzed, it appeard that one location had more revealers than the other.

Location

	Revealers	Total	%	Expected
Downtown	5	73	.4679	11.70
Design Center	20	83	.5321	13.30
	.25	156	1.000	25

Calculated Chi Square = 7.21

d.f. = 1 alpha = 0.05

Critical Chi Square = 3.84

Reject Null Hypothesis

The alternative hypothesis is supported, that Engineers at the Engineering Design Center are more likely to reveal their rating to peers. This does not support or reject any of the hypothesis. Some situational variable must be evidenced. One possible explanation is the isolation of the Design Center from the main downtown complex. Another explanation is that the Design Center employes almost as many technicians as engineers in the form of draftsmen and

engineering technicians, while the downtown engineers are not exposed to very many technicians. In any case, additional study would be required to explain this finding.

ARE PERFORMANCE RATINGS REVEALED TO PEERS?

Chapter V

SUMMARY AND CONCLUSIONS

Confidential questionnaires were distributed to 215 employees of Corporate Engineering at Phillips Petroleum Company at two locations. A total of 164 questionnaires were returned (76%) with 156 having a B.S. degree in Engineering. The key question of the survey was number 6, did you reveal your performance rating to your peers? Only 25 responses or 16% answered this question with a yes answer, revealers. The purpose of this study is to determine whether any particular group of engineers is more likely to reveal performance ratings to peers.

The majority of the responses or 82% to compare their salary to published industry averages. Also comparing their salaries to published industry averages are 96% of the revealers. It would appear that Engineers are interested in equity, but this is not a good predictor of revealers.

When asked whether they compared actual dollar salaries with their peers before Corporate Engineering became more open in the workings of salary administration, the most common answer was never. In a Chi Square analysis, the null hypothesis was rejected. The alternative hypothesis, revealers are more likely to have discussed salaries, is supported.

During the time period that Corporate Engineering was becoming more open in revealing how the system of salary administration works, 93% of the respondents did not compare actual salaries to their peer's. In a Chi Square analysis, the null hypothesis was rejected. The alternative hypothesis, revealers are more likely to discuss salaries, is again supported. Only 3 engineers discussed salareis and did not discuss ratings.

Only 92% of the respondents knew their performance rating for the previous year. This is somewhat disappointing since supervisors were required to have their subordinates sign their performance rating sheet in acknowledgement for the first time in Corporate Engineering. All revealers answered yes to this question, since they had to know it before they could reveal it.

Some insight about the respondent's perception of equity can be seen from the question about feeling better or worse after revealing. After discussing salaries or ratings, 5 engineers felt better, 2 engineers felt worse, and 19 felt no change. There may be more equity perceived than inequity in the rating and salary administration since so few felt worse.

The work positions of supervisor and technical ladder are generally engineers with more experience. Therefore, a corallary to hypothesis one might be that supervisors and technical ladder engineers would be less likely to reveal their ratings. In a Chi Square analysis, the null hypotheses was accepted, and the corallary was rejected.

The first hypothesis is that ratings are revealed more by the younger engineers than by the more experienced engineers. A Chi Square analysis failed to reject the null hypothesis and the first hypothesis was not supported.

The second hypothesis is that a Registered Professional Engineer would be more likely to reveal rating information. The second hypothesis was not supported by a Chi Square analysis.

The third hypothesis is that there should be no difference in revealing tendencies between types of engineer or sex. A Chi Square analysis supported the hypothesis that there is no relationship between types of engineers and the tendency to reveal. There were only 2 females that responded to the questionnaire, both revealers. Because there are so few females, more testing would be required for a definite conclusion.

Another variable in the study was the two locations that the questionnaire was distributed. A Chi Square analysis rejected the null hypothesis. The alternative hypothesis is supported, that engineers at the Engineering Design Center are more likely to reveal their ratings to peers. Additional study would be required to explain this finding.

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APPENDIX

Data Summary

			Total	Revealers
Questionnaires			164	
1.	B.S. Degree		156	25
	Chemical		66	7
	Mechanical		42	8
	Civil		17	4
	Electrical		21	6
	Industrial		3	0
	Architectural		2	0
	Other		5	0
2.	Published Data	Yes	126	23
		No	28	1
3.	Before: Actual $	Never	107	9
		Once	12	2
		Infrequently	29	9
		Other	5	2
		Always	2	2
4.	Actual $ 1983	Yes	11	8
		No	143	16
5.	Know Rating	Yes	143	25
		No	13	0
6.	Reveal Rating	Yes	25	25

		No	131	0
7.	Feelings	Better	5	5
		No Charge	19	17
		Worse	2	2
8.	Work Position	Supervisor	28	1
		Technical Ladder	16	2
		Rank and File	112	22
9.	Years	0-5	19	4
		5-10	39	9
		10-20	23	4
		20-30	28	4
		30+	46	4
10.	Professional Engineer	Yes	95	14
		No	61	11
11.	Male		154	23
	Female		2	2

Questionnaire

I am conducting a survey about salary administration and performance appraisals for an MBA research report. Corporate Engineering supervisors rate their subordinates under such categories as superior, highly competent, proficient plus, proficient, or improvement required. These rating categories are part of the forced rankings used in salary administration. In the last few years, Corporate Engineering has become more open in revealing how this system of salary administration works. From this study, it is hoped to determine whether performance ratings are revealed by Engineers to their peers. In this case, peers are other Engineers of approximately equal standing and experience. Your replies will be treated in strict confidence and any publication will use only statistical totals. Please circle your responses.

1. Do you have a B.S. degree in Engineering (possibly among other degrees)?
   Yes No

   A. If so, what is your B.S. degree in? Aeronautical Architectural Chemical Civil Electrical Environmental Industrial Mechanical Petroleum Structural Other

   B. If not, do not complete the remainder of this questionnaire.

2. Do you compare your salary to published industry averages? Yes No

3. Before Corporate Engineering became more open in the workings of salary administration, did you compare actual dollar salaries with your peers?

   Never Once Infrequently Often Always

4. Did you compare your salary to your peer's salary during 1983? Yes No

5. Do you know your performance rating for 1982 which was actually rated in 1983? Yes No

6. Did you reveal your performance rating for 1982 (rated in 1983) to your peers? Yes No

7. If you did reveal you performance rating and/or salary with one or more of your peers during 1983, did you feel better or worse about your performance rating or salary?

   Better No Change Worse

8. What is your present work position? Supervisor Technical Ladder Rank and File Engineer

9. How many years since your B.S. degree in Engineering? 0-5 5-10 10-20 20-30 30+

10. Are you a Registered Professional Engineer (PE)? Yes NO

11. Sex? Male Female

When completed, please return your unsigned questionnaire to Jeff Bone at 10 C1 PB.

Thank You

VITA

Jeffrey Bone

Candidate for the Degree of

Master of Business Administration

Report: ARE PERFORMANCE RATINGS REVEALED TO PEERS?

Major Field: Business Administration

Biographical:

Personal Data:

Born in Kansas City, Missouri, June 30, 1954, the son of Bert and Loretta Bone.

Education:

Graduated from Shawnee Mission North High School, Shawnee Mission, Kansas, May, 1972; received the Bachelor of Science degree with honors Kansas State University with a major in Chemical Engineering, May, 1976; studied Business Administration at West Texas State University; completed requirements for the Master of Business Administration degree at Oklahoma State University, May, 1984.

Professional Experience:

All with Phillips Petroleum Company. Yardman laborer in lube oil compounding plant in Kansas City, Kansas, summer 1975. Responsible for optimization and daily performance checks on crude units, catalytic reformers, and hydrodesulfurization units at Borger, Texas Refinery, 1976 thru 1978. Process group of Corporate Engineering in Gas Processing International group, in Bartlesville, Oklahoma, 1978 thru 1979. Final process checkout of North Sea Oil and Gas Production Platform in Stavanger, Norway, 1979. Process group of Corporate Engineering in Bartlesville, Oklahoma, 1980 thru 1984, handling refinery projects, chemicals projects, resident Process Engineer in Contractor's offices in New York, Los Angeles, and Houston, and now specializing in the manufacture of Ethylene. Became a Registered Professional Engineer in the State of Oklahoma in 1981.

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