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Running head: The influence of feedback framing

ABSTRACT

Tested the hypothesis that the way in which performance feedback was framed would influence organizational decision-making and performance through the mediation of self-regulatory mechanisms. Subjects served as managerial decision makers in a computerized simulation of a manufacturing organization in which they were required to assign employees to a variety of tasks. Subjects also selected goals, supervisory feedback, and social rewards for their employees. Subjects received veridical feedback concerning their performances framed either as deficits from a difficult standard or as gains toward that standard. The deficit-framed condition resulted in an erosion of managerial self-efficacy, lower satisfaction, increasingly lower self-set goals, erratic use of analytic strategies and culminated in lower organizational performance. Mastery-framing produced stable percepts of managerial self-efficacy, higher levels of satisfaction, increasingly challenging goal-setting, and continuously enhanced the systematic use of analytic strategies. These self-regulatory factors sustained organizational performance at a level significantly above that of the deficit-framed condition. Path analysis revealed that prior performance, perceived self-efficacy, self-satisfaction, and analytic strategies mediated the influence of the framing upon organizational performance.

Organizational managers are continually involved in decision making and in motivating and directing others to accomplish either organizational or individual goals (Kotter, 1982; Mintzberg, 1973; Stewart, 1967). In today's complex business environments, managers must evaluate and integrate information from a variety of sources and must understand how their decisions affect the motivation and performance of others. To complicate matters further, such managerial decision-making must be carried out within a dynamic environment, consisting of continual streams of information. Moreover, decisions made at one point influence the options available for later decisions and can have diverse consequences as environments change (Wood & Bailey, 1985).

Social cognitive theory provides a predictive and explanatory framework for the analysis of human behavior and motivation in complex dynamic environments (Bandura, 1986; 1988). The theory accords a central role to cognitive factors as guides and motivators of human behavior. Unlike unidirectional environmental models or unidirectional dispositional models, social cognitive theory posits a model of triadic reciprocal causation. In triadic reciprocity, behavior, cognitive and other personal factors, and the environment all operate on each other interactively.

Social cognitive theory posits that self-regulation is accomplished by several factors operating in concert. Applications of social cognitive theory to organizational decision making have analyzed how these self-regulatory factors operate within the triadic causal structure. There are four self-regulatory factors that are especially influential in the self-regulation of action. These are perceived self-efficacy, personal goal setting, affective self-reaction, and analytic thinking.

Perceived self-efficacy is people's beliefs in their ability to mobilize the motivation and resources needed to achieve given levels of performance. Evidence from many lines of research reveal that self-efficacy can have diverse psychological effects that can facilitate or impair complex decision making (Bandura & Jourden, 1991; Bandura & Wood, 1989; Wood & Bandura, 1989b). Self-efficacy beliefs regulate level of motivation directly through control of effort and indirectly by influencing goal-setting processes (Bandura, 1988; Bandura & Jourden, 1991; Bandura & Cervone, 1983, 1986). The stronger the perceived self-efficacy, the more challenging the goals people set for

themselves and the stronger is their commitment to them (Locke & Latham, 1990; Wood & Bandura, 1989a).

Self-efficacy beliefs also influence both cognitive and attentional processes in self-aiding or self-hampering ways. A strong sense of efficacy fosters a problem-solving focus on how to manage challenges. In contrast, a weak sense of efficacy activates a focus on personal deficiencies and potential adverse consequences (Bandura, 1989). Such intrusive thinking can undermine effective use of cognitive capabilities by diverting attention from how best to meet challenges to concerns over personal deficiencies and the consequences arising from such deficiencies (Lazarus & Folkman, 1984; Meichenbaum, 1977; Sarason, 1975).

The capacity to bring self-influence into play by adjusting personal goals provides a second self-regulatory mechanism. Converging lines of evidence confirm that clear and challenging goals enhance performance (Locke & Latham, 1990; Mento, Steel, & Karren, 1987). However, the decisions that managers make are not directly linked to organizational performance. Instead, in organizational activities, managers must achieve goals through the direction and coordination of group members. Changes in performance often do not produce immediate gains but must accrue over time to provide results (Bandura & Wood, 1989; Wood & Bandura, 1989b). Thus the influence of goal setting on group performance is much more complex than that at an individual level.

Affective self-reaction is a third self-regulation factor. This process involves individuals evaluating their accomplishments in comparison with their goals. Perceived negative discrepancies between desired goals and actual performance increases effort. Affective self-reactance can exercise influence in two ways, proactively through goal setting and reactively through attempts to lessen performance/goal discrepancies. Negative self-reaction increases effort in those activities in which effort and persistence alone can produce desired results (Bandura & Cervone, 1983, 1986; Locke, Cartledge, & Knerr, 1970). However, negative self-reaction can disrupt highly complex cognitive and attention-demanding activities (Bandura & Jourden, 1991; Cervone, Jiwani, & Wood, 1991).

A fourth self-regulatory factor, analytic thinking, also plays a key role in

organizational decision making. Decision makers in organizational environments must discover the rules that enable them to predict and effectively manage collective efforts. To do this, managers must evaluate and process large quantities of complex and often ambiguous and incomplete information. This task is complicated because few rules are directly and consistently linked to future performance but are linked in a interactive and probabilistic manner. Therefore, to discover the optimal performance rules, they must first isolate predictive factors and test their predictive value through systematic variation. If they alter many factors simultaneously, they will be unable to ascertain which factor was responsible for performance changes. Therefore, the optimal strategy is to alter selected factors systematically and observe resultant effects.

It is exceedingly difficult to experimentally study these mediating mechanisms within actual organizations. However, Wood and Bailey (1985) have devised a computer simulation of an organization in which relevant variables can be systematically varied and their influence on decisional processes and the mediating mechanisms thought which they work can be identified.

In this simulation, the three major interactants of triadic causation (cognitive, behavioral and environmental) are measured. The cognitive factor is measured by perceived self-efficacy, personal goal setting, reactive self-evaluation and the quality of subjects' analytic thinking. The decisions which subjects make represent the behavioral determinant and the properties of the simulated organization itself, such as the level of challenge and responsiveness of the organizational environment to subjects' decisions, represent the environmental element. The simulation therefore embodies the complexity of actual organizational decision making. Under these more difficult and interactive conditions, self-regulative, affective and motivational factors influence the quality of decision making much as they do in real-life organizational performance.

A series of studies, using the computer simulation, have been reported in which decision making has been studied as a function of experimentally-induced cognitive sets that can affect the self-regulatory. For example, managers who were led to believe that complex decision making is an inherent aptitude, that organizations are not easily controllable, that other managers perform better than they do, exhibit declines in the self-

regulatory factors and progressive deterioration of organizational functioning (Bandura & Jourden, 1991; Bandura & Wood, 1989; Wood & Bandura, 1989). In the contrasting conditions in these experiments, managers were led to believe that complex decision making is an acquirable skill, that organizations are influenceable, that they were improving their performance relative to a comparison group of managers. Managers operating under these cognitive sets displayed resilient self-efficacy, set challenging organizational goals, used effective
analytic strategies, and achieved high organizational attainments. Path analyses confirmed the causal ordering of the self-regulatory determinants of organizational performance (Wood & Bandura, 1989).

The major purpose of this research was to examine how framing influences bias the self-regulatory factors and organizational performance. Several studies, using simpler tasks, have shown that self-efficacy judgments can be biased by anchoring and availability influences and that these biases in self-efficacy judgments affect performance (Cervone, 1989; Cervone & Peake, 1986; Peake & Cervone, 1989). The influences of the anchoring and availability factors on task persistence was mediated entirely through their effects on perceived self-efficacy.

One cognitive bias that has been identified as operative in decision making is that of framing. Results can be framed or described in different ways utilizing different points of reference (Tversky & Kahneman, 1981; 1984). Studies of framing influences reveal that the value curve is steeper for losses than for gains, therefore "losses loom larger than gains" (Tversky & Kahneman, 1981).

Losses can be seen as deficits from a goal while gains can be seen as steps toward goal mastery. In the organizational simulation studies, decisional outcomes are reported as a percentage of the optimal standard. The same result can be framed using different points of reference. If performance attainments are framed as a shortfall from the goal, such a deficit should loom larger than one which is framed as a gain toward goal mastery. For example, an outcome of 70% of the standard can be reported to the subject as either a deficit from the standard (30% short of the standard) or as a gain toward mastery (70% of the goal). Those in the *deficit*-framed condition should perceive their discrepancy from a

goal as larger than those in a *mastery*-framed condition.

The present experiment was designed to test the specific hypothesis that *mastery* framing, which highlights personal accomplishment, would enhance perceived managerial self-efficacy, raise organizational goals, engender greater self-satisfaction, and lead to more efficient analytic thinking. *Deficit* framing highlights personal deficiencies. The larger the shortfall, the more diagnostic it would be of a lack of the requisite abilities. It was therefore predicted that deficit framing would undermine managerial self-efficacy, lower organizational ambition, generate self-dissatisfaction, and impair analytic thinking. These changes in self-regulatory determinants were predicted to produce differential organizational attainments so that managers in the mastery-frame condition would significantly outperform those in the deficit-frame condition.

According to the proposed model of the causal structure being tested in this study, perceived self-efficacy would enhance organizational performance both directly and indirectly through its effects on personal goal setting, use of analytic strategies, and affective self-reactions. Both personal goal setting and self-reactions would be influenced by prior performance and level of perceived self-efficacy. High self-set goals and self-satisfaction would, in turn, contribute to organizational performance.

Method

Subjects

The subjects were 26 male and 36 female advanced students from an undergraduate program in business studies. They ranged in age from 18 to 29 with an average age of 20.3 years. Seventy-six percent of the subjects had prior business experience, and 23 percent of them had prior management experience. The subjects were randomly assigned, balanced for gender, to the two experimental conditions, involving either *mastery* or *deficit* feedback framing.

Simulated Organization

The study was presented to the subjects as part of a program of research designed to advance understanding of managerial decision making. They were told that they would

serve as managers of a simulated organization modeled after an actual organization that had been observed over an extended period. To ensure that all participants received the same information, all the instructions were presented on their computer monitor. The orienting information described the simulation as one in which managers receive weekly orders for the production of furniture items, along with a roster of available employees. The manufacture of the items in each of the weekly orders required 8 different production subfunctions, such as milling the timber, assembling the parts, staining and glazing the assembled frame, upholstering the furniture and preparing the products for shipment. Subjects managed the organizational unit for a total of 12 production orders, with each order representing a performance trial in the simulation. The orders required producing new units, repairing old ones and refurbishing antiques.

The subject's managerial task was to allocate 8 employees selected from a 10 member roster to the different production subfunctions in order to complete the work assignment within an optimal period. They were told that by matching employees' particular interests and skills to production requirements, they would be able to attain a higher level of organizational performance than if employees were poorly matched to subfunctions. To assist them in this decision task, subjects were given written descriptions of the effort and skill required for each of the production tasks and brief profiles of the characteristics of each member. These profiles described the workers' particular skills, experience, motivational level, their preference for routine or challenging work assignments, and the standards of their work quality. Here is the profile description of one of the employees: *"Jack is one of the firm's oldest employees. He has been a builder for most of his working life and has a wide range of woodworking skills. He has a distrust of 'those fancy new machines,' even though he is a competent lathe operator. Jack is usually happiest with non-technical, manual jobs. He is a perfectionist, with a fine eye for detail."*

Both the production subfunctions and the employee attributes were selected on the basis of extensive observation of actual manufacturing processes to ensure that the simulation closely approximated actual environments. Subjects were provided with the profiles at the beginning of the managerial task on the computer monitor and on a printed

list which remained available for reference at any time during the simulation.

In addition to allocating employees to subfunctions, subjects were informed that they had to make a set of decisions on how to use the various motivational factors to optimize the group's performance. Specifically, they had to decide how to use goals, instructive feedback, and social incentives to enhance the accomplishments of each employee. For each of these motivational factors, subjects had a set of options representing the types of actions that managers might take in an actual organization. A mathematical model was used to calculate the hours taken to complete a production order based on the adequacy of subjects' allocation of employees to subfunctions and their use of the three motivational factors. The group performance for each trial for the *mastery* and *deficit* conditions was reported to subjects as a percentage of a preset standard number of hours to complete each manufacturing order. This preset performance standard, which was based on information from a pretest of performance attainments on this task, was set at a level that was difficult to fulfill. A stringent normative standard was selected to ensure substandard performances required for the deficit feedback condition. Indeed, none of the subjects matched or exceeded the difficult standard. The logic of the simulation model and the decision options available to subjects is described next. A more detailed explanation of the mathematics and logic of the model has been presented elsewhere (Wood & Bailey, 1985).

In performing the managerial role, subjects had to allocate the employees to the various subfunctions for each manufacturing order. They were able to reassign them if they judged that a particular member was better suited for a different job assignment. After subjects allocated the employees to the different subfunctions for a given trial, they then assigned each employee a production goal from a set of options that included urging them to do their best or assigning them one of three specific goals set at, above, or below the established standard. A fifth option allowed them to set no production goal for an employee, if they judged that it would have a negative motivational effect. Goal assignments for employees, which were made at the beginning of each trial, influenced an employee's performance according to the calculations of the simulation model in the manner predicted by goal theory (Locke & Latham, 1990). Goals that present a moderate

challenge lead to higher performance than no goals or instructions to do one's best. However, repeated imposition of goals that exceeded an employee's prior performance at a level that rendered them unattainable, had a negative effect on performance after 2 consecutive trials. Continued imposition of unattainable goals will eventually lead to their rejection and diminished motivation. To enhance the performance of their organizational unit, subjects had to learn the decision rule for setting the optimal level of challenge for each member.

Subjects were able to provide instructive feedback and social incentives to their worker group after each order was completed. The feedback and reward decisions, which influenced performance on the subsequent trial, modeled the temporal effects of such actions in actual organizational environments. For the feedback decision, subjects could give employees no feedback or select one of three options, which varied in the amount of direction given regarding procedures of production and analysis of difficulties. Instructive feedback had a positive effect on performance for employees who performed below the established standard. When an employee performed above standard, the continued use of high directive feedback on three or more trials was regarded as over-supervision that had a negative effect on performance. Effective use of the feedback options to improve organizational performance required subjects to learn decision rules for the optimal adjustment of the level of instructive guidance to performance attainments.

For decisions regarding social incentives, the effects of the three options varied with the type of reward given (e.g., compliment, social recognition, note of commendation), and with the degree to which rewards were contingent on employees' performance attainments. Subjects also had the option of not making any laudatory comments regarding their employees' work. Social rewards had a positive effect on performance. However, in an organizational setting the impact of rewards on performance is affected by social-comparison processes as well. Therefore, the magnitude of the incentive effect for a given member depended on the ratio of rewards to attainments for that employee compared to the equivalent ratio for other employees. Subjects, therefore, had to learn a compound decision rule combining incentive and equity factors to create an equitable system of incentive motivation.

In sum, to optimize performance of the organization which the subjects managed, they had to match employee attributes to job subfunctions, and master a complex set of decision rules on how best to guide and motivate their supervisees. To discover the rules, they had to test options, cognitively process the outcome feedback information of their decisional actions, and continue applying analytic strategies in ways that revealed the governing rules. The subjects were informed that they would receive feedback on how well their group had performed at the end of each production order. They were able to use this information to adjust their decisions so as to improve their group's level of performance.

Simple task demands reduce the impact of psychosocial influences on self-regulative factors because successes come easily to all performers. However, more complex organizational environments present difficult decisional demands that, over time, tend to activate motivational, affective and other self-referent processes in a flow of activities. Thus, highly complex tasks place heavier demands on effective use of self-regulative influences for competent functioning. Therefore, the present experiment used a high level of organizational complexity (Wood, Bandura, & Bailey, 1990), in which subjects had to make 32 decisions per production trial with several tradeoffs in allocations of employees to production subfunctions.

Subjects performed the simulation at a computer and entered all of their decisions on the computer keyboard. After subjects demonstrated that they understood how to use the computer keyboard, the experimenter left them. On each trial, subjects received information about the production order for that week as well as the roster of available employees.

Differential Framing Influence

Following each production trial, subjects received veridical feedback regarding their group's performance attainments. The differential framing influences were embedded in the feedback information. In instance, the mastery and deficit feedback was factually equivalent but differed in whether it was presented as progress toward the standard or as a shortfall from the standard. For example, if a subject achieved 80% of the standard, the

mastery feedback focused on the 80% gain already achieved. The deficit feedback focused on the 20 percent shortfall from the standard. On each of the trials, subjects in the *mastery frame* had their feedback couched in terms of degree of progress. Those in the *deficit frame* had their feedback couched in terms of how far they were from the standard.

A control condition devoid of any performance feedback was not included in the design because such a condition would reduce the repeated multifaceted decision making to a meaningless ritual. On each production trial, subjects had to make 20 decisions. In the absence of any feedback as to how their organization was performing, subjects would have no meaningful basis for assigning employees to tasks or for altering the levels of goals they set for them, the amount of supervision they provided them, and the amount of social commendation they bestowed upon them. To require subjects to continue making a large number of decisions over and over again without knowing how their group was doing would have led them to either cease making any changes after a while, or to resort to random variation to combat their boredom. Data from such a condition would not provide a meaningful comparative baseline. However, the first production trial provides a measure of the level of organizational performance subjects were able to achieve before they received any feedback. It serves to verify the initial equivalence of the groups.

All data were collected in the context of the simulation, which included a total of 12 trials. The scales for the different self-regulatory measures were presented on the monitor following trials 4, 8 and 12. Subjects recorded their responses on the computer keyboard.

Mediating Self-Regulative Determinants

The first assessment of the self-regulatory factors was performed after the 4th trial so that subjects had some familiarity with the simulation before being asked to judge their perceived efficacy and to set goals for themselves. The subsequent assessments were conducted after the 8th and 12th trials. The scales measuring these factors appeared on the computer terminal at the appropriate times. Subjects recorded their responses on the computer keyboard.

Perceived self-efficacy was recorded on a multi-item efficacy scale that described

nine levels of production attainments, ranging from 30% better to 40% worse than standard production time. Subjects rated the strength of their perceived self-efficacy that they could get the group they were managing to perform at each of the levels described. The ratings were made in terms of a 9-point scale ranging from no confidence at all, to intermediate levels of confidence, to total confidence. The strength of perceived self-efficacy was the sum of the confidence scores for the nine levels of organizational performance.

In assessing *self-set goals*, subjects recorded the level of organizational performance they were personally aiming for in the succeeding block of trials. They selected their personal goals from nine levels of possible organizational attainments ranging from 40% below to 30% above the preset level. They also rated their commitment to their goals using a 9-point scale that ranges from not at all committed to very strongly committed with 5 as an intermediate level.

In measuring *self-evaluative reactions*, subjects rated on a 9-point scale how self-satisfied they were with the group performance they achieved in the prior production order. Five was the neutral anchor point, with 9 representing the high self-satisfaction anchor point and 1 the low self-satisfaction anchor point on the scale.

The adequacy of subjects' *analytic strategies* was derived from their decisions regarding job assignments and how they varied the motivational factors to discern the managerial rules across each block of trials. Changing more than one factor concurrently for a given employee was a deficient analytic strategy for testing hypotheses regarding the impact of motivational factors on performance because it confounded the contribution of factors to outcomes. Systematic analytic strategies required changing one factor at a time and evaluating the effects such a change produced. Five systematic tests, one for each employee, could have been made in each trial. The strategy score was the sum of the decisions across a block of trials in which subjects changed only one factor (i.e., job allocation, goal level, instructive feedback or social reward) for each person. The more factors the subjects changed concurrently for each individual, the more erratic was their analytic thinking.

Organizational Performance

Organizational performance was measured in terms of the total number of hours taken by the group of employees to complete each weekly order. The number of production hours for each trial was automatically calculated by the simulation model based on the subjects' job allocations and selections of motivational factors (Wood & Bailey, 1985). The fewer the production hours the better was the managerial decision-making by the subject. Levels of organizational performance attained by subjects were reported as percentages of the preset standard, with a higher score indicating better performance. Organizational performance scores were averaged across 3 blocks of 4 trials each.

Results

The first production trial indicates the initial level of decision making capability because it occurs prior to the receipt of the framed feedback. The mean performance levels were 14.0% and 13.6% short of the preset standard for the mastery and deficit feedback conditions, respectively. Thus, the groups were equivalent in their initial level of organizational attainment, $t(60)=.10$, *ns*.

Impact of Framing on Self-Regulatory Factors

The impact of framing influence on the self-regulatory factors was analyzed by a 2 x 3 analysis of variance (ANOVA) with the framing condition as the between-subjects variable and phase of assessment as a repeated measures variable. Because there were no gender differences on any of the measures, the data for males and females were pooled. The differences between subsets of means were tested by the Newman-Keuls procedure.

Perceived Self-Efficacy. The mean strength of perceived self-efficacy as a function of the mastery or deficit frame at each of the three points of assessment is displayed in the left panel of Figure 1. Analysis of these data yielded a significant main effect for condition, $F(1,61)=6.65$, $p<.02$. Subjects who received performance feedback in terms of their gains exhibited a stronger sense of managerial efficacy than those whose feedback highlighted their deficiencies.

Insert Figure 1 about here

Affective Self-Evaluation. The mean affective self-reactions are shown in the right panel of Figure 1. The analysis of variance yielded a significant main effects for condition, $F(1,61)=34.20$, $p<.001$, for experiment phases, $F(1,61)=37.05$, $p<.0001$, and a significant interaction for the different conditions across phases, $F(1,61)=11.58$, $p<.0001$.

Subjects in the two conditions did not differ significantly in their self-satisfaction during the first phase but they diverged significantly at the second phase ($p<.01$) and the third phase ($p<.05$), with those in the mastery-framed condition expressing higher self-satisfaction with their performances.

Self-Set Goals. The levels of organizational goals subjects set across experimental phases under the different framing conditions are depicted in the left panel of Figure 2. The impact of the different framing conditions on the organizational goal setting yielded a significant interaction effect between phases and conditions, $F(1,61)=5.35$, $p<.01$.

Insert Figure 2 about here

Subjects who received the deficit feedback showed a progressive drop in goal level for their organizations so that by the third phase their productivity goals were significantly lower ($p<.05$) than in the first phase. This contrasted with subjects in the mastery condition who continuously raised their organizational goals so that their first phase productivity goals were significantly higher in both the second ($p<.03$) and third phases ($p<.02$).

Analytic Strategies. Inefficient use of analytic strategies involved changing multiple factors concurrently in an unsystematic effort to improve the organizational functioning. This contrasts with subjects who sought to discover the effective management rules by systematic variation of the motivational factors. Analysis of the data yielded a significant main effect for quality of analytic strategy use by phase, $F(1,61)=4.42$, $p<.02$,. This

result is displayed in the right panel of Figure 2.

Organizational Performance

The organizational performance attainments across phases of the experiment are presented in Figure 3. Feedback framing had a strong impact on the level of organizational attainment. The main effect was highly significant for both condition, $F(1,61)=9.51$, $p<.005$, and phases, $F(1,61)=20.15$, $p<.0001$. However, these results are qualified by a significant interaction between condition and phase, $F(1,61)=2.96$, $p<.03$.

Insert Figure 3 about here

Subjects in the mastery condition initially displayed an increase in their organizational performance, but, given the unreachable preset standard, in the final phase the subjects declined in performance to a level lower than both the first ($p<.05$) and second ($p<.05$) trial blocks. The organizational attainments of subjects who were given feedback framed as shortfalls, rapidly and progressively deteriorated. Their attainments in the second phase were marginally lower than in the first phase ($p<.10$) and third phase was significantly lower than the first and second phases ($ps<.01$).

In the intergroup comparison, the groups differed significantly in the first phase ($p<.05$), in the second phase ($p<.05$), and in the third phase ($p<.001$).

Path Analysis

A Path analysis was conducted to test the hypothesized causal ordering of the self-regulatory factors. The zero-order correlations and the standardized path coefficients significant beyond the .05 level are presented in Figure 4. The structure of the causal model, which has received support in a series of prior studies (Bandura & Jourden, 1991; Bandura & Wood, 1989; Wood & Bandura, 1989a), is described in the introductory section of this paper. The temporal sequencing of variables by experimental variation of factors also helps to remove ambiguity concerning the direction of causality. The full set

of structural equations representing the hypothesized causal relations were analyzed separately for the second and third trial blocks to measure any changes in the causal structure with growing experience.

Insert Figure 4 about here

The results of the path analysis reveal that in the second phase, prior performance alone was a significant predictor of subject performance attainments. However, in the third phase, performance attainments were also strongly influenced by self-regulatory factors. Perceived self-efficacy contributed to performance both directly and through its influence on self-satisfaction. Analytic strategies and self-satisfaction were also contributors to subsequent performance. As in the second phase, prior performance was a predictor of third phase performance.

The combined set of explanatory variables in the conceptual model accounts for a sizable share of the variance in organizational performance in both the second phase, $R^2=.77, p<.0001$ and the third phase, $R^2=.78, p<.0001$ of the study.

Discussion

The findings of this study provide supporting evidence that the way in which feedback is framed for factually equivalent performances impacts on the self-regulatory factors that have been shown to govern organizational decision-making and performance. Subjects receiving feedback in terms of deficits showed sharp declines in their perceived self-efficacy and were much more dissatisfied with their attainments. They increasingly lowered their goals for the organization they were managing. In contrast, subjects who received feedback as progress toward the standard sustained their belief in their managerial efficacy, set consistently higher goals for their organization, and were more self-satisfied with their performance attainments.

The divergent changes in the self-regulatory factors were reflected in the diverging levels of organizational productivity. Although subjects exhibited the same initial level of capability, those in the deficit-framed condition suffered substantial and continuous erosion

in their organizational attainments. Their comments in the post-experiment questionnaire testified to their growing sense of inefficacy, *"It was a good experience and seemed real but I felt that I did very poorly. I wanted to do much better. It was very depressing, my confidence in myself is very low right now."* The repeated focus on performance deficiencies not only instilled a sense of managerial inefficacy but an aversion to the activity itself: *"I found myself wanting to get to the end. It was frustrating and maddening. No fun at all. No matter what I did, I always fell more than 15 or 20 percent below the standard."*

Subjects who received their feedback framed in terms of goal mastery, sustained a belief in their managerial capability despite repeated failure to fulfill the stringent normative standard. *"I believe that I performed well, I was never perfect but I was getting as high as 75%."* The following comment illustrates how focus on gains enabled subjects to extract a sense of efficacy even from deficient performances: *"I think I did OK, I was above 60% on all of them. I feel that I was really beginning to understand it. I was trying little experiments to see what really made a difference and began to really understand how changing one thing made a difference in others."*

No gender differences were found in response to feedback. These findings differ from those of other studies showing that women are more influenced by feedback valence, be it positive or negative, than are men (Roberts, 1991; Roberts & Nolen-Hoeksema, 1989; 1990). Several factors might account for this discrepant finding. Previous studies used socially delivered arbitrary feedback, whereas in this study the feedback was objective and veridical. The nature of the samples also differs. Previous research relied heavily on college students. The participants in the present study were pursuing careers in various businesses. Women who pursue careers in predominantly male-dominated systems are probably better able to handle social feedback that is not always favorable. Occupational self-selection for lower vulnerability to the negative effects of unfavorable feedback would reduce gender differences.

Because of the highly difficult preset standard, none of the subjects fulfilled it. Consequently, all subjects had to cope with persistent failure. In an ongoing endeavor, individuals can view gains as positive indications of developing capability for eventual

success or construe their shortfalls as evidence of personal deficiencies. Mastery framing highlights self-efficacy in the face of shortfalls. An increase in perceived self-efficacy to acquire requisite competencies in an early phase of an endeavor supports subsequent self-directed efforts to master difficult challenges (Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987). In the present study, emphasizing the gains being made supported perceived self-efficacy, goal setting, and self-satisfaction despite repeated failure to fulfill the organizational standard. Repeated deficit framing can quickly undermine belief in one's efficacy to acquire the means to manage difficult environmental demands. Self-disbelief that one can learn to perform better can thus set in motion a cycle of self-demoralization.

The present study provides further evidence that achievement requires a strong and resilient sense of self-efficacy (Bandura, 1986; Bandura & Jourden, 1991; Wood & Bandura, 1989b). Because most accomplishments demand long term effort and perseverance, an efficacious outlook is necessary to sustain performance motivation, especially in those activities in which successes are rare but failure common.

Affective self-reaction has been shown to exercise divergent influence depending on the complexity of the activity. In simple tasks, where effort or persistence alone is sufficient to improve performance, discontent motivates increased effort (Bandura & Cervone, 1983; 1986). However, tasks which place a premium on complex cognitive functioning and attentional capacity are easily disrupted by negative affective self-reaction (Bandura & Jourden, 1991; Cervone, Jiwani, & Wood, 1991). The disruptive effect receives further support in the within-phase correlates of the present study. The greater the self-discontent, the poorer the subjects' performance in both the second phase, $r(60)=.31$, $p<.01$, and in the third phase, $r(60)=.56$, $p<.0001$. Such evidence suggests that self-dissatisfaction acted to disrupt task focus.

Subjects in the mastery feedback condition were initially conservative in that they set goals below the preset standard but as their sense of managerial self-efficacy increased, so did their aspirations for their organization. Subjects in the deficit feedback condition set moderate goals for their group initially but lowered them markedly under repeated reminders of their managerial deficiencies.

The results of this study are in accord with previous findings showing that goal setting often has a weaker impact on performance in socially-mediated attainments than in self-directed attainments (Bandura & Jourden, 1991; Bandura & Wood, 1989a). Increased personal effort alone does not guarantee improved group performance. Rather, managers must discover the best ways in which to motivate and direct the efforts of their groups. Because of the mediated link between goals and performance attainments, the motivational influence of group goal setting is less consistent in its effects than at the individual level.

The results of the path analyses support the hypothesis that self-regulatory factors have substantial influence on performance. By the third phase, the self-regulatory factors of self-efficacy, affective self-reaction and analytic strategies were influential in performance. Self-efficacy exerted its effect both directly and indirectly through self-satisfaction.

However, the findings are somewhat discrepant from the proposed causal model and from evidence from previous studies (Bandura & Jourden, 1991; Bandura & Wood, 1989; Wood & Bandura, 1989b). The primary difference involves a delay in the influence of the self-regulatory factors. The most likely explanation is the decreased number of trials in which these subjects participated. Because of the strong aversive effect of being constantly confronted with one's deficiencies, it was decided to reduce the number of trials by a third. Previous studies have shown that, as people form their sense of efficacy through growing experience, it exerts increasing influence on other self-regulatory factors and subsequent performance.

Another difference is that goal setting did not play an influential role in performance. Goals were not significantly linked to performance in any of the trial blocks. The most likely explanation for this result is the explicit focus on the preset standard in framing the feedback. Subjects' performances were constantly compared against the preset standard which became the performance target. This persistent focus indicated to subjects that they should regulate their efforts to fulfill the preset standard rather than any self-set standard. The constant focus on the preset standard would lead people to ignore their personal standard as a basis for regulating their efforts.

The findings of this research carry important implications given the ubiquitousness

of social evaluations. Performance feedback is prevalent in most everything people do. This study shows that the way in which feedback is socially framed or structured, has powerful effects on the quality of psychosocial functioning. It indicates that mastery framing can provide an inoculation against the adverse effects of persistent performance failings and sustain motivation under difficult circumstances.

Other research demonstrates that social comparison can have a detrimental effect on self-regulatory factors and performance (Bandura & Jourden, 1991; Fey & Ruble, 1990; Nicholls, 1990). Such research suggests that a focus on personal standards may help to offset the adverse effects of disadvantageous social comparison. The current research qualifies this principle. While the focus should indeed be on self-standards, it should be framed in terms of gains rather than shortfalls. Self-comparison which dwells on personal deficiencies would have a demoralizing effect.

The present findings, combined with those of prior studies, provide guidelines to enable people to manage constructively taxing environmental demands that do not lend themselves to easy successes. There are four strategies that support an efficacious orientation under such conditions. Self-efficacy and its concomitant effects can be progressively enhanced by construing ability as an acquirable skill (Wood & Bandura, 1989b), by adopting a cognitive set that social environments are influenceable (Bandura & Wood, 1989), by carefully choosing one's social referents (Bandura & Jourden, 1991), and by framing feedback in ways that give salience to the gains one is making. These combined influences can create strong resiliency to adversity.

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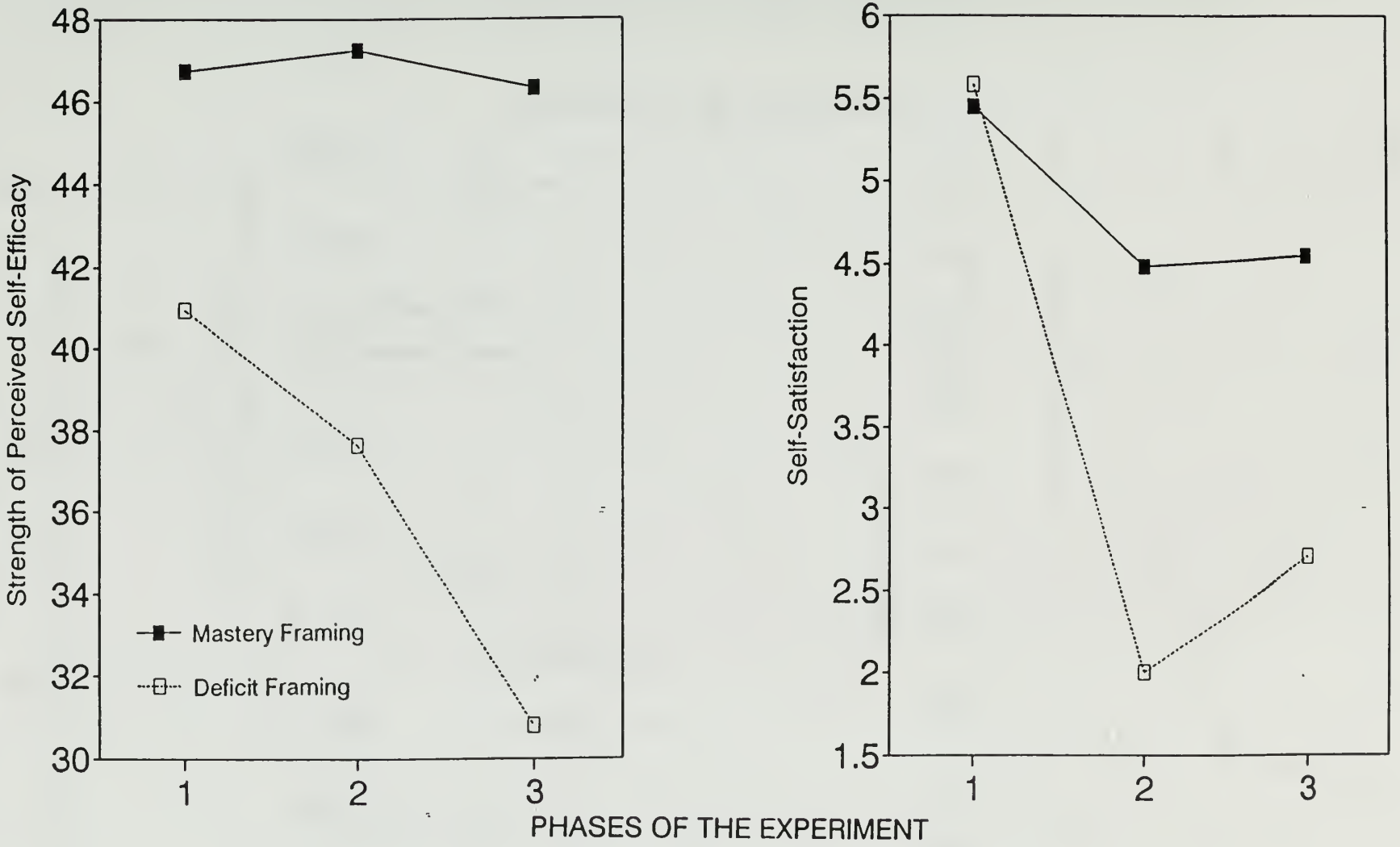
Figure Captions

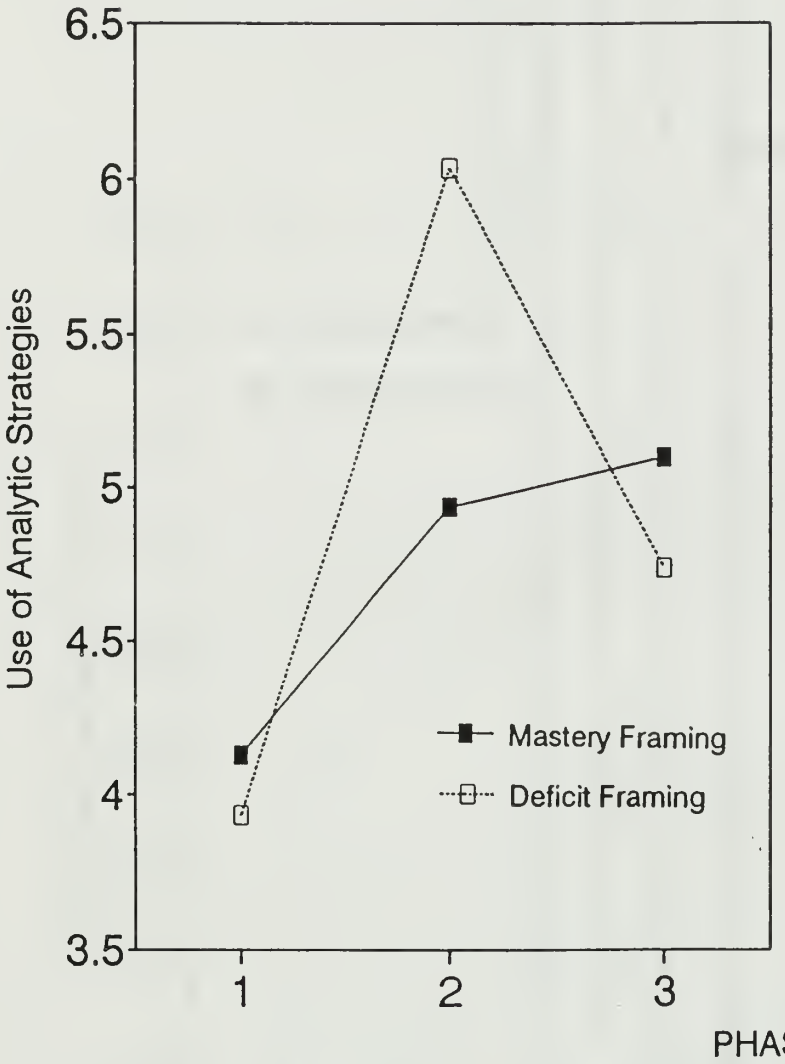
Figure 1. Changes in perceived self-efficacy and in affective self-reaction across successive stages of the experiment under the different framing conditions. (Each phase includes four different production orders.)

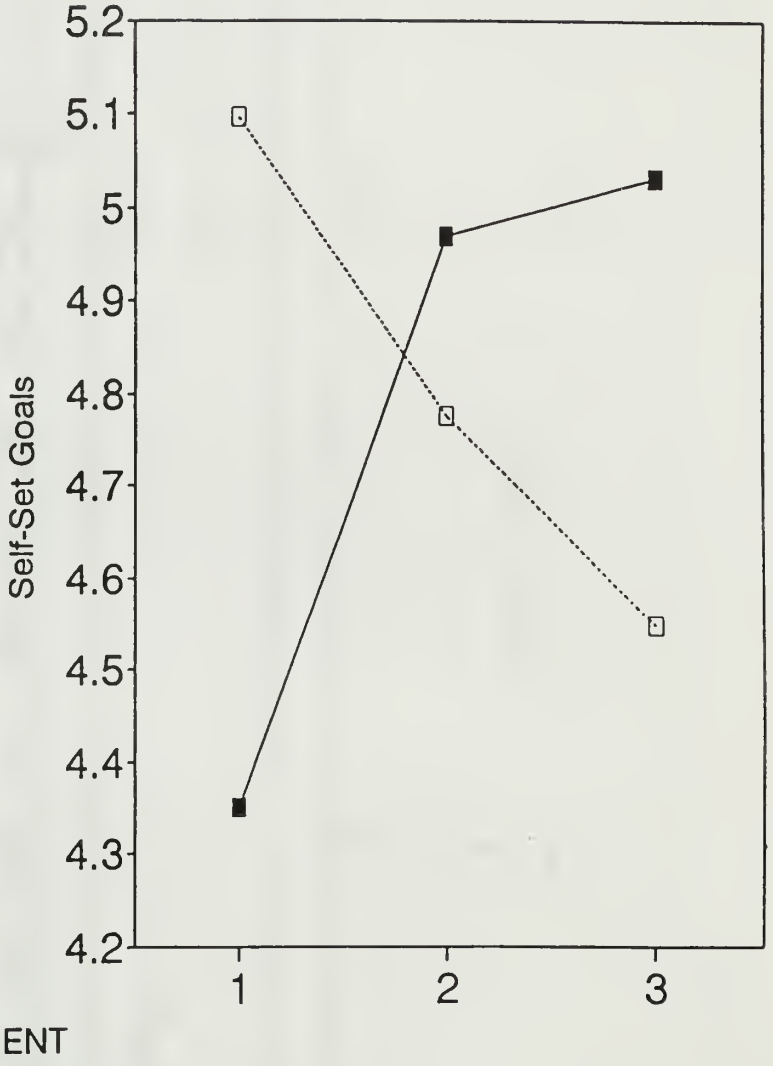
Figure 2. Changes in effective use of analytic strategies and goal setting across successive stages of the experiment under the different framing conditions. (Each phase includes four different production orders.)

Figure 3. Level of organizational attainment achieved across successive stages of the experiment by subjects who managed the simulated organization under the different framing conditions.

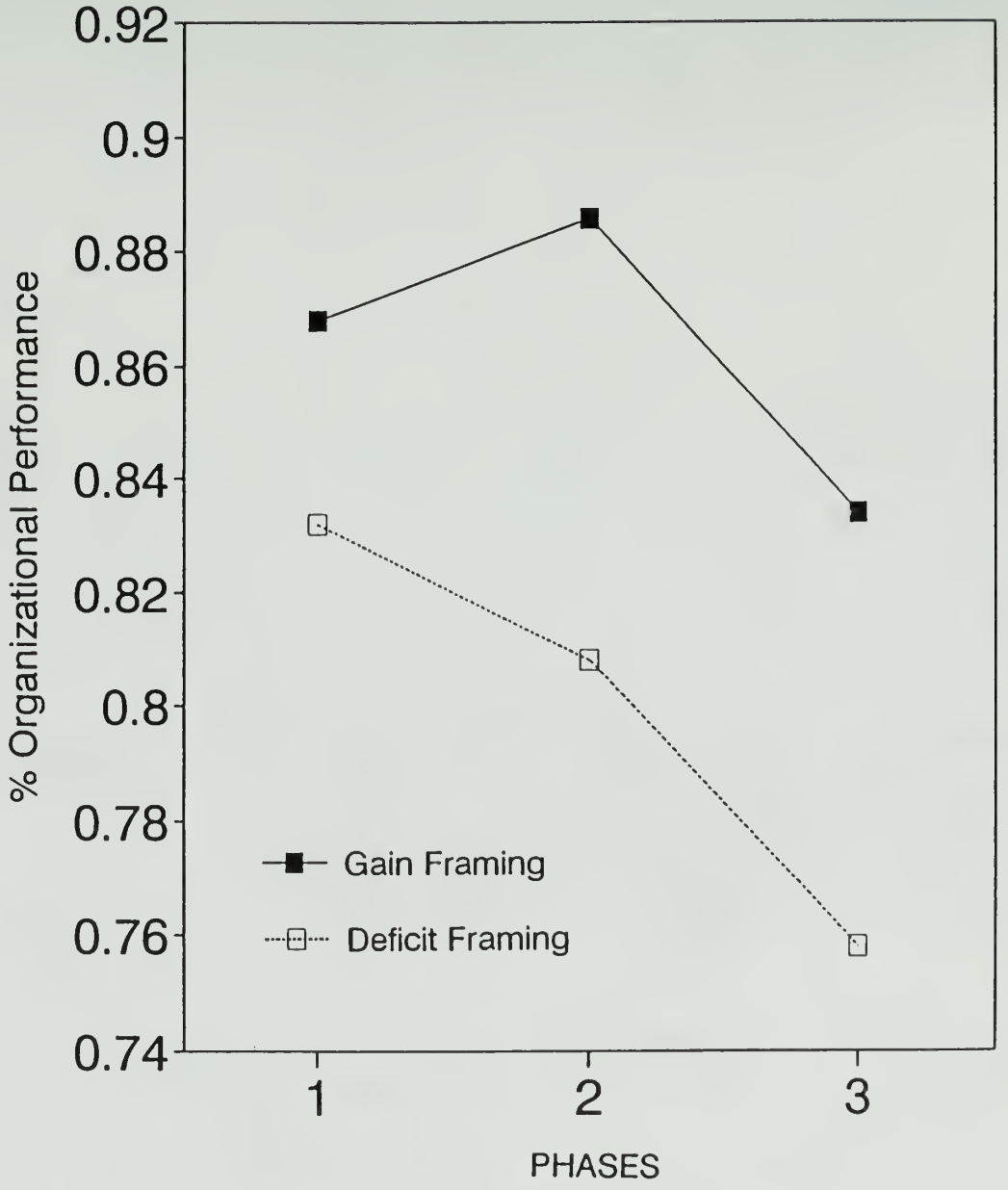
Figure 4. Path analysis of causal structures in the second and third phases of the experiment. (The initial numbers in the paths of influence are the significant standardized path coefficients, $ps < .05$; the numbers in parentheses are the first-order correlations. The network of relationships on the left half of the figure are for the second phase, and those on the right are for the third phase.)

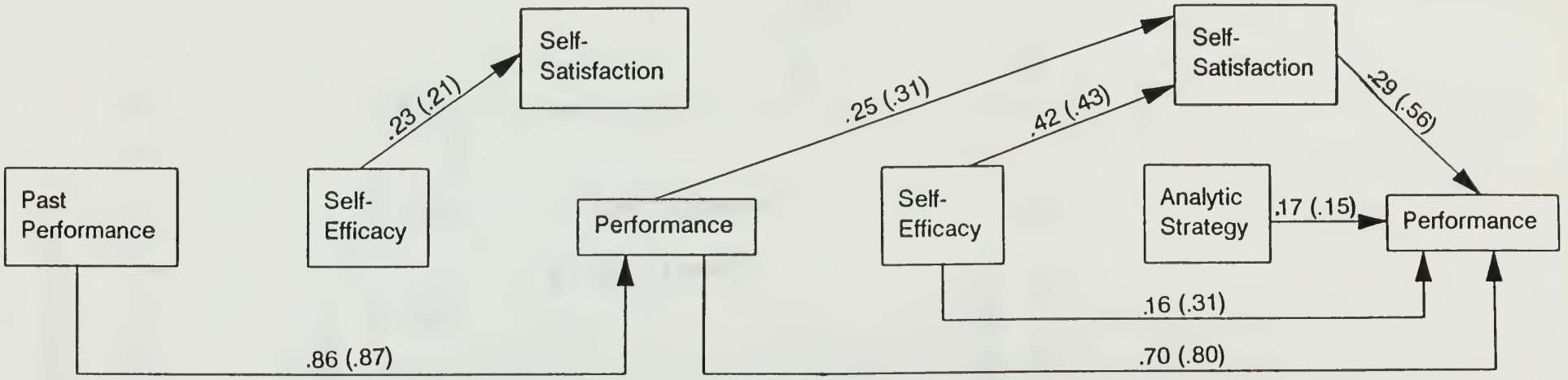

Strength of Perceived Self-Efficacy
48
46
44
42
40
38
36
34
32
30
Mastery Framing
Deficit Framing
1
2
3
Self-Satisfaction
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
2
3
PHASES OF THE EXPERIMENT





PHASES OF THE EXPERIMENT


0.92
0.9
0.88
0.86
0.84
0.82
0.8
0.78
0.76
0.74
% Organizational Performance
Gain Framing
Deficit Framing
1
2
3
PHASES


Past Performance
Self-Efficacy
Self-Satisfaction
Performance
Self-Efficacy
Analytic Strategy
Self-Satisfaction
Performance
.23 (.21)
.25 (.31)
.42 (.43)
.29 (.56)
.17 (.15)
.16 (.31)
.86 (.87)
.70 (.80)