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WORK PERFORMANCE: A NEW APPROACH TO EXPECTANCY THEORY PREDICTIONS

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

Research was conducted to develop and test a model of performance based upon a reconceptualization of Vroom's (1964) expectancy model. The reconceptualized model assumes that an individual chooses from among levels of performance rather than, as proposed by Vroom, from among levels of effort to exert.

A questionnaire was administered to each of 56 individuals employed as proof machine operators in one department of a large bank operation. The

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questionnaire was designed to estimate components of the new model such as the probability that the individual will be able to work at particular performance levels, the value of specific work outcomes, and the probability that performance at each of the performance levels will lead to the various work outcomes. These estimates were used to generate the model's prediction of the individual's observed performance as measured by the proportion of time that the individual actually performed at a given level. Strong support was found for the reconceptualized model. The model was able to account for the objective measure of performance to a much greater extent than had typically been found in the use of the traditional expectancy model.

Theoretical implications are given as to the conditions under which an expectancy model based upon choice among performance is useful. Practical implications of the reconceptualized model are given in a discussion of potential managerial control and monitoring of productivity.

FOREWORD

This research and development was performed under Work Unit 55.521.018.03.02, Organizational Structure and Environment, initiated to explore the development of techniques to increase organizational productivity. The primary purpose of the exploratory development presented here is to determine the relationship between employee motivation and work performance. It is anticipated that a better understanding of this relationship will eventually make it possible for the management of an organization to evaluate proposed policy changes with respect to their expected impact upon productivity.

This initial application of a modified theory was not constrained by requirements that data be collected in a Navy setting. Inasmuch as considerations of national security were not limiting, this Center was able to take advantage of a situation in an active local organization to obtain applicable data. Because it would be less costly and of lower risk, this study was conducted on a modest scale within a small organization. The results were encouraging enough to provide the confidence to conduct an evaluation of the model in a larger scale investigation. This evaluation is presently being done by this Center at the Long Beach Naval Shipyard.

Gratitude is expressed to Paul Gonya and the members of Dataminder Corporation who participated in this study. Much appreciation is given to the following individuals who assisted in the gathering and the analysis of data, and who made numerous helpful suggestions: Dr. E. Chandler Shumate, Dr. Steve Dockstader, Mr. Ross Vickers, Mr. Jeffrey Haire, and Mr. Tom Trent.

J. J. CLARKIN
Commanding Officer

SUMMARY

Problem

The need exists to understand the relationship between organizational variables and work productivity of individuals within the organization. To the extent that an employee's performance is a function of his/her work motivation, an organization is capable of affecting work productivity by influencing employee motivation. Currently, the dominant approach to the study of employee motivation and performance is that of expectancy theory. Despite its wide usage, expectancy theory has not been as successful in accounting for objective measures of performance as originally hoped.

Purpose

The present study attempts to respond to the severe and basic criticism aimed at expectancy theory in light of its predictive failures. A reconceptualized model of expectancy theory is proposed in which the individual is assumed to make choices among levels of performance instead of effort levels as previously assumed. The study reported here presents the development and an empirical evaluation of the proposed model.

Approach

Fifty-six production workers were each administered a questionnaire which was designed to estimate the various components of the reconceptualized model. These were (1) the probability that the subject will be able to work at particular performance levels, (2) the probability that performance at each of the performance levels will lead to the various outcomes, and (3) the value of specific work outcomes. Using the information thus gathered in the reconceptualized model, the force to perform at each of seven performance levels was computed for each of 51 workers whose data were retained in the investigation. The force for each alternative performance level was correlated with the numbers of hours worked at each level by each subject. The latter was obtained from actual performance records which were available for each subject. In addition to the within-subject analysis, between-subject analyses were conducted to obtain information about the association of performance predicted for an individual and the individual's actual average performance.

Results and Conclusions

The results of the within-subject analysis showed a strong relationship between force to perform at each level and the actual hours spent working at those levels. Predictions based upon a multiplicative combination of expectancy (taken as an estimate of ability to perform at each level) and valence of performance were significantly better than predications based upon expectancy or valence separately.

Between-subject analyses indicate that differences in the relative performance of individuals were determined by differences in their ability, or expectancy to be able to perform at various levels. However, in order to account for absolute level of performance, both valence of performance and expectancy must be considered in a multiplicative combination as in the reconceptualized expectancy model.

The new model is most appropriately used to describe the performance of individuals working in organizations in which management focuses upon performance rather than effort. To the extent that the model is appropriate, it is possible for management to project the impact of specific personnel policy changes on performance, thus enabling better cost/benefit estimates of proposed changes.

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INTRODUCTION

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During the last decade, a great deal of organizational research has been devoted to the study of work motivation and to models of job effort and performance (e.g., Vroom, 1964; Porter & Lawler, 1968; Mitchell & Biglan, 1971; Heneman & Schwab, 1972; Mitchell, 1974). Currently, expectancy theory is dominating the work motivation literature. However, it has been suggested recently that expectancy theory and the work motivation research in general are at a crossroad. That is, if stronger results are not obtained, expectancy theory will likely be discarded and replaced by some new paradigm (Mitchell, 1974; Reinharth & Wahba, 1975).

As should be expected, the continued interest in any theoretical approach is dependent upon the strength of empirical evidence. Consequently, more rapid progress in expectancy theory is necessary to maintain interest in it.

While development has been slow, it is probably premature to abandon expectancy theory as an approach to work motivation. Mitchell (1974) has suggested that, before expectancy theory is abandoned, we should redirect our efforts to the development of a methodology which allows its value or lack of it to be more clearly demonstrated.

Purpose

With this in mind, the purpose of this study is to examine some reasons for the limited support for the theory, to suggest specific improvements, and, finally, to empirically test these improvements. A lengthy review of expectancy theory models will not be attempted here, as comprehensive reviews may be found elsewhere (Mitchell & Biglan, 1971; Heneman & Schwab, 1972; Mitchell, 1974). However, an understanding of these reviews, as well as other critiques (Behling & Starke, 1973; Schmidt, 1973), has been instrumental in the development of the improvements suggested here.

Background and Scope

While there are a large number of important criticisms of expectancy theory, space and prudence permit us to consider and test only a few. Those considered fall into two general categories, conceptual and methodological. In addition, attention is limited to those models associated with job performance. Questions associated with job satisfaction and occupational choice will not be addressed.

Conceptual Issues

Vroom (1964) proposed that the force (F) to engage in a particular act or to have a preference for an object or thing is a monotonically increasing function of the algebraic sum of the products of the expectancies (E) and valences (V). He also states that, when choosing between alternative acts, people will most frequently select the act with the largest force.

He further proposes that this force model can be used to predict a wide variety of acts or attitudes, including occupational choice, job satisfaction, job effort, and, when combined with ability, job performance. While very few changes have been proposed to Vroom's formulation of occupational choice and job satisfaction, a number of different variations of his job effort and performance model can be found (Porter & Lawler, 1968; Graen, 1969; Campbell, Dunnette, Lawler, & Weick, 1970). These variations are probably, in part, a consequence of the complexity of job performance as well as Vroom's treatment of the problem.

In predicting job performance, Vroom (1964, p. 203) proposes that performance is a multiplicative function of ability and motivation. While he spends a considerable amount of time defining ability and its many facets, he does not clearly specify what is meant by motivation in this context. However, at an earlier point (p. 194), Vroom clearly describes that motivation as the force to choose high effort over low effort. In the context of predicting performance as (ability) x (motivation), this seems to be a reasonable assumption. For example, if a person puts forth a high degree of effort and has high ability, he should be a high performer. Conversely, if an individual puts forth a great deal of effort but has no real ability, he should be a very low performer. As a consequence, most tests of Vroom's model have attempted to account for choices among levels of effort. Even though there is value in understanding the factors which determine individual expenditure of effort, defining motivation as the force to choose high effort creates two important conceptual problems, neither of which have been clearly recognized.

These problems are the result of (1) the assumption that individuals actually make their primary work behavior choices in terms of effort and (2) a confounding of Vroom's Motivation term with ability. Both of these problems are discussed in detail below.

By defining motivation as the force to choose high effort over low effort, it is necessary to assume that individuals in work settings actually do choose between effort levels as the principal means to obtain organizationally, socially, and personally administered rewards and punishments. In order to accept such an assumption, it would be necessary for effort to directly result in valued outcomes.

It is unrealistic for an individual to make choices between all possible alternatives, therefore he must restrict his choices to a subset of alternatives which are most salient. For example, if an individual is faced with choosing between alternative levels of performance and alternative levels of effort simultaneously, the task becomes extremely difficult. This is analogous to an attempt to select among multiattribute alternatives (e.g., Shepard, 1964). Because of this difficulty, attention is usually focused upon one dimension and initial choices made according to that dimension. The dimension most likely to receive attention is the one most directly associated with valued outcomes. Therefore, one should expect that choices will be among the alternatives which are, to a large extent, the activities attended to by the organization (Blau, 1955; Berliner, 1961) and for which an individual derives his important outcomes. For example, if the organizational rewards valued by an individual are determined by the number of units produced, then behavioral choices are likely to be between alternative production rates. On the other hand, if the organization focuses attention on the discretionary hours worked, choices will respond to that factor. While some organizations may not be able to measure and reward performance very effectively, most attempt to measure it and focus a great deal of attention on it (in appraisal systems, control mechanisms, etc.). On the other hand, effort is almost never measured and receives less attention.

This lack of attention to effort probably has two causes. First, effort is largely a hypothetical construct and consequently must be inferred from observable data (i.e., performance). This is very difficult to do in all but the most simple task where ability is unimportant. Therefore, the value of effort in determining individual rewards is minimal. Second, since organizations generally do not establish their goals in terms of effort, it is difficult to translate effort into organizational goals. Thus, effort has little value in evaluation and control systems. Performance, on the other hand, is more likely to be observable and related to organizational goals. Therefore, it is the object of organizational attention. As a result, performance alternatives rather than effort levels are likely to be the initial focus of individual choices. Based on the preceding discussion, motivation should not be defined as the force to choose high effort because choices among effort levels may not be directly relevant to obtain values. Performance alternatives are suggested as a better subject of choice models, particularly expectancy theory. Reconceptualizing the act as performance rather than effort can be implemented easily and is illustrated best by using Vroom's example (p. 194).

In order to illustrate how individuals may choose between effort levels, Vroom presented the E's and V's for three hypothetical subjects he called cases. He presented this data on two levels of performance (high and low) and two levels of effort (also high and low). Further, all cases had a +1.0 valence for high performance and a 0 valence for

low performance, implying that the evaluation of the association between performance and valued outcomes had already occurred. By varying the expectancies that high and low effort would lead to high and low performance, Vroom was able to demonstrate that the effort levels would have different force and, consequently, different probabilities of occurrence. While Vroom's example may be useful to illustrate the mechanics of the model, it implies that behavioral choices are between effort levels. However, it can be shown that the "force to perform at specific performance levels" can be calculated using the same information contained in Vroom's example. Table 1 illustrates how this might be accomplished. The valences associated with high and low performances have been changed from +1 and 0 to +2 and +1 respectively to help clarify interpretations to be made.

As shown in Table 1, the force to expend a particular amount of effort is calculated by first multiplying the expectancy that the exertion of that amount of effort will result in attaining performance level i and then summing the products over all performance levels. Using the same information, the force to perform at a particular level can be obtained by first summarizing the individual's potential to attain that performance level as a single expectancy--the expectancy that the performance level could be reached. This can be taken as being equivalent to the maximum expectancy associated with the performance level over all the effort categories. The force to perform at that level is then the product of this summary expectancy and the valence associated with the performance level. In choosing performance, as when choosing effort, the frequency of a choice is a function of the size of the force associated with it. For these three cases, it would be predicted that Cases 1 and 2 would be high performers while Case 3 would be a low performer. Once this performance choice has been made, effort will be adjusted to the level necessary to achieve the performance chosen. Therefore, Case 1 may put forth low effort and because of high ability still be a high performer. Support for this result has been presented by Bryan and Locke (1967).

On the basis of the above discussion, it appears that contrary to typical usage, motivation in the performance model should not be interpreted as the force to exert effort. As an alternative, it is tempting to define motivation as the force to perform. However, this would be just as inappropriate. If we examine a second problem with Vroom's conceptualization of motivation this becomes apparent. Recall that force is the product of E and V. Therefore, if force were defined as motivation productivity would be a function of ability x (ExV).[1] However, upon examination of what E estimates, as we shall see below, it is reasonable to interpret E as an estimate of ability. Consequently, if force were defined as motivation, ability would be entered in the performance equation twice--once as an expectancy and again as a separate measure. This redundancy is evident if motivation is defined as either the force to exert effort or force to perform.

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[1]Ability in this context refers to a combination of factors including training, experience, technology, procedures, and aptitude.

Table 1

Hypothetical Effects of Valence and Expectancy on Effort and Performance Choices

Case		Valence of High Performance +2	Valence of Low Performance +1	Force for Effort Σ (Valence X Expectancy)
1	Expectancy that high effort will result in indicated performance	1.00 (A)	.00	2.00
	Expectancy that low effort will result in indicated performance	1.00 (B)	.00	2.00
	Expectancy that performance level could be obtained = Max (A, B)	1.00	.00	
	Force to perform (Max (A,B) x Valence)	2.00	.00	
2	Expectancy that high effort will result in indicated performance	1.00 (A)	.00	2.00
	Expectancy that low effort will result in indicated performance	.00 (B)	1.00	1.00
	Expectancy that performance level could be obtained = Max (A, B)	1.00	1.00	
	Force to perform (Max (A,B,) x Valence)	2.00	1.00	
3	Expectancy that high effort will result in indicated performance	0 (A)	1.00	1.00
	Expectancy that low effort will result in indicated performance	0 (B)	1.00	1.00
	Expectancy that performance level could be obtained = Max (A, B)	0	1.00	
	Force to perform (Max (A,B) x Valence)	0	1.00	

Notice in Table 1 that Case 1 expects to be a high performer no matter what his level of effort (a perception of high ability). Case 2 expects high performance only with high effort, and low performance with low effort. This is representative of moderate ability. Case 3, by expressing the expectancy of certain failure regardless of effort, is representative of low ability. Thus, the only difference between the predicted performance of these three cases is due to their perceptions of their ability. The valence of high and low performance is constant between cases, and therefore, cannot contribute to a differential prediction of individual performance. It can be said, then, that individuals are equally motivated to perform well and that ability makes the only difference in their performances. In situations where there are different valences for the performance levels, as well as differences in ability, differences in relative performance will be the result of both factors.

As should be apparent, to be consistent with the performance model, motivation should be defined as the valence associated with the performance alternatives. If the valence for high performance is much greater than low performance, an individual will be motivated to be a high performer. Ability, in this formulation, is the expectancy or probability of success. Reconceptualizing Vroom's formulations in the above fashion eliminates the confounding of motivation and ability and should be a more appropriate test of expectancy theory predictions of performance.

The final conceptual issue is the actual form of the equation necessary to calculate the force to engage in an act, in this case performance at a given level.

Vroom describes the general force model as:

$$F_i = \sum_{j=1}^{n} E_{ij} \left(\sum_{k=1}^{n} I_{jk} V_k \right). \qquad (1)$$

Where F_i = force toward act_i; E_{ij} = the expectancy or probability that act_i will result in performance j; I_{jk} = the instrumentality of performance j for outcome k; and V_k = the valence of outcome k. However, for the present research, the new force model to perform is calculated as follows:

$$F_i = \sum_{j=1}^{n} \left[E_i P_{ij} V_j + (1 - E_i P_{ij}) \overline{V}_j \right]. \qquad (2)$$

Where F_i = force to perform at level $\underline{i}$; E_i = the individual's expectancy that he could perform at level $\underline{i}$; P_{ij} = the perceived likelihood that

performance at level i will result in outcome j; V_j = the valence of obtaining outcome j, and $\overline{V}_j$ = the valence of not obtaining outcome j.

Equation 2 is different from Equation 1 in five primary ways:

1. It identifies the act as performance.

2. The expectancies (E_i) are the maximum perceived probability of performing at each performance level.

3. The probabilities (P_{ij}) that performance at each specific level will result in the outcomes replace instrumentality.[2]

4. The probability of being able to perform (E_i) is multiplied with each P prior to summation rather than after the summation.

5. Finally, the complement of EP, (1-EP), is multiplied with $\overline{V}_j$ and added to the force so the list of outcome states associated with performance is exhaustive. That is, the sum of the probabilities of obtaining and not obtaining the outcome as a result of performance is 1.0 (Edwards, 1954).

While other conceptual issues could be raised, it was felt that those presented above offer the greatest potential for improving the model.

Measurement Issues

Turning from conceptual to measurement issues, a number of authors have pointed out that to date no adequate test of Vroom's original theory exists (Heneman & Schwab, 1972; Mitchell, 1974). In addition to the conceptual problems, tests of expectancy theory have suffered from measurement inadequacies. It has been also pointed out elsewhere (Nebeker & Mitchell, 1974; Mitchell, 1974) that, because expectancy theory is a theory of individual choice between alternative, within-subject analyses are appropriate. As indicated in Equation 2, this means that data must be collected for a number of alternatives available to the individual and predictions about performance made on the basis of the relative forces for these different levels. Typically, in previous research, the force to exert effort has been calculated for only one level of effort. A between-subjects analysis is then performed to see if high force is associated with high effort. As should be obvious, an individual does not choose between two alternative actions by comparing his force for just one of those alternatives with the forces of other individuals for that same alternative. The relative values between competing alternatives

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[2]This is necessary when multiple performance levels are used since correlations are no longer meaningful.

need to considered before a choice can be made. Given that data are collected for several alterntives and their forces calculated, the theory predicts that the frequency that an individual chooses an alternative will be a function of the relative size of the force. Alternatives with large forces will be chosen more often than alterantives with small forces. A within-subjects test of this predicted relationship is easily obtained by simply correlating the force for each alternative with the frequency of the choice of the different alternatives for each individual. For example, if data were collected on seven alternative actions and on the frequency of choosing these seven, a correlation would be calculated with N = 7. This represents a test of the strength of association between the magnitude of the force and the frequency of choice for each individual.

If the alternatives are ordered along a continuum or are actually production rates, it is also possible to make a numerical prediction about which alternative an individual will typically choose. This prediction can then be compared with the criterion across subjects as a test of the association between force and behavior. In this instance, the individual predictions, which are based upon within-subject comparisons of alternatives, are correlated with average performance. This between-subject method avoids the scaling and between-subject comparability problems associated with most between-subject analyses. It should be pointed out, however, that it is still necessary to collect data on several alternatives in order to create these individual predictions.

A second measurement problem has recently been raised by Schmidt (1973). He maintains that, because the scales used to measure the components of expectancy theory are interval at best, it is inappropriate to multiply them as proposed. He bolsters his argument by the algebraic proof that, if constants are added to each component of Vroom's Force model (the equivalent of changing a ratio scale to interval) before multiplication, the resulting product has three added factors, two of which are not constants but variables. Consequently, the addition of these variables changes the correlations between the F and the criterion. His argument is based on the logic of normative measurement (Cattell, 1944) and a between-subjects analysis. However, if a within-subject analysis is performed, the ordinal properties of the forces are invariant within a subject and, therefore, the predictions are not affected to any large degree by the addition of a constant. What this implies is that, if within-subject analyses are performed or predictions based on within-subject comparisons are made, Schmidt's criticisms would have little impact. It can also be shown that if the valences are interval and the expectancy measure considered ratio (as Schimidt suggested he was willing to do), then the inclusion of the complement of the probabilities (1-EP) in the expanded model presented above results in the force simply having a constant added to it and does not change any correlations.

The research reported below is a field test of the validity of the reconceptualized expectancy model developed here. Part of this test is an assessment of the strength of association between predictions and actual performance both within- and between-subjects. It is hypothesized that expectancy model predictions will be positively related to objectively measured performance. In addition, the relationships between a number of individual difference and situation variables will be examined to help provide an understanding of individual and group performance.

METHOD

Subjects and Task

Fifty-six proof machine operators of a large bank's operations department served as subjects in the research. Three operators were male and the rest female. Of the 56 operators who originally participated, five were eliminated for a lack of sufficient data to create the necessary indices. In addition, the actual N for specific analysis varied because of additional missing data.

The proof operator's job is a key entry task similar to key punching. The amount of each check deposited in the bank is printed in magnetic ink at the bottom of the check by the operator's key entries. The magnetic ink allows the checks to be read by computer.

This particular task possesses some very unique and valuable characteristics for research of this type. First, it provided a fairly large number of subjects performing a standardized task. The homogeneity of task characteristics thus helped to control the influence different tasks may have had on our results. Second, detailed objective performance scores on each subject were kept as a matter of course in the department. These factors provided an opportunity to conduct a powerful test of the theory. Naturally, the ability to predict objectively measured performance is the strongest criterion in establishing the value of the theory. Third, in addition to having many of the scientific advantages associated with laboratory studies, this task was performed in a natural environment so there can be confidence in the generalizability of the results. The data included in this study were collected from two primary sources, department records and a questionnaire.

Department Records

In general, the department kept very complete and accurate records on each individual's performance. Performance was scored relative to a well established department standard. Individuals were routinely kept aware of their performance which was expressed as a percent of standard. For purposes of investigation, seven performance levels were selected: 150%, 130%, 115%, 105%, 95%, 80%, and 60% where 100% equals 871 items/hour. These were chosen because they covered the observed range and they also sufficiently differentiated performance to make within-subject analysis meaningful. Along with other personnel information, these records were used to construct the following variables.

1. Hours at performance levels ($PERF_i$). Since the department recorded the number of items each individual produced and the hours spent at the machine, it was possible to record the number of hours each individual worked at the seven performance levels (150%-60%). These scores then could be used for within-subjects analysis.

2. Average performance (AVEPER). An individual's average performance was also calculated for the month during which the study was conducted.

3. Previous performance (PREPERF). Average performance scores were obtained for each individual available during the month 3 months prior to the study. These data were included in the study for two reasons. First, it would allow us to see if the prediction of the model accounted for current performance better than previous performance. Second, our interactions with department personnel revealed that, 2 months prior to the study, a new supervisor had made a number of changes in the department's policies. As a result, we were anxious to see whether or not thse changes affected performance and whether or not the model was sensitive to them.

4. Aptitude (APT). Prior to this study, the department had developed an aptitude test as a selection device. The test was similar to the Minnesota Clerical Aptitude Test and had demonstrated validity in predicting performance. The aptitude scores were obtained from department records for use in the study even though only 32 of the 51 operators had such scores.

5. PAY. The actual pay for each individual in the study was determined from the department records for the month of the study.

Questionnaire

The questionnaire was designed to estimate the various components of the force model and related variables. Because of the conceptual and measurement issues discussed earlier, the questionnaire was somewhat different from those usually used in expectancy theory research. The specific components measured and examples of the items are outlined below. The questionnaire itself is included in the appendix.

Before any specific questionnaire items were written, it was necessary to define the behavior of interest and the outcomes which might be associated with it. In this department, it was clear that performance was the primary focus of attention.

The outcomes to be included in the questionnaire were developed in a structured interview with a small number of operators. The operators were asked to identify all the things which would be consequences of performing at various rates. Sixteen different outcomes were thus identified. These 16 were subsequently reduced to 8 after all the operators were asked to indicate their 4 most important outcomes on a short questionnaire. The 8 most frequently chosen outcomes were selected for use in the questionnaire. While more or fewer outcomes could have been selected, previous research (Parker, 1974) has shown that 5 to 10 outcomes are sufficient to stabilize force estimates.

The actual questionnaire employed asked for estimates of each of the components of the force model and the other variables as described below.

1. Expectancy (E_i) of being able to perform at each of the seven levels was estimated by having the subject indicate on a 0-100 scale the likelihood he/she could consistently perform at each level. The anchors for these scales were "impossible for me to do" and "couldn't be easier."

2. The probabilities (P_{ij}) of obtaining each outcome for performing at each level were estimated on scales similar to E_i. In this case, the subjects were asked, "How likely is it that you would get (outcome) if you consistently ran at _____% of standard." The scales were anchored by "never" and "a certainty."

3. The valence (V_j) of obtaining the outcomes were estimated on 10-point scales anchored with "totally unimportant" and "the best thing possible."

4. The valences ($\overline{V}_j$) of not obtaining the outcomes were also estimated on a 10-point scale but in negative units. The anchors for these scales were "totally unimportant" to "the worst thing possible."

Variables

Based on the responses to the questionnaire, the following two groups of variables were created. The first group is appropriate for within-subject analysis while the second group is intended for between-subject analysis.

1. Within-Subject Variables. Three separate predictors of the frequency of performance choices were made.

a. Force to perform at each level (F_i). F_i was computed from equation 2 above. For each subject seven forces were calculated, one for each of the seven levels of performance.

b. Expectancy of being able to perform at each level (E_i). This was taken directly from the questionnaire. E_i was included separately in order to test the multiplicative aspects of the model.

c. The valence of performance (VAL_i). Valence was computed as force except the E_i was eliminated from the equation. These variables are equivalent to the motivation associated with performance at each level but do not include the expectancy of success. A VAL_i was

computed for each performance alternative. It was necessary to calculate VAL_i separately so the multiplicative aspects of the full model might be tested.

2. Between-Subject Variables. It was mentioned earlier that, based upon the relative forces to perform at each alternative level, a single prediction of average performance could be derived. This was done with each of the following measures.

a. Predicted performance based on the full force model (PPFORCE). This variable was derived by averaging the actual performance alternatives weighted by the force to perform each alternative. Since it was possible to have negative forces, all forces were standardized to eliminate negative values prior to the weighting process. This was done with a simple linear transformation which calculated, for each subject, the Z scores for each of their forces and then added a constant to eliminate all negative numbers.

b. Predicted performance based on just valence (PPVAL). The procedure for calculating this variable was the same as PPFORCE, except the E_i was deleted from the compution of force prior to the standardization and weighting. PPVAL provides an estimate of predicted performance based on motivation independent of the effects of ability.

c. Predicted performance based on just expectancy (PPEXP). It should be recalled that E provides an estimate of ability. Ability is defined here as being different from aptitude, that is, it includes the effects of training, experience, and technology (including job design) in addition to individual aptitude. Predicted performance in this case was the average performance alternative weighted by the expectancy of success at each performance level. This represents a prediction of performance based on ability independent of motivation.

d. Effort (EFF). An effort score was also calculated for each subject. An individual's effort was inferred from current performance and aptitude. It was reasoned that the discrepancy between actual performance and performance predicted from aptitude alone is to a large extent the result of effort. That is, if an individual is performing higher than predicted based on aptitude (an overachiever), then high relative effort is inferred. Likewise, an underachiever expends a low amount of relative effort. Therefore, the relative amount of effort expended is calculated to be the ratio of actual performance to predicted performance based on aptitude.

e. Experience (EXPER). Experience was simply, the number of months on the job.

RESULTS

As indicated previously, the purpose of this research is to test the validity of the reconceptualized force model. In addition, the analyses include the other variables described above as a means to clarify the obtained relationships.

The basic analyses performed can be divided into two categories: (1) within-subject analyses and (2) between-subject analyses. Since variables derived from the model for the between-subject analyses were based on within-subject comparisons of choice alternatives, it may appear that these two types of analyses would be redundant. However, it will be seen that important differences in what can be learned from the two types of analyses do exist.

Within-Subject Analyses

In order to test the fit between performance predicted by the model and actual performance, the force for each alternative performance level was correlated with the number of hours worked at each level for each subject. In addition, a test of the hypothesized interaction between E and VAL was conducted by correlating each of the components of force with hours performed at each level. The results of these analyses are presented in Table 2.

Table 2

Average Within-Subjects Intercorrelations Between Objective Performance, Force Model and Components

	$PERF_1$	$FORCE_1$	E_1	VAL_1
$FORCE_1$	.50*	--		
E_1	.36*	.66*	--	
VAL_1	.05	-.02	-.75*	--

*$p < .001$ (probability based upon combined probability of independent cases) $N = 47$

As can be seen, on the average a strong relationship exists between the force to perform at each level and the actual hours spent working those levels. It is also important to observe the relationship between the components of force, E, and VAL separately. The relationships for

both components are smaller than for their multiplicative combination. This pattern provides support for the value of the multiplicative model. Table 2 also reveals two other pieces of information. First, for this data set, E is more important in determining force and, consequently, behavior than VAL, even though both are necessary for optimal prediction. Second, E and VAL are highly correlated but in a negative direction. This may appear to be a contradition of the independence of valence and expectancy. However, it should be pointed out that VAL as defined here is the product of the probability of obtaining the outcome given performance and the valence of the outcome. The latter is invariant over performance levels and, consequently, independent of E_i. What in fact are negatively related are E and the probabilities of obtaining the outcomes. That is, the more likely individuals can perform at a given rate, the less likely they will be rewarded for performing at that rate. On the basis of the above results, strong support for the force model as presented here is found.

An interesting question which may be asked of these data is whether or not the force model describes all individuals equally well. An examination of the distribution of the correlations for force, E, and VAL indicates that most individuals are described best by the full force model. Nevertheless, the strength of this relationship varies and a few individuals' choices are better accounted for by E or VAL alone. It would appear then that not all individuals make their behavioral choices according to the model's predictions. Whether these anomalies are the result of different choice processes or errors of measurement is an important question. Unfortunately, there are insufficient cases of each type to provide a clear answer to this question here. Therefore, further research is necessary to see if there are consistent styles of choice which are individual characteristics.

Between-Subject Analyses

In addition to the within-subject analysis, between-subject analyses were also conducted. The first of these is an intercorrelation of the principal individual differences variables outlined previously. The results of this analysis are presented in Table 3.

Table 3

Intercorrelations Among Between Subject Variables

Variable	Mean	SD	1	2	3	4	5	6	7	8
1. AVEPERF	100.08	17.57	--							
2. PPFORCE	97.81	12.57	.47[c](47)	--						
3. PPVAL	120.45	8.14	.10(50)	.37[b](47)	--					
4. PPEXP	89.72	8.41	.53[c](47)	.85[c](47)	.03(47)	--				
5. APT	20.69	4.48	.49[b](32)	.45[b](31)	.43[b](32)	.37[a](31)	--			
6. EFFORT	0.17	6.42	.03(31)	.36[a](31)	.31(32)	.30(31)	.02(32)	--		
7. PREPERF	83.40	24.10	.80[c](43)	.35[a](40)	-.05(43)	.38[a](40)	.42[a](27)	.08(27)	--	
8. PAY	536.78	65.10	.55[c](50)	.24[a](48)	.11(51)	.24(48)	.46[c](47)	-.04(32)	.79[c](43)	--
9. EXPER	28.33	23.39	.34[a](48)	.07(46)	-.07(48)	.12(46)	.20(46)	-.29(32)	.59[c](41)	.66[c](48)

Note: Number of cases in parenthesis

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

As can be seen again, the prediction of performance based on the force model is highly related to objective performance. In addition, this table presents a number of results which are interesting. On the basis of the correlation between PPEXP and AVEPER, one might be tempted to conclude that PPEXP is sufficient to predict individual performance. Indeed, it appears that PPVAL does not contribute to the prediction of average performance but actually attenuates the relationship slightly. In all probability, if only the between-subject correlations had been computed, this erroneous conclusion would have been reached and the full force model rejected for the more parsimonious PPEXP. However, on the strength of the within-subject analysis, this is untenable. The full force model is necessary to accurately account for both the variability and absolute level of performance. These data serve as an object lesson in the value of different analyses providing different information. In essence, the between-subject analysis provides only information about the association of force and individual performance relative to others' performance. All information about absolute performance is lost in the correlations. However, the within-subject analyses preserve this information. Some additional information contained in Table 3 helps support this conclusion.

Recall that PPFORCE, PPVAL, and PPEXP as predictions of average performance were made in actual performance units; that is, in percents of standard. Therefore, the closer the averages of these predictions were to the actual mean of performance, the better predictors they are. When the mean of PPFORCE, PPVAL, and PPEXP from Table 3 are compared with the mean of AVEPERF, it becomes obvious that both PPEXP and PPVAL are substantially different from AVEPER. In fact, when t-tests of these differences are conducted, they are highly significant ($t = -5.58$; $df = 45$; $p < .001$ and $t = 7.74$; $df = 47$; $p < .001$ respectively). PPEXP consistently underestimates performance while PPVAL consistently overestimates it. On the other hand, there is no significant difference between the mean of PPFORCE and actual performance (AVEPER) ($t = .96$; $df = 45$; n.s.). Therefore, since PPFORCE does not consistently over- or underestimate absolute performance, it more accurately accounts for performance in actual performance units.

In this particular situation, it appears that between-subject variability is a function of expectancies. Differences in perceived ability are responsible for the predictable variability in performance while combining motivation with expectancies accounts for absolute level of performance as well. When one considers this situation as well as that of most organizations, this result makes a good deal of sense. Generally, organizations attempt to motivate their employees through consistently applied compensation and work design policies. This consistency tends to minimize environmental differences. Thus, the motivating characteristics of the situation tend to be constant for all individuals. As a result, differences in ability tend to account for differences in performance. In another setting where individuals have equal ability but work in situations with differing motivation properties, motivation would account for most of the performance differences.

The preceding discussion suggests that attempts to test the model using a between-subjects analysis, which restrict either variability in motivation or ability, will appear to emphasize different components of the force model. Since most organizations make an attempt to motivate their employees equally, to the extent they are successful, ability is likely to appear as the sole or primary contributor to performance differences. However, what is often ignored in these situations is the impact that compensation and work design policies have on motivational base rate. The model would predict that, if a performance ceiling had not been reached, an increase in motivation overall would lead to general increases in performance without substantial changes in relative performance for individuals. This is, in fact, what happened in the present organization. As can be seen in Table 3, previous performance (PREPERF) is highly correlated to AVEPER. This would suggest that individual performance was very stable. However, when examining the means for AVEPER and PREPERF, obvious differences in performance are apparent and significant ($t = 10.92$; $df = 41$; $p < .001$). In the 3 months between data collections, performance had significantly increased. This performance difference remains even when those individuals new to the job were eliminated from the analysis, as they would be expected to improve as they learned the task ($t = 10.78$; $df = 26$; $p < .001$). It is clear then that general performance increases had occurred while relative performance remained fairly constant.

During the 3-month period, personnel, techniques, and equipment had not changed. Therefore, since changes in ability were not responsible for the increase in performance, then motivation must be. To test this notion, we went back to the organization several months after they completed the questionnaire and had all available operators who were included in both performance data sets respond to a retrospective version of our questionnaire (Campbell & Stanley, 1966). Instead of having the operators respond with their current situation in mind, we asked them to think back to the time their previous performance data were recorded and answer the question as things were then. The subjects indicated this was easy for them to do because the time in question was just prior to the change in supervision mentioned previously. Based on their answers to these questions, a t-test on the difference between motivation (PPVAL) to perform at the two times was computed. As expected, the difference was significant ($t = 8.46$; $df = 7$; $p < .001$). During the 3 months between the time the first performance data was recorded and the month of the study, individual motivation had dramatically increased. This general increase in motivation was accompanied by a general performance increase. It is interesting to note that between-subject correlational analyses are not sensitive to these changes since they occurred fairly uniformly within the group. Once again, if the environment changes consistently for a group, the relative differences within this new homogeneous environment will be due largely to ability. However, the differences in absolute performance between the two situations will be due largely to changes in the motivational properties of the situations.

What specifically happened to bring about the dramatic change in motivation and performance? While our research design does not allow an unequivocal answer to this question, an examination of the differences between the original and retrospective questionnaire shows that the effect of the new supervisor upon the operators was clear and substantial. The operators reported a strong increase in the likelihood that increased performance would result in the organizationally administered rewards important to them. Prior to the new supervisor's arrival, rewards contingent upon performance peaked after reaching 85% of standard. The new supervisor, however, implemented a policy where some rewards continuously increased with increases in performance while others did not reach asymptote until 100% of standard was reached. The observed effect of these changes on motivation as measured by our technique was dramatic.

Based on the above discussion, it appears that there are good reasons why the results of some previous expectancy research have produced weak results. For example, if between-subject analyses were conducted on subjects all working in essentially the same environment and expectancies of success or ability measures were not obtained, the relationship between performance and motivation would have been very small. As we have seen, such a situation would not provide a powerful test of the theory. Let us now return to Table 3, where a number of interesting findings, in addition to those above, are shown. These results are briefly described below.

1. The strongest relationship with AVEPERF is PREPERF. This should be expected since scaling differences are not a problem. It should be pointed out, however, that the size of this relationship does not reflect the changes in absolute level of performance that were observed across the board. Performance increases occurred which are not reflected in this analysis.

2. PAY and EXPER are both positively related to AVEPERF and even more strongly to PREPERF. The pay relationship demonstrates the performance contingency of pay in this department. The experience relationship demonstrates the learning aspects of task performance. It should be noted that the relationship between PAY and PREPERF is stronger than that between PAY and AVEPERF. This suggests that there is a lag between performance increases and the consequent pay raises since pay was not revised daily or even monthly. The larger relationship between EXPER and PREPERF than between EXPER and AVEPERF is explained by the fact that at the time the PREPERF data was collected, there was a larger proportion of recently hired employees who were learning the task. As they improved their performance to a level more consistent with their aptitude and motivation, experience became less important in determining their performance.

3. APT is highly related to AVEPERF, demonstrating the ability of the selection device to predict relative performance. APT is not, however, much help in understanding absolute performance since motivation is assumed a constant (except the effects of a generalized motivation which affects performance on the aptitude test) and both ability and motivation are necessary to predict absolute performance.

4. EFFORT is not related to AVEPERF. While this may be somewhat of a surprise, some research suggests it should not be. Bryan and Locke (1967) demonstrated that if subjects can obtain their performance goals by a small degree of effort, they will. That is, increases in ability while holding goals (or motivation) constant will result in reduced effort rather than in increased performance. Consequently, any attempt to relate effort to performance would need to consider the interactive effects of goals and ability upon the effort performance relationship. Some support for this is found with these data in the correlation between motivation level (PPVAL) and EFFORT. This relationship (.30, $p < .05$) suggests that increased motivation will be accompanied by increased effort when aptitude is controlled.

DISCUSSION AND CONCLUSIONS

The purpose of this research was to develop and test a reconceptualized expectancy model of performance. Strong and significant support for the model was obtained. It was found that, in both within- and between-subject analyses, objectively measured performance could be accounted for with the force model developed here. It was also shown that when multiplicatively combined, both ability and motivation are necessary to explain absolute performance. To put these results in perspective, it is worthwhile to compare them with previous expectancy research. In Mitchell's (1974) review of expectancy theory, 22 studies were reported which attempted to test the behavioral choice model. Of these 22 studies, only 5 reported any data on the adequacy of the model or its components to predict objectively measured performance. In these 5 studies, 13 relationships were calculated which test some aspect of the model's predictions. Only 6 of these relationships show statistically significant support for the model or its components. The average $\underline{r}$ for the studies which report correlations is .16, the largest being .39 or 15% of the variance in performance being accounted for by the model. By contrast, the present study found the correlation between predictions based on the force model developed here and objectively measured performance to be .50. In other words, 25% of the performance variance could be accounted for by the model's predictions. While there remains a large portion of the variance yet to be explained, the improvement over previous techniques is substantial and promising.

While correlations reported above are product-moment coefficients, it may be that these relationships are better tested with an ordinal statistic such as Spearman. Therefore, rho's were also calculated for the within-subject analysis. It was found that the average rho between force to perform and hours at each performance level was .68; that is, 46% of the variance in the ordinal information of performance was accounted for by force. Thus, this suggests that some attenuating error still exists in our calculations or choices were made at a more gross level of analysis than force alone. It appears that when the techniques employed here are used, expectancy theory has the ability to help understand employee performance and work motivation.

Because the results of this research show strong support for the reconceptualized force model, they have a number of interesting implications for theory and practice. Some of these implications are presented below.

1. Job performance will usually be the appropriate behavior when attempting to validate the behavioral choice model. This ought to be true unless a particular organization has as the behavior of interest (i.e., the basis for determining organizational goals, and rewards, etc.) some variable other than performance. For example, if an organization

developed a control structure to motivate or monitor time spent in activities other than performance, the usefulness of modeling choices among performance levels to validate the model would be reduced. Moreover, before undertaking any attempts to understand behavioral choice in an organization, it is important to identify the behavior(s) of interest for the organization. In most cases, especially at lower levels in the organization, this will be individual performance. However, it may differ at higher levels of authority or in non-line activities.

2. The force model should be employed to predict which alternative levels of performance are most likely. In so doing, it should be noted that between-subject correlations emphasize the relative differences of individuals with little information about the absolute level of performance. Consequently, these correlations will be most heavily affected by the differences between individuals. When individuals are studied in similar environments, performance differences will be largely accounted for by ability. In such cases, within-subject correlations provide for a better test of the fit between predictions and performance.

3. A careful consideration of the model presented here suggests some interesting implications for a confluence of this revised expectancy model, goal setting (Locke & Bryan, 1969; Latham & Yukl, in press), and operant conditioning (Jablonsky & Devries, 1972) as applicable to the work motivation literature. For example, it can be argued that the process of choosing a performance goal is a function of the attractiveness of the specific performance level (motivation toward it) and the perceived likelihood of being able to obtain it (expectancy). Therefore, the literature on goal setting may have an important relevance to expectancy theory as conceptualized here and vice versa. Additionally, it can be argued that the intent and purpose of operant conditioning programs in organizations is to increase the motivation to perform at higher levels (make them more attractive). In fact, the policy changes made in the proof department were very similar to those made by behavior modification practitioners. Therefore, the model presented here can describe the process by which performance is increased. It also has the added advantage of taking into account individual ability which operant models do not. Consequently, it is capable of making specific performance predictions of the amount of improvement expected for a given organizational change. More detailed examples of how this may be done are currently being prepared in a separate paper.

4. Because the adequacy of the model is determined from the agreement between predicted performance and actual performance in absolute performance units, the model has a very practical application. It now becomes possible to project the impact on performance of specific changes in ability, motivation, or both. For example, suppose an analysis of the data for an organization indicated that the employees do not

perceive increasing probabilities of a pay increase for improved performance. By inputting to the model hypothetical increases in the perceived probabilities of a pay increase for increased performance, the expected changes in actual productivity can be determined. The benefits of this projected productivity increase can then be evaluated in light of the costs expected to produce the change.

The above intervention would be an attempt to increase motivation by increasing the valence of higher performance levels. In some situations, it may not be feasible to increase motivation significantly, but it may be possible to increase ability or the expectancies of being able to perform at higher levels. This may involve selecting people with greater ability, applying an improved technology or procedure to the task, or improving training programs. In any case, the model would be capable of predicting the performance change for a given change in the expectancies of success. This again allows a cost benefit analysis of the hypothetical changes to be carried out. An extremely wide variety of potential changes can be evaluated with these procedures, including selection strategies, training programs, technological improvements, compensation policies, and job redesign and enrichment plans. Using the model as a diagnostic and evaluation tool should be extremely valuable to organization development activities.

While the support for the model shown here is promising, it is imperative that replications be conducted and extensions made which further refine the model and evaluate its usefulness in a variety of settings. These should include different organizations as well as true experimental studies to clearly establish the causal characteristics of force.

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APPENDIX A

BANK QUESTIONNAIRE

Navy Personnel Research and Development Center
San Diego, California

NPRDC is conducting research on the nature and structure of individual preferences and expectations in various work situations. As proof operators at Dataminder we are interested in how you view your job.

This information will help us better understand how to improve jobs. Your individual comments will be kept in strict confidence and will not be reported to any SCFNB source except in the form of grouped summaries which maintain your anonymity. We are requesting your identity only to facilitate making comparisons with additional information. If you believe answering these questions compromises your privacy feel free not to participate.

Thank you for your help.

Part I. Please answer all questions.

1. NAME: _____

2. AGE: _____

3. SPOUSES OCCUPATION: _____

4. MARITAL STATUS: SINGLE _____ MARRIED _____ DIVORCED _____ WIDOWED _____

5. NUMBER OF CHILDREN: _____

6. TIME IN PROOF AT SCFNB: _____years _____months

7. HOURS: _____Full Time _____Part Time

8. SHIFT: _____Day _____Night

9. SECTION NUMBER: _____.

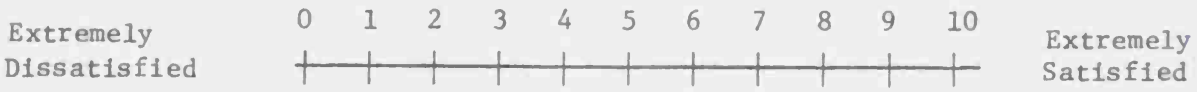
10. Have you had proof experience outside of SCFNB? Yes _____ No _____
If yes, Where? _____ How Long? _____ years _____ months

Part II.

In this part of the questionnaire we would like some general information on how you feel about your Proof job, and about some of the different jobs you could have.

Section A

Using the scale below, rate how satisfied you are or think you would be in the jobs listed below. Write the value which bests describes your satisfaction in the blanks next to the position.



How satisfied are you as...

1. A Proof Operator for Dataminder _____

How satisfied do you think you would be as...

2. A Proof Operator for another bank _____

3. A bank teller for SCFNB _____

4. A filing clerk _____

5. A key punch operator _____

6. A homemaker _____

7. Unemployed _____

Section B

1. How much longer do you plan to work in Proof? _____yrs _____mos

2. Of the following which comes closest to your most important reason for planning to stay in Proof?

_____It's the best job I can get.

_____I enjoy running the machines.

_____I like the other operators here.

_____I need the money.

_____It's the only marketable skill I have.

_____Management is concerned about my personal welfare.

3. As best as you can foresee, when you leave Proof, what will be the two (2) most probable reasons for leaving? Indicate your most probable reason by placing a 1 by it, and your second most probable reason with a 2.

I will probably . . .

_____Find a better job outside of the bank.

_____Quit because I don't like the work.

_____Retire when eligible.

_____Transfer to a different department in the bank or Dataminder.

_____Be promoted outside of Proof.

_____Quit because I no longer need to work.

_____Get layed off.

_____Quit because I don't like the people I work with.

_____Quit because my husband (or wife) gets transferred.

Section C

1. At what per cent of standard are you currently working? _____

2. Using the scale below, we would like you to estimate how <u>difficult</u> it would be for <u>you</u> to consistently run at the following per cents of standard. Assume that you would be using the same machines, procedures, etc. as you do now. Please write the appropriate scale value in the space provided.

Couldn't be easier 0 10 20 30 40 50 60 70 80 90 100 Impossible for me to do

		Difficulty
a.	150% of standard	_____
b.	130%	_____
c.	115%	_____
d.	105%	_____
e.	95%	_____
f.	80%	_____
g.	60%	_____

3. For the rates below, please check the one(s) where you feel the effort you would have to put in to make the rate equal the overall benefit (pay, satisfaction, recognition, etc.) you would get for it.

_____150%; _____130%; _____115%; _____105%; _____95%;

_____80%; _____60%

4. How often do the following problems prevent you from reaching the per cent of standard you try to attain. Again, place the scale value in the space provided.

Never — Always

0 1 2 3 4 5 6 7 8 9 10

A. Machine problems (dropping numbers, slow, etc.) _____

B. Having to get used to a new machine _____

C. Not having supervisor help when needed _____

D. Sloppy work in branches _____

E. Physically tired or not feeling well _____

F. Personal problem at home or elsewhere _____

G. Distractions (telephone ringing, conversations around me, etc) _____

H. Socializing _____

I. Interruptions (having to stop because pocket tapes have run out; need to leave machine, etc.) _____

J. Writing up slops _____

K. Changes in procedures _____

L. Correction of errors _____

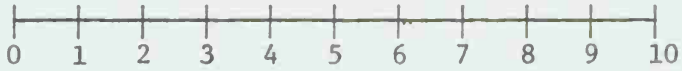
M. Angry with something about the job _____

N. Angry with someone on the job _____

Part III.

Section A

Different people like different things about jobs. In this section of the questionnaire we would like you to tell us how valuable it would be to you for a job to have certain characteristics. Using the scale below, please estimate the value you put on the following job characteristics.



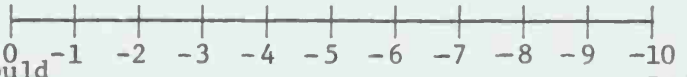
It would be unimportant

It would be the best thing about a job

1. How good is it, or would it be to...

	Value
a. Know what is expected of you?	_____
b. Be treated with respect?	_____
c. Work closely with pleasant people?	_____
d. Have a secure job?	_____
e. Have good working hours?	_____
f. Have high pay and benefits?	_____
g. Have stimulating and challenging work?	_____
h. Have quick and fair promotions?	_____

Now using the scale below, we would like to know the importance of not obtaining these characteristics.



It would be unimportant

It would be the worst thing about a job

2. How bad is it or would it be to <u>not</u> . . .

	Value
a. Know what is expected of you?	_____
b. Be treated with respect?	_____
c. Work closely with pleasant people?	_____
d. Have a secure job?	_____
e. Have good working hours?	_____
f. Have high pay and benefits?	_____
g. Have stimulating and challenging work?	_____

Section B

In this section we would like you to tell us how likely you think it is or think it would be to have the characteristics below in each of the listed jobs. Please use the following scale to make your estimates then write the number in the boxes provided.

1. How likely is it that you know or will know what is expected of you working as a...

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed

2. How likely is it that you will be treated with respect working as a...

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed

3. Work closely with pleasant people

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed

4. Have a secure job

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed

5. Have good working hours

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed

6. Have high pay and benefits

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed

7. Have stimulating and challenging work

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed
☐	☐	☐	☐	☐	☐	☐

8. Have quick and fair promotions

Proof Operator Dataminder	Proof Operator Another Bank	Bank Teller SCFNB	Filing Clerk	Key Punch Operator	Home-maker	Unemployed
☐	☐	☐	☐	☐	☐	☐

Part IV. In Part III we asked you about different jobs. We would now like to know how you feel about what you do on the job and things that may affect what you do.

Section A

In this section we would like you to tell us your value for some things you may receive for the work you do at Dataminder. Using the following scale please determine the importance of the outcomes listed below, and then write them in the spaces provided.

Totally unimportant — 0 1 2 3 4 5 6 7 8 9 10 — It would be the best thing possible

1. How good is it, or would it be for you to:

	Value
a. Keep your job?	_____
b. Get a $50/month raise?	_____
c. Get a feeling of accomplishment?	_____
d. Get help from supervisors or others?	_____
e. Do what is expected of you?	_____
f. Get recognition for your performance?	_____
g. Work independently?	_____
h. Make very few errors?	_____

Using the scale below, we would now like to know the importance of not obtaining these same outcomes.

Totally unimportant 0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 It would be the worst thing possible

2. How bad is it, or would it be not to:

		Value
a.	Keep your job?	_____
b.	Get a $50/month raise?	_____
c.	Get a feeling of accomplishment?	_____
d.	Get help from supervisors or others?	_____
e.	Do what is expected of you?	_____
f.	Get recognition for your performance?	_____
g.	Work independently?	_____
h.	Make very few errors? (How bad would it be to make many errors?)	_____

Section B

In this section we would like you to tell us how likely you think it is or would be to receive each of the listed outcomes by working at each of the given per cents of standard. Using the scale below please make your estimates and then write them in each box provided.

Never 0 1 2 3 4 5 6 7 8 9 10 A Certainty

1. How likely is it that you can or could keep your job if you consistently ran at

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

2. How likely is it that you can/could get a $50/month raise if you consistently ran at

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

3. Get a feeling of accomplishment

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

4. Get help from supervisors or others

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

5. Do what is expected of you

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

6. Get recognition for your performance

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

7. Work independently

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

8. Make very few errors

150%	130%	115%	105%	95%	80%	60%
☐	☐	☐	☐	☐	☐	☐

Section C

Suppose management established some performance requirement for obtaining a $50/month raise in salary. For each of the following requirements, indicate how valuable a $50/month raise would be if you had to work at the rate specified to obtain the raise. Select your response from some point along the following scale and fill in the blank provided.

Not important at all — Most important thing in your life

a. If you were required to work at 150% of standard? _____

b. If you were required to work at 130% of standard? _____

c. If you were required to work at 115% of standard? _____

d. If you were required to work at 105% of standard? _____

e. If you were required to work at 95% of standard? _____

f. If you were required to work at 80% of standard? _____

g. If you were required to work at 60% of standard? _____

JOB DESCRIPTIVE INDEX

Think of your present job. Think first about your WORK, then about your PAY, then about your OPPORTUNITIES FOR PROMOTION, then about your immediate SUPERVISOR, and last about your CO-WORKERS. Beside each of these characteristics, place:

✓ if it describes it
? if you cannot decide

A blank will mean that word does not describe your job.

THE WORK I DO _____

____Fascinating
____Routine
____Satisfying
____Boring
____Good
____Creative
____Respected
____Hot
____Pleasant
____Useful
____Tiresome
____Healthful
____Challenging
____On your feet
____Frustrating
____Simple
____Endless
____Gives sense of accomplishment

THE PAY I GET _____

____Income adequate for normal expenses
____Barely live on income
____Bad
____Income provides luxuries
____Insecure
____Less than I deserve
____Highly paid
____Underpaid

THE PROMOTION OPPORTUNITIES I HAVE _____

____Good opportunity for advancement
____Opportunity somewhat limited
____Promotion on ability
____Dead-end assignment
____Good chance for promotion
____Unfair promotion policy
____Infrequent promotions
____Regular promotions
____Fairly good chance for promotion

THE SUPERVISOR I HAVE _____

____Asks my advice
____Hard to please
____Impolite
____Praises good work
____Tactful
____Influential
____Up-to-date
____Doesn't supervise enough
____Quick-tempered
____Tells me where I stand
____Annoying
____Stubborn
____Knows job well
____Bad
____Intelligent
____Leaves me on my own
____Around when needed
____Lazy

THE CO-WORKERS I HAVE _____

____Stimulating
____Boring
____Slow
____Ambitious
____Stupid
____Responsible
____Fast
____Intelligent
____Easy to make enemies
____Talk too much
____Smart
____Lazy
____Unpleasant
____No privacy
____Active
____Narrow interests
____Loyal
____Hard to meet

The people you work with or near can affect how easy it is to get your work done by helping, being distracting, etc. Considering all the people in Proof, please indicate

a) The three proof operators you would prefer to work with or around

_____

_____

_____

b) The supervisor you would prefer to work with

_____

c) The three proof operators you think you would find most difficult to work with or around

_____

_____

_____

d) The supervisor you think you would find most difficult to work with

_____

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