The Use Of Financial And Nonfinancial Information For Evaluating Performance: An Attributional Perspective

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Abstract

This study utilized attribution theory to understand how executives use financial and nonfinancial information to evaluate departmental and managerial performance. An experiment was conducted in which 54 executives of a large retail department store were asked to evaluate the performance of a hypothetical retail selling department and the performance of its manager. The executives responded to 51 cases, each of which contained a different combination of values for eight performance cues. Four of the cues were financial and four of the cues were nonfinancial. Separate main-effects linear models were used to analyze how the subjects used the cues to arrive at judgments about departmental and managerial performance. The results supported a number of predictions based on attribution theory. First, the evaluations of performance were characterized by bounded rationality, as most subjects used one or more, but not all, of the cues to attribute blame or credit for performance outcomes. Second, the evaluations of performance relied on the cues in a way which indicated the existence of causal links between the performance outcomes reflected in the financial and nonfinancial cues, and managerial control and responsibility for those outcomes. Third, the financial and nonfinancial cues were used in distinctly different ways depending on whether the performance of the department or its manager was being evaluated. Fourth, the cues were used differently to evaluate managerial performance by experts and non-experts in that area. And finally, there was limited self-awareness of the relative importance of different types of information when making causal inferences.

Introduction

Evaluating performance is a critical element in assessing and improving organizational effectiveness and efficiency. Formal appraisals may also have pro-

found and lasting implications for the managers being evaluated, as they are often the basis for a multitude of decisions regarding managerial compensation, promotions, development and other human resource decisions. In spite of their organizational and personal significance, however, valid appraisals frequently are elusive

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goals. According to Bernardin and Russell (1993), performance evaluation is perceived as "one of the most troubling areas of human resource management" (p. 378) given the challenges involved in correctly identifying, gathering, perceiving, interpreting and evaluating all relevant information.

This study utilized attribution theory in an effort to understand how executives used information about the performance of an organizational unit to evaluate the performance of the unit and the performance of its manager. According to the responsibility assignment models offered by attribution theory (Martinko, 1995; Farquhar, 1995; Lord & Maher, 1991; Lord, 1985; Feldman, 1981), appraising managerial performance is a task that triggers complex cognitive processes involving the need to assess not only the results of an organizational unit, but also its manager's responsibility for causing those results.

This study was an experiment in which a number of cues were systematically manipulated to investigate their impact on the attributional processes involved in appraising managerial performance. It involved 54 operations and finance executives of a large retail department store, who were asked to appraise the performance of a hypothetical retail selling department and the performance of its manager. Separate main-effects linear models were employed to analyze how the subjects (Ss) used the financial and non-financial cues to arrive at judgments about departmental and managerial performance. The analysis also explored how these judgments might have been affected by the individual characteristics of the Ss.

There was a deliberate effort to make the experimental conditions as realistic as possible to eliminate a common criticism to the use of experiments in attributional research. Rather than using students or others without experience with performance appraisal in organizational settings, this study involved executives who were regu-

larly involved in the appraisal of managerial performance. The hypothetical department described in the experiment resembled departments in the retail store where the subjects worked. The subjects were also familiar with the type of information conveyed by the cues.

Another distinctive characteristic of this study was that it did not rely on self-reports to reconstruct how the subjects arrived at their judgments about the performance of the department and its manager. Instead, relative cue weights were derived from the linear models, and later compared with the self-reported cue weights to assess the degree to which the subjects were aware of their own judgment processes.

The next section summarizes the theoretical background of the study and states the hypotheses of the experiment. This is followed by a description of the method that was used, and the results that were obtained. The last section discusses the results of the study and the implications thereof for theory and practice.

Theoretical Background and Hypotheses

Attribution theory is an epistemological effort to understand "how people know" (Weiner, 1990). According to attribution theory, people seek information clues to find causes that explain why certain events occur to themselves and others. Depending on various dimensions of what they come to perceive as the "cause" of an event, people then experience different emotional reactions and develop different expectations and behavioral tendencies.

One of the first dimensions of causality that interested attributional theorists was locus of causality (Heider, 1958). Someone may succeed or fail in achieving a performance outcome depending on what he or she can and tries to do. What the person can do is jointly determined by internal characteristics, such as his or her ability, and by external factors, such as the difficulty of

the task. What the person *tries* to do is influenced by internal factors, such as the degree of willingness to expend effort to achieve the outcome in question. Heider (1958) proposed that the attribution of success or failure to factors internal to the actor, such as ability and effort, was more likely to lead to credit or blame for the results than external attributions to task difficulty. Thus, internal factors should be more closely associated with the evaluation of an actor's performance than external ones.

Subsequent studies revealed the importance of another important dimension of causality called controllability (Weiner, 1979). Success is more likely to be rewarded, and failure more likely to be punished, when these outcomes are attributed to factors under the control of the actor (such as effort), as opposed to factors beyond his or her control (such as aptitude). Consequently, factors perceived to be controllable should be more closely associated with rewards and punishments than those perceived to be non-controllable. Other studies have led to further refinements of the theory (Weiner et al., 1971) and to a greater understanding of how attributions are affected by particular types of information (Kelley, 1971), information overload (Maher, 1995), and the observer's preferences and beliefs (McDonald, 1995).

The literature on attribution theory has been steadily growing in scope, moving beyond a focus on psychological and sociopsychological phenomena (Weiner, 1986; Nisbett, 1972; Jones and Kelley, 1967; Jones and Davis, 1965; Heider, 1958) to a growing interest in the role that attributions play in organizational processes. These processes include leader-member interactions, motivation, conflict, performance appraisal and reward allocation (Allred, 1995; Farquhar, 1995; Ashkanasy and Gallois, 1994; Baron, 1988; Martinko and Gardner, 1982). This trend has been reflected in accounting scholarship as well. Attribution theory has been used to analyze auditor performance appraisals and turnover (Fogarty and Kalbers, 1993; Wolk,

1993; Kauffman, 1988), the control of management performance (Barnett, 1989; Shields, 1978), participative budgeting (Greenberg et al., 1994), conflicting expectations of auditors (Arrington, 1981) and several other areas (Murphy and Wetzel, 1993; Kaplan, et al., 1988, 1986).

Weiner (1995) welcomed the application of attribution theory to the understanding of organizational phenomena because he believed it could benefit both areas of study. Extending what is known about the influence of information input on causal attributions has important practical implications as well. In the area of performance appraisal, which is the central task of this study, the cognitive constraints associated with the attribution process may lead to distortions in appraisals. These distortions may then have adverse consequences for the allocation of organizational rewards such as pay and promotion, and for future employee motivation and performance.

The experiment described herein was an effort to gain a further understanding of how decision makers use various types of information to evaluate performance, and whether the ways in which they use this information can be predicted by attribution theory. The subjects were presented with different combinations of values for eight dichotomously scaled cues, which reported the operating results of a hypothetical retail selling department. Four of the cues were financial, and four were nonfinancial (they will be described in greater detail below). After each combination of cue values the subjects were asked to give two ratings, one for the performance of the department and one for the performance of its manager.

According to attribution theory, the appraisal of performance is a process characterized by bounded rationality (Simon, 1957). Judgments are rational in that they are based on information, but such rationality is limited by a series of filters in perceiving, interpreting and evaluating information (Maher, 1995; Lord,

1995). It was therefore predicted that most subjects would incorporate one or more, but not all, of the cues in their cognitive models of the variables associated with good or bad performance (Hypotheses 1A and 1B below).

Attribution theory also asserts that the evaluation of a manager's performance requires information which allows the evaluator to causally link performance outcomes to factors under the control and responsibility of the manager (Farquhar, 1995; Ashkanasy and Gallois, 1994; Kelley, 1971; Weiner et al., 1971). Thus, in order to blame or credit the managers for their performance, the subjects would be expected to utilize information that they considered to be under the manager's control, rather than information related to external factors.

The Ss' judgment models of the manager's performance were expected to be characterized by a stronger reliance on the nonfinancial cues in the experiment, which referred to areas more directly under a manager's responsibility and control (Hypothesis 2A below). In contrast, the Ss' judgment models of the department's performance were expected to show a stronger reliance on the four financial cues in the experiment, three of which were broad financial measures of operating performance. These broad financial measures provided no indication of external or internal causality, and therefore were not expected to play a significant role in the evaluation of the manager's performance (Hypothesis 2B below). Consequently, the subjects were expected to employ distinct judgment models when making inferences about the managers' responsibility for departmental outcomes, and were not expected to equate the performance of managers with the performance of their departments (Hypothesis 3 below).

Causal attribution is described in the literature as a subjective process in which the personal characteristics of the observers may influence how they perceive and interpret cues and outcomes. For example, experts have highly devel-

oped schemas which give them an advantage at recognizing the key aspects of a situation in their area of expertise, lead them to pay selective attention to special cues, and cause them to process information in qualitatively different ways (Lord, 1995; Lord and Maher, 1990; Chi, Glaser and Farr, 1988; Nisbett and Ross, 1980). In this experiment, expertise was manipulated through the professional background of the Ss. Some of the subjects were operations executives while others were finance executives. Almost all of the operations executives worked in retail selling departments very similar the ones considered in the study. When evaluating the performance of the hypothetical managers, the operations and finance executives were expected to make different uses of the cues in their judgment models. Consequently, the judgment models developed by the operations executives to rate the performance of the managers were expected to differ from the judgment models developed by the finance executives (Hypothesis 4 below).

Finally, attribution research indicates that individuals have varying levels of self-awareness regarding the relative importance of different types of information they incorporate in their causal inferences (Clapham and Schwenk, 1991; Kelley and Michela, 1980; Nisbett and Ross, 1980). In order to avoid the potential inaccuracies of self-reports, the present study derived the relative weights of cues using linear judgment models. For comparison purposes, the subjects were also asked at the conclusion of the experiment to report how much their ratings of managerial and departmental performance had relied, on average, on each of the eight cues. The subjects were expected to vary significantly in their level of self-insight, and therefore it was predicted that there would be substantial variation across subjects in the correlations between derived and self-reported cue weights (Hypothesis 5 below).

The purposes of this study, which were presented above as general issues, are now stated in the form of seven null hypotheses. The findings

for each of these hypotheses are described in a later section.

- H1A:** A majority of the subjects utilize all of the eight cues for judging the performance of the manager.
- H1B:** A majority of the subjects utilize all of the eight cues for judging the performance of the department.
- H2A:** The variance in the manager performance judgments explained by the financial cues does not differ from the variance explained by the nonfinancial cues.
- H2B:** The variance in the department performance judgments explained by the financial cues does not differ from the variance explained by the nonfinancial cues.
- H3:** The policies that the subjects use for judging manager performance do not differ from the policies that they use for judging department performance.
- H4:** The policies that operations executives use for judging manager performance do not differ from the policies that finance executives use for judging manager performance.
- H5:** The subjects' derived judgment policy cue weights do not differ from their self-reported cue weights.

Method

Setting and Subjects

This study was an experiment which was administered in a large retail organization. All of the subjects were executives. This term is defined somewhat broadly in the industry, and in this organization included personnel ranging from junior executives to senior management. The subjects were obtained from the following two groups:

- 1) *Operations executives.* Most of these were retail selling department managers. Others were area managers (who supervise retail

selling department managers), and a few were executives in non-selling departments.

- 2) *Finance executives.* These subjects worked in various finance functions, such as accounting, budgeting and accounts payable. Most of them were staff members, managers, and directors.

Operations and finance executives were chosen because they are often involved in similar judgment tasks, including the determination and evaluation of operating performance. Non-executives were excluded because they would not be involved in this type of judgment activity.

The experiment was conducted on six different occasions in five locations. These locations consisted of four retail stores, in which the operations executives worked, and the central offices, in which the finance executives worked. The first author administered the experiment on all six occasions.

A total of 54 subjects participated in the experiment. Twenty-five subjects (46%) were operations executives and 29 subjects (54%) were finance executives. All of the subjects had at least one year of experience, and most had four or more years of experience.

The Experimental Task

The subjects responded to combinations of eight dichotomously scaled cues, which represented a 2^8 factorial design. The eight cues described the performance of a hypothetical selling department in a retail store. Four of the cues were financial measures of performance:

- 1) Sales
- 2) Gross profit (sales less cost of sales)
- 3) Controllable expenses (payroll, receiving, marking, etc.)
- 4) Net operating income (gross profit less controllable expenses and overhead).

These four measures were included in a management accounting report of the organization in which this experiment was performed. Overhead expense was excluded because it was not directly affected by the performance of a retail selling department or its manager.

The other four cues were nonfinancial measures of operating performance, and did not represent traditional outputs of management accounting systems. A number of steps were taken to develop these cues. First, retailing and budgeting texts (Duncan et al., 1983; Welsch, 1976), trade publications (Wilson, 1980), and industry periodicals and newsletters were examined. The first author's prior experience as an executive within the industry was also considered as a source of ideas. Potential nonfinancial cues were then developed and discussed with others involved in management accounting research and industry experts in retail operations, finance and merchandising (Beninati, 1990; Jackson, 1990). This resulted in substantial refinements of the cues and the selection of four for the experiment.

After the experimental material was created, it was pretested on seven Ss, a majority of whom had significant experience in retailing or a related industry. Their reactions led to further refinements in the nonfinancial cues, which were finalized as the following:

- 1) Selling skills (courtesy, helpfulness and product knowledge)
- 2) Sales floor appearance (presentation of merchandise in compliance with company guidelines)
- 3) Department paperwork (accuracy and timely completion of paperwork)
- 4) Transaction time (time required to complete normal purchase and refund transactions)

Each financial cue was given a value of "better than plan" or "worse than plan", and each nonfinancial cue was given a value of "better than standard" or "worse than standard".

Fifty-one different combinations of cue values (cases) were presented to the Ss. This number was selected in the following manner. At first, 64 cases were administered, representing a 1/4 fractional replication of the 2⁸ factorial design. However, a majority of the pretest subjects stated that they began to lose interest in the task after approximately 50 cases. A 1/8 fractional replication, consisting of 32 cases, was considered as an alternative. However, this was less than the minimum number recommended by some authors for developing linear models containing eight cues (Hammond et al., 1980). Therefore, 51 cases, representing a 1/5 fractional replication, were used because this was the maximum number that could be presented to the subjects without jeopardizing their interest in the task.

A related issue concerned the representativeness of the cues. The judgment task must be reasonably representative of the real world, but the cues should also be uncorrelated to produce reliable and generalizable measures of cue usage (Chewning and Harrell, 1990; Libby, 1981). Because the task contained four financial cues which are related in the real world, a series of steps was employed in creating the cases which ensured that this relationship was not violated, but which also eliminated any significant correlation among the cues.

In the first step, a computer program was used to generate various random sequences of "better" and "worse" values for the cues in the 51 cases. The cues were correlated for each sequence, and the sequence with the lowest correlations (including none in excess of .250) was selected. Next, the 51 cases were reviewed for infeasible combinations of the financial cues. An example would be values of "better" for sales, gross profit and controllable expenses, and "worse" for net operating income. (Overhead was specified as constant in the experimental material.) All infeasible combinations were removed and replaced with feasible ones, and the cues were correlated again. This step was re-

peated several times to minimize the correlations. A correlation matrix for the 51 cases that were finally selected revealed that no pair of cues had a correlation with an absolute value greater than .250, and none of the correlations was significant. The average absolute value of the correlations was .097.

The cues were presented in two sequences in the experimental cases. The first sequence listed the financial cues first, followed by the nonfinancial cues (in the orders shown previously), while the second sequence listed the nonfinancial cues first. Each subject received only one of the sequences, which were randomly varied. The percentages of subjects receiving the first cue sequence or the second one were approximately equal.

Each subject provided two ratings after each of the 51 cases. The first was the S's judgment of the overall performance of the manager as described by the case. The second was the S's judgment of the overall performance of the department of the department. Each rating was made on a 10-point scale, which was labeled at one end as "very poor" and at the other end as "excellent".

After all 51 cases had been rated, each subject provided two more responses. The first was an assignment of 100 points among the eight cues based on how much each subject believed he/she had, on average, relied on each cue when making the manager performance ratings. The

second was an assignment of 100 points among the eight cues based on how much each subject believed he/she had, on average, relied on each cue when making the department performance ratings. These point assignments were used to analyze the insight of the subjects into their own judgment processes.

Background information was provided to the subjects in which the hypothetical department and its manager, each cue, and the two performance ratings were described and explained. The experiment was completed by most subjects in slightly over a half hour. For a more extensive discussion of the experimental design, and of its validity and reliability, see Schiff (1993).

The Responses

The 54 subjects responded to each of the 51 cases with a rating of the hypothetical department and a rating of its manager, resulting in a total of 5496 usable responses. Summary statistics pertaining to the responses of the total sample, and of the operations and finance executive subgroups, were presented and discussed in Schiff (1993).

Development of the Judgment Models

Models of the department judgments and the manager judgments of each subject which included the eight cues as main effects were defined as follows:

Department Main Effect Judgment Model

$$\text{DEPTRTG}_{ij} = b_{1i}\text{NETSALES}_j + b_{2i}\text{GRPROFIT}_j + b_{3i}\text{CONTEXPS}_j + b_{4i}\text{NETOPINC}_j + b_{5i}\text{SELLSKLS}_j + b_{6i}\text{SLSFLAPP}_j + b_{7i}\text{DEPTPPWK}_j + b_{8i}\text{TRANTIME}_j + e$$

Manager Main Effect Judgment Model

$$\text{MGRRTG}_{ij} = b_{1i}\text{NETSALES}_j + b_{2i}\text{GRPROFIT}_j + b_{3i}\text{CONTEXPS}_j + b_{4i}\text{NETOPINC}_j + b_{5i}\text{SELLSKLS}_j + b_{6i}\text{SLSFLAPP}_j + b_{7i}\text{DEPTPPWK}_j + b_{8i}\text{TRANTIME}_j + e$$

Where

DEPTRTG_{ij} = The rating of department performance by subject i for case j

MGRRTG_{ij} = The rating of manager performance by subject i for case j

NETSALES_j = The value of net sales for case j

GRPROFIT_j = The value of gross profit for case j

CONTEXPS_j = The value of controllable expenses for case j

NETOPINC_j = The value of net operating income for case j

SELLSKLS_j = The value of selling skills for case j

SLSFLAPP_j = The value of sales floor appearance for case j

DEPTPPWK_j = The value of department paperwork for case j

TRANTIME_j = The value of transaction time for case j

Table 1 contains summary statistics for the R^2 values of the department and manager main effect judgment models for the total sample and for the two subgroups. It can be seen from this table that the main effect models described a major portion of the variance in the Ss' department and manager ratings. The mean R^2 values for the total sample and for the two subgroups were comparable to those obtained in prior studies, and nearly 80% of the individual department and manager judgment models had R^2 values greater than .70.

Results

Hypotheses 1A and 1B were tested through

a tabulation of the number of times each cue had a significant beta weight in the judgment models of all 54 Ss. For both the department and the manager judgment models, each time the cue weight was significant at $p = .05$ or less it was deemed to have been utilized, and was included in the tabulation.

Table 2 shows the results of these tabulations. Thirty-four subjects (63%) utilized at least six financial and/or nonfinancial cues in their manager judgment models, but only nine subjects (17%) utilized all eight cues. Comparable results are shown for the department judgment models. In addition, the average number of cues utilized by the 54 subjects in the manager judgment

Table 1
Summary Statistics for R^2 Values of
Department Judgment Models and Manager Judgment Models

	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
<u>Department Models</u>			
Total Sample	54	.774	.117
Operations Executives	25	.783	.111
Finance Executives	29	.766	.124
<u>Manager Models</u>			
Total Sample	54	.777	.092
Operations Executives	25	.778	.093
Finance Executives	29	.777	.092

ment models was 6.0, and the average number utilized in the department judgment models was 5.3. The median number of cues utilized by the 54 subjects in the manager judgment models was 6.0, and the median number utilized in the department judgment models was 5.0. Based on the failure of the subjects to incorporate all eight cues into their judgment models, Hypotheses 1A and 1B were rejected.

Hypothesis 2A was tested in three steps. First, as described in Cody and Smith (1991) and Pedhazur (1982), the partial sums of squares of the four financial cues in each S's manager judgment model were totaled to determine the variance explained by the four financial cues. Next, the partial sums of squares of the four nonfinancial cues in each S's department judgment model were totaled to determine the variance explained by the nonfinancial cues. Then, these totals were compared for all 54 subjects and for both subgroups using a paired-comparisons t-test. Hypothesis 2B was tested the same way, except the department judgment models were used instead of the manager judgment models. The results for both hypotheses are shown in Table 3.

The results in this table reveal that Hypothesis 2A was rejected for the total sample. The variance in the manager judgment models explained by the nonfinancial cues was significantly greater than the variance explained by the

financial cues for the total sample. Hypothesis 2A was rejected for the subgroup of operations executives as well. For the subgroup of finance executives, the results were in a similar direction although they were not significant.

Table 3 reveals that Hypothesis 2B was also rejected for the total sample. For Hypothesis 2B, however, the variance in the department judgment models explained by the financial cues was significantly greater than the variance explained by the nonfinancial cues. In addition, Hypothesis 2B was rejected for both subgroups of executives.

Hypothesis 3 was tested using multivariate analysis of variance (MANOVA). The independent variable was the type of judgment model (department or manager), and the dependent variables were the weights for the financial and nonfinancial cues in the corresponding judgment model. The MANOVA results disclosed highly significant differences between the policies that the subjects used for judging department performance and the policies they used for judging manager performance. The Wilks' criterion F values (and related probabilities) for the total sample, the finance executives and the operations executives were 8.83 (.0001), 4.66 (.0004) and 4.86 (.0002), respectively. Therefore, Hypothesis 3 was strongly rejected for the total sample and for both subgroups.

Table 2
Subjects Utilizing at Least ____ Cue(s) in
Their Department and Manager Judgment Models

<u>Department Models</u>	Cues Utilized							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Number (%) of	54	54	53	45	35	24	15	6
Total Sample	(100)	(100)	(98)	(83)	(65)	(44)	(28)	(11)
<u>Manager Models</u>	Cues Utilized							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Number (%) of	54	54	54	53	44	34	20	9
Total Sample	(100)	(100)	(100)	(98)	(81)	(63)	(37)	(17)

Table 3
Comparisons of Variance in Judgment Models
Explained by Financial Cues and Nonfinancial Cues

	<u>N</u>	<u>Cues With Greater Partial SS</u>	<u>T Value</u>	<u>Prob. > T</u>
<u>Department Judgment Models</u>				
Total Sample	54	Financial	3.67	.0006
Operations Executives	25	Financial	2.52	.0187
Finance Executives	29	Financial	2.62	.0139
<u>Manager Judgment Models</u>				
Total Sample	54	Nonfinan.	-2.81	.0070
Operations Executives	25	Nonfinan.	-3.18	.0040
Finance Executives	29	Nonfinan.	-0.92	.3638

Table 4 displays the average weights of the four financial cues and the four nonfinancial cues in the department and manager judgment models of the total sample and of both subgroups. It also reveals the extent to which each cue had weights in the department judgment models of the subjects which were different from the weights that it had in the manager judgment models. For the total sample, Table 4 shows that every cue except controllable expenses had department judgment model weights which were significantly different from its manager judgment model weights. Table 4 also shows that six of the cues had significantly different department and manager judgment model weights for the operations executive subgroup, and that five of the cues had significantly different department and manager judgment model weights for the finance executive subgroup.

A comparison of the average weights in Table 4 reveals that, for the total sample, the three significantly different financial cues were more influential in the department models, while the four significantly different nonfinancial cues were more influential in the manager models. A similar pattern exists for the operations executive

subgroup. For the finance executive subgroup, Table 4 shows that two of the three significantly different financial cues were more influential in the department models, while the third financial cue and both significantly different nonfinancial cues were more influential in the manager models.

Hypothesis 4 was also tested using multivariate analysis of variance. The independent variable was whether the subject was an operations or a finance executive, and the dependent variables were the weights of the cues in the S's judgment model. The MANOVA results revealed that the manager rating models of the operations executives were significantly different from the manager rating models of the finance executives. The Wilks' criterion F value for this result was 2.84, and the related probability was .0121. Therefore, Hypothesis 4 was rejected. The cues on which the weights of the operations and finance executives varied significantly were controllable expenses (finance executives were higher), selling skills (operations executives were higher) and sales floor appearance (operations executives were higher).

Table 4
Average Weights of Each Cue in
Department Judgment Models and Manager Judgment Models

<u>Financial Cues</u>	<u>NETSALES</u>	<u>GRPROFIT</u>	<u>CONTEXPS</u>	<u>NETOPINC</u>
Total Sample (N=54)				
Department Models	1.41	1.51	.98	1.42
Manager	.91***	.86***	1.12	.82***
Operations Executives (N=25)				
Department Models	1.71	1.67	.98	1.37
Manager Models	1.04**	.97**	.87	.80**
Finance Executives (N=29)				
Department Models	1.14	1.38	.97	1.46
Manager Models	.80	.77**	1.33*	.84*
<u>Nonfinancial Cues</u>	<u>SELLSKLS</u>	<u>SLSFLAPP</u>	<u>DEPTPPWK</u>	<u>TRANTIME</u>
Total Sample (N=54)				
Department Models	.99	.85	.51	.59
Manager Models	1.41*	1.39***	1.24***	.86*
Operations Executives (N=25)				
Department Models	1.17	.94	.53	.49
Manager Models	1.77	1.59***	1.21***	.85*
Finance Executives (N=29)				
Department Models	.83	.78	.49	.68
Manager Models	1.09	1.22**	1.27***	.87
* Difference significant at $p < .05$				
** Difference significant at $p < .01$				
*** Difference significant at $p < .001$				

Hypothesis 5 was tested in two steps. First, the weight of each cue was expressed as a percent of the total of the weights for all eight cues. Next, these percentages were correlated with the Ss' self-reported cue weights which, as described earlier, were represented by their assignments of a total of 100 points among the eight cues. Fifty-four correlations were performed for the department judgment models, and 53 correlations were performed for the manager judgment models since one subject did not complete the point assignment for the manager judgment model.

Table 5 shows the results of this analysis. The mean of the correlations for the total sample was just .55 for the department judgment models and .53 for the manager judgment models. Fifty

percent of the subjects had nonsignificant ($p > .05$) correlations for the department models, and 57% had nonsignificant correlations for the manager models. While the maximum values indicate that some of the subjects had high levels of insight, this was not the case for many of the others. Additionally, the wide ranges and the large standard deviations of the correlations reveal that there were substantial individual differences in the Ss' levels of insight. Based on these results, Hypothesis 5 was rejected.

Discussion

The results of this study help substantiate the predictive and explanatory powers of attribution theory. The support for the six theory-inspired

hypotheses is particularly impressive in view of the fact that the experiment departed from the familiar territories usually explored in causal attribution literature by involving different kinds of information (financial and nonfinancial measures of operating performance), and different types of subjects (operations and finance executives).

Based on attribution theory, it was predicted that the Ss' use of financial and nonfinancial information to evaluate performance would be characterized by bounded rationality. While all of the Ss' judgment processes were rational in that they incorporated at least three of the cues on which the performance judgments were supposed to be based, a large majority of the total sample, and of both the operations and finance executive subgroups, did not use all eight cues. This indicates that there was also some amount of filtering in the perception, interpretation and evaluation of the experimental stimuli by most of the Ss. Moreover, these findings were based on cue weights derived directly from the judgment models rather than self-reports about cue utilization. Therefore, the subjectivity of reconstructed logic and possibly limited self-insight was not a contributing factor. As will be discussed in more detail later, this is an important consideration in the analysis of judgment processes.

The evaluation of managerial performance also relied more strongly on certain types of information than on others. Based on the causal attribution theory, it was expected that nonfinancial cues would play a more significant role in explaining the manager ratings because they referred to phenomena more directly under a manager's control and therefore attributable to factors internal to the manager. The financial cues

could be more easily affected by external factors, such as consumer spending and decisions made by corporate purchasing agents about the merchandise to be purchased and the prices at which it would be sold. Of the four financial cues, only controllable expenses could be perceived as related to phenomena over which the manager exerted some control. As expected, the variance in the manager judgment models explained by nonfinancial cues was significantly greater than the variance explained by financial cues for the sample as a whole and for the operations executives. The results were also in the expected direction for the finance executives, but they were not statistically significant.

Direct comparisons of the manager and department judgment models also revealed significant differences between the models used by the subjects to evaluate the performance of the hypothetical managers and the models used to evaluate the performance of the corresponding departments. This was true for the sample as a whole, and for both the operations and finance executives subgroups. The results of these direct comparisons further substantiated the expectation that the evaluation of managerial performance would involve cognitive processes which were different than those which would be involved in the evaluation of departmental performance.

The importance of the nonfinancial cues in the manager judgment models have a number of theoretical and practical implications. In many organizations, executives in charge of evaluating the managerial performance are only provided with financial measures like the ones used in this study, which have traditionally been the focus of internal management accounting performance reports. These executives do not receive the type

Table 5
Correlation of Derived and Self-Reported Cue Weights

	<u>N</u>	<u>Min.</u>	<u>Max.</u>	<u>Mean</u>	<u>Std.</u> <u>Dev.</u>	<u>% Non-</u> <u>Signif.</u>
Department Models	54	-.58	.97	.55	.397	50
Manager Models	53	-.89	.99	.53	.395	57

of nonfinancial information that was found in this study to have a significant influence on judgments about managerial performance.

Moreover, attribution theory holds that performance appraisers need to know not just outcomes, but information which allows them to assess the degree of credit or blame that the person under evaluation should receive for those outcomes. Rewarding or punishing individuals based on results over which they have little or no control can have adverse consequences for organizations. Invalid performance appraisals lead to inequities in decisions about pay and promotions. This may affect not only the morale and future performance of the individuals who are beneficially or adversely affected by the appraisals, but also the morale and performance of their peers and subordinates.

The results of this study suggest that organizations should identify, generate and make available to executives the nonfinancial measures of operating performance which are most appropriate for their lines of business. These results also provide empirical support for the growing interest in nonfinancial measures among researchers and practitioners (Maher, 1997, Kaplan and Norton, 1991, Eccles, 1991). Management accounting research can play an active role in helping organizations develop nonfinancial measures, possibly by employing using some of the techniques used in this study and elsewhere (Kaplan and Norton, 1996).

As noted above, causal attribution is a subjective process in which the personal characteristics of the observers may influence how they perceive and interpret cues and outcomes. The results showed significant differences between the manager judgment models of the operations executives and the manager judgment models of the finance executives. The cues on which the weights of the operations and finance executives varied significantly were controllable expenses (finance executives were higher), selling skills (operations executives were higher) and sales

floor appearance (operations executives were higher).

Almost all of the operations executives worked in retail selling departments similar the ones considered in the study, whereas the finance executives did not. These results suggest that individuals who have a first-hand knowledge of the area being evaluated should be included in the development and implementation of performance appraisals. Otherwise, these appraisals may reward and motivate the wrong types of behavior.

Finally, this study supports other attribution theory research indicating that people vary considerably in their awareness of how much they rely in different types of information when judging the performance of others. The mean correlations of the derived and self-reported cue weights indicated a generally modest level of insight about relative cue utilization. This was true both for the sample as a whole and for the operations and finance executive subgroups. Moreover, there was substantial variation in the correlations between the Ss' derived and self-reported cue weights regardless of their functional backgrounds.

This suggests that many executives may believe, and tell others, that they are following certain policies for evaluating performance, but that such beliefs may be incorrect. Making executives aware of this potential discrepancy, and providing them with models of their judgment policies, might increase the agreement between the policies that they lead others to think that they are using (and upon which others may base their expectations and behavior), and those which they actually do use. Also, from a methodological point of view, these findings indicate that studies of performance evaluation judgment processes should not rely exclusively on self-reports to measure the use of different cues.

Suggestions for Future Research

Many opportunities exist to build upon the above findings. Within-subject, longitudinal studies could be

conducted to observe how the subject's attributional styles and judgment models vary over time. Real data and outcomes could be used in order to assess the predictive ability of a subject's judgment models. The effects of interim feedback and different time constraints could be explored with minor modifications in the experimental design. A post-experimental questionnaire could ask additional questions about the subject's beliefs regarding how much control the hypothetical manager might have over each of the financial and nonfinancial measures of operating performance. This would contribute to a more thorough understanding of the causal attribution process. Further analysis of the above results could be performed by developing, administering and recording reactions to performance judgments based on the self-reported cue weights with those based on the actual, derived cue weights. A particularly intriguing direction for future research would be the comparison of group versus individual judgments, which would illuminate the effects of group dynamics on causal attributions and the ensuing judgments. Additionally, the external validity of this study could be explored by replications that investigate the sensitivity of the results to a variety of design elements such as the type of organization, the type of stimuli contained in the experimental task, the type of recording instruments, and so on.

Researchers and practitioners have a common stake in illuminating the process of evaluation of managerial performance. This study suggests that causal attribution theory can offer powerful insights into the types of information executives need to judge managerial performance, and on how they use different types of information. Such insights are essential for improving the accuracy of performance appraisals, which are critical for organizational effectiveness, and which have direct implications for the professional and personal lives of the individuals being evaluated.□

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References

1. Allred, K. G., "Realizing the Advantages of Organizational Interdependencies: The Role of Attributionally Mediated Emotions," in Martinko, M. J. (Ed.), *Attribution Theory: An Organizational Perspective*, St. Lucie Press, Delray Beach, Florida, pp. 253-271, 1995.
2. Arrington, C. E., *Attribution Theory and Expectation Gaps About Auditors*, Peat Marwick Mitchell Foundation, New York, New York, 1981.
3. Ashkanasy, N. M. and C. Gallois, "Leader Attributions and Evaluations: Effects of Locus of Control, Supervisory Control, and Task Control," *Organizational Behavior and Human Decision Processes*, Vol. 59, pp. 27-50, 1994.
4. Ashton, R., "An Experimental Study of Internal Control Judgments," *Journal of Accounting Research*, Vol. 12, Spring, pp. 143-157, 1974.
5. Ashton, R. and P. Brown, "Descriptive Modeling of Auditors' Internal Control Judgments: Replication and Extension," *Journal of Accounting Research*, Vol. 18, Spring, pp. 269-277, 1980.
6. Baron, R. A., "Attributions and Organizational Conflict: The Mediating Role of Apparent Sincerity," *Organizational Behavior and Human Decision Processes*, Vol. 41, pp. 111-127, 1988.
7. Barnett, D. J., *Attribution Biases, Competitive/Cooperative Work Environments, and the Management Control Process*, unpublished doctoral dissertation, University Microfilms International, Ann Arbor, Michigan, No. 50-09A, 1989.
8. Bernardin, H. J. and J. E. A. Russell, J. E. A., *Human Resource Management: An Experiential Approach*. McGraw-Hill, New York, New York, 1993.
9. Bonner, S., "Experience Effects in Auditing: The Role of Task-Specific Knowledge," *The Accounting Review*, Vol. 65, January, pp. 72-92, 1990.
10. Brown, C. and I. Solomon, "Configural Information Processing in Auditing: The Role of Domain-Specific Knowledge," *The Accounting Review*, Vol. 66, January, pp. 100-119, 1991.
11. Brunswick, E., "Representative Design and Probabilistic Theory in a Functional Psychology," *Psychological Review*, pp. 193-217, 1955.
12. Brunswick, E., *The Conceptual Framework of Psychology*, University of Chicago Press, Chicago, Illinois, 1955.
13. Chewning, E. and A. Harrell, "The Effect of Information Load on Decision Makers' Cue Utilization Levels and Decision Quality in a Financial Distress Decision Task," *Accounting, Organiza-*

- tions and Society, Vol. 15, No. 6, pp. 527-542, 1990.
14. Chi, M. T. H., Glaser, R. and M. J. Farr (Eds.), *The Nature of Expertise*, Lawrence Erlbaum Associates, Hillsdale, New Jersey, 1988.
15. Clapham, S. and C. Schwenk, "Self-Serving Attributions, Managerial Cognition and Company Performance," *Strategic Management Journal*, Vol. 12, pp. 219-229, 1991.
16. Cody, R. and J. Smith, *Applied Statistics and the SAS Programming Language*, Elsevier, New York, New York, 1991.
17. Eccles, R., "The Performance Measurement Manifesto," *Harvard Business Review*, January-February, pp. 131-137, 1991.
18. Farquhar, K., "Attributions and the Emergence of Leadership: Patterns in Employee Responses to Executive Succession," in Martinko, M. J. (Ed.), *Attribution Theory: An Organizational Perspective*, St. Lucie Press, Delray Beach, Florida, pp. 149-170, 1995.
19. Feldman, J. M., "Beyond Attribution Theory: Cognitive Processes in Performance Appraisal," *Journal of Applied Psychology*, Vol. 66, No. 2, pp. 127-148, 1981.
20. Fogarty, T. J. and L. P. Kalbers, "Internal Auditor Performance: A Comparison of Self-Ratings and Supervisor Ratings," *Managerial Auditing Journal*, Vol. 8, No. 4, pp. 22-26, 1993.
21. Greenberg, P. S., Greenberg, R. H. and H. Nouri, "Participative Budgeting: A Meta-Analytic Examination of Methodological Moderators," *Journal of Accounting Literature*, Vol. 13, pp. 117-141, 1994.
22. Hammond, K., McClelland, G. and J. Mumpower, J., *Human Judgment and Decision Making: Theories, Methods and Procedures*, Praeger, New York, New York, 1980.
23. Heider, F., *The Psychology of Interpersonal Relations*, Wiley, New York, New York, 1958.
24. Jones, E. E. and K. E. Davis, "From Acts to Dispositions: The Attribution Process in Person Perception," in Berkowitz, L. (Ed.), *Advances in Experimental Social Psychology*, Academic Press, New York, New York, Vol. 2, pp. 219-266, 1965.
25. Jones, E. E. and R. E. Nisbett, "The Actor and the Observer: Divergent Perceptions of the Causes of Behavior," in Jones, E. E., Kanouse, D. E., Kelley, H. H., Nisbett, R. E., Valins, S. and B. Weiner (Eds.), *Attribution: Perceiving the Causes of Behavior*, General Learning Press, Morristown, New Jersey, pp. 79-94, 1971.
26. Joyce, E., "Expert Judgment in Audit Program Planning," *Studies in Human Information Processing in Accounting, Supplement to Journal of Accounting Research*, Vol. 14, Supplement, pp. 29-60, 1976.
27. Kaplan, R. and D. Norton, "Using the Balanced Scorecard as a Strategic Management System," *Harvard Business Review*, January-February, pp. 1-15, 1996.
28. Kaplan, R. and D. Norton, "The Balanced Scorecard - Measures that Drive Performance," *Harvard Business Review*, January-February, pp. 71-79, 1991.
29. Kaplan, S. E., Reckers, P. M. and S. J. Roark, "An Attribution Theory Analysis of Tax Evasion Related Judgments," *Accounting, Organizations and Society*, Vol. 13, No. 4, pp. 371-379, 1988.
30. Kaplan, S. E., Reckers, P. M. and K. D. Reynolds, "An Application of Attribution and Equity Theories to Tax Evasion Behavior," *Journal of Economic Psychology*, Vol. 7, No. 4, pp. 461-476, 1986.
31. Kauffman, N. L., *Performance Evaluation and Job-Directed Effort in the CPA Firm: An Integration of Expectancy Theory, Attribution Theory, and Need Theory*, unpublished doctoral dissertation, University Microfilms International, Ann Arbor, Michigan, No. 49-09A, 1988.
32. Kelley, H. H., "Causal Schemata and the Attribution Process," in Jones, E. E., Kanouse, D. E., Kelley, H. H., Nisbett, R. E., Valins, S. and B. Weiner (Eds.), *Attribution: Perceiving the Causes of Behavior*, General Learning Press, Morristown, New Jersey, pp. 151-174, 1971.
33. Kelley, H. H., "Attribution Theory in Social Psychology," in Levin, D. (Ed.), *Nebraska Symposium on Motivation*, University of Nebraska Press, Lincoln, Nebraska, pp. 192-238, 1967.
34. Kelley, H. and J. Michela, "Attribution Theory and Research," *Annual Review of Psychology*, Vol. 31, pp. 457-501, 1980.
35. Libby, R., *Accounting and Human Information Processing: Theory and Applications*, Prentice-

- Hall, Englewood Cliffs, New Jersey, 1981.
36. Lord, R. G., "An Alternative Perspective on Attributional Processes," in Martinko, M. J. (Ed.), *Attribution Theory: An Organizational Perspective*, St. Lucie Press, Delray Beach, Florida, pp. 333-350, 1995.
 37. Lord, R. G., "An Information Processing Approach to Social Perceptions, Leadership and Behavioral Measurement in Organizations," *Research in Organizational Behavior*, Vol. 7, pp. 87-128, 1985.
 38. Lord, R. G. and K. Maher, *Leadership and Information Processing: Linking Perceptions and Performance*, Unwin Hyman, Boston, Massachusetts, 1991.
 39. Lord, R. G. and K. Maher, "Alternative Information Processing Models and Their Implications for Theory, Research and Practice," *Academy of Management Review*, Vol. 15, No. 1, pp. 9-28, 1990.
 40. Maher, K. J., "The Role of Cognitive Load in Supervisor Attributions of Subordinate Behavior," in Martinko, M. J. (Ed.), *Attribution Theory: An Organizational Perspective*, St. Lucie Press, Delray Beach, Florida, pp. 193-209, 1995.
 41. Maher, M. *Cost Accounting: Creating Value for Management, Fifth Edition*, McGraw-Hill, Chicago, Illinois, pp. 685-694, 1997.
 42. Martinko, M. J., "The Nature and Function of Attribution Theory Within the Organizational Sciences," in Martinko, M. J. (Ed.), *Attribution Theory: An Organizational Perspective*, St. Lucie Press, Delray Beach, Florida, pp. 7-14, 1995.
 43. Martinko, M. J. and W. L. Gardner, "Learned Helplessness: An Alternative Explanation for Performance Deficits," *Academy of Management Review*, Vol. 7, No. 2, pp. 195-204, 1982.
 44. McDonald, D. M., "Fixing Blame in N-person Attributions: A Social Identity Model for Attributional Processes in Newly Formed Cross-Functional Groups," in Martinko, M. J. (Ed.), *Attribution Theory: An Organizational Perspective*, St. Lucie Press, Delray Beach, Florida, pp. 273-288, 1995.
 45. Murphy, D. S. and T. S. Wetzel, "Education and Changes in Students' Causal Attributions of Auditor Independence," *Accounting Educators Journal*, Vol. 5, No. 1, pp. 95-108, 1993.
 46. Nisbett, R. E. and L. Ross, *Human Inference: Strategies and Shortcomings of Social Judgment*, Prentice-Hall, Englewood Cliffs, New Jersey, 1980.
 47. Schiff, A. D., *An Exploration of the Use of Financial and Nonfinancial Measures of Operating Performance by Executives in a Service Organization*, unpublished doctoral dissertation, University Microfilms International, Ann Arbor, Michigan, No. 9316299, 1993.
 48. Shields, M. D. "Understanding the Management Control Process via Attribution Theory," *Collected Papers of the 1977 Annual Meeting*, American Accounting Association, Sarasota, Florida, pp. 323-341, 1978.
 49. Simon, H., *Models of Man: Social and Rational*, Wiley, New York, New York, 1957.
 50. Weiner, B., "Searching for the Roots of Applied Attribution Theory," in Graham, S. and V. S. Folkes (Eds.), *Attribution Theory: Applications to Achievement, Mental Health and Interpersonal Conflict*, Lawrence Erlbaum Associates, Hillsdale, New Jersey, pp. 1-13, 1990.
 51. Weiner, B., *An Attributional Theory of Motivation and Emotion*, Springer-Verlag, New York, New York, 1986.
 52. Weiner, B., "A Theory of Motivation for Some Classroom Experiences," *Journal of Educational Psychology*, Vol. 71, pp. 3-25, 1979.
 53. Weiner, B., Frieze, I., Kukla, A., Reed, L., Rest, S. and R. S. Rosenbaum, "Perceiving the Causes of Success and Failure," in Jones, E. E., Kanouse, D. E., Kelley, H. H., Nisbett, R. E., Valins, S. and B. Weiner (Eds.), *Attribution: Perceiving the Causes of Behavior*, General Learning Press, Morristown, New Jersey, pp. 95-121, 1971.
 54. Wolk, C. M., *Causal Attributions for Performance: Implications for Auditor Turnover*, unpublished doctoral dissertation, University Microfilms International, Ann Arbor, Michigan, No. 54-05A, 1993.