Impact of Conceptions of Ability on Self-Regulatory Mechanisms and Complex Decision Making

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Tested the hypothesis that induced conceptions of ability as a stable entity or as an acquirable skill would affect self-regulatory mechanisms governing performance in a simulated organization. Ss served as managerial decision makers in which they had to match employees to subfunctions and to discover and apply managerial rules to achieve a difficult level of organizational performance. Those who performed the challenging managerial task under an entity conception of ability suffered a loss in perceived self-efficacy, lowered their organizational goals, and became less efficient in their analytic strategies. Ss who managed the organization under an acquirable skill conception of ability sustained their perceived self-efficacy, set challenging organizational goals, and used analytic strategies effectively. These divergences in self-regulatory factors were accompanied by substantial differences in organizational performance. Path analysis revealed that perceived self-efficacy had both a direct effect on organizational performance and an indirect effect through its influence on analytic strategies. Personal goals also affected organizational performance through the mediation of analytic strategies. The relation of prior organizational performance to subsequent performance was mediated entirely by the combined influence of the self-regulatory factors.

Complex decision making is, by its nature, a motivated, cognitive process. This is especially true in dynamic organizational environments. Decision making in such environments is an ongoing process that requires complex integration of multiple sources of information to produce distal, socially mediated outcomes (Mintzberg, 1973; Stewart, 1967). Because organizational outcomes must be achieved through the concerted efforts of others, some of the most important managerial decisions are concerned with how to use human talent and how to guide and motivate human effort. In executing this role, managers have to cope with numerous obstacles, failures, and setbacks that often carry perturbing self-evaluative implications as well as social consequences. These affective factors can undermine self-conceptions and motivation in ways that impair good use of decision-making skills. Effective decision making thus involves more than applying a set of cognitive operators to existing knowledge for desired solutions. Self-regulatory influences have considerable impact on how well cognitive-processing systems work (A. Bandura, 1986; Wood, Bandura, & Bailey, in press).

The mechanisms and outcomes of managerial decision making do not lend themselves readily to experimental analysis in actual organizational settings. The governing processes are usually influenced by a multiplicity of interacting factors that are difficult to identify and over which it is even more difficult to exercise experimental control. Advances in this complex field can be achieved by experimental analyses of decision making in simulated organizational environments. A simulated environment permits systematic variation of theoretically relevant factors and precise assessment of their impact on organizational performance and the psychological mechanisms through which they achieve their effects. Much of the research on human decision making involves single trial judgments in static environments (Beach, Barnes, & Christensen-Szalanski, 1986; Hogarth, 1981). Judgments under such conditions may not provide a sufficient basis for developing either descriptive or normative models of decision making in dynamic naturalistic environments that involve sequential judgments governed by learning and motivational mechanisms. By incorporating multiple trials in the simulated environment it is possible to examine temporal interdependencies and cumulative effects in decision-making processes (Wood & Bailey, 1985).

The conception of ability with which people approach complex activities is likely to have a significant impact on the self-regulatory influences that govern ongoing motivation and personal accomplishments in complex decision-making environments. Recent research has identified two major conceptions of ability to which people subscribe (M. Bandura & Dweck, 1987; Dweck & Elliott, 1983; Nicholls, 1984). In one perspective, they construe ability as an incremental skill that can be continually enhanced by acquiring knowledge and perfecting one’s competencies. People with this conception adopt a learning goal. They seek challenging tasks that provide opportunities to expand their knowledge and competencies. Errors are regarded as a natural, instructive part of an acquisition process. They judge ca-
pabilities more in terms of personal improvement than by comparison against the achievement of others.

In the contrasting perspective, ability is construed as a more or less fixed entity. This type of conception of ability heightens evaluative concerns about personal competence that can have diverse effects on cognitive functioning (Nicholls, 1984). Because performance level is regarded as diagnostic of intellectual capacity, errors and deficient performances carry personal and social evaluative threats. Therefore, people adopting the entity view tend to pursue performance goals of demonstrating their competence. They prefer tasks that minimize errors and permit ready display of intellectual proficiency at the expense of expanding their knowledge and learning new skills. High effort, which is often required to develop competencies in complex activities, also poses evaluative threats because high effort is taken as indicative of low ability. An entity conception of ability is less conducive to effective management of failure than is the view of ability as an incremental skill (Elliott & Dweck, 1988).

According to social cognitive theory (A. Bandura, 1986, 1988), self-regulation of motivation and performance attainment is governed by several self-regulatory mechanisms operating in concert. They include affective self-evaluation, perceived self-efficacy for goal attainment, and personal goal setting. Perceived self-efficacy refers to beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands. Self-beliefs of efficacy affect the challenges that are undertaken, the amount of effort expended in an endeavor, the level of perseverance in the face of difficulties, whether thinking patterns take self-aiding or self-impeding forms, and vulnerability to stress and depression.

Among the different modes of altering self-beliefs of efficacy, performance experiences are especially influential. Substandard performances are likely to carry markedly different diagnostic implications depending on whether ability is construed as an acquirable skill or as a relatively stable entity. When performances are viewed as skill acquisition in which one learns from mistakes, perceived self-efficacy is unlikely to be adversely affected by substandard performances. This is because errors become a normative part of any acquisition process rather than serving as indicators of basic personal deficiencies. In contrast, when performances are construed as being diagnostic of underlying cognitive capability, frequent experience of substandard performances can take a heavy toll on perceived self-efficacy.

Perceived managerial self-efficacy can influence organizational performance both directly and indirectly through its effects on personal goal setting and use of analytic strategies. The stronger the perceived self-efficacy, the higher the goals people set for themselves (A. Bandura & Cervone, 1986; Taylor, Locke, Lee, & Gist, 1984; Wood et al., in press) and the stronger the commitment to them (Locke, Frederick, Lee, & Bobko, 1984). The findings of diverse lines of research show that challenging goals enhance motivation and performance attainments (Latham & Lee, 1986; Locke, Shaw, Saari, & Latham, 1981; Mento, Steel, & Karren, 1987) especially if combined with performance feedback (A. Bandura & Cervone, 1983).

The multifaceted nature of managerial activities and their mazelike linkage to organizational performance introduces complexities in the relation between personal goals and group attainment (Wood et al., in press). In virtually all previous research, self-set goals are applied to personal performances over which individuals can exercise direct control by regulating their level of effort. In organizational environments, managerial goals must be socially mediated through the coordinated efforts of others. Sheer managerial effort alone does not ensure attainment of a collective goal. To complicate matters further, efforts to enhance the level of organizational functioning often require constituent changes in particular aspects of the social structure and the way in which social resources are allocated. Systematic pursuit of such operational subgoals contributes to eventual success but does not necessarily produce sizable gains in organizational performance in the short run (Wood et al., in press). So prediction regarding the performance-enhancing effects of goal challenges at the group level must be tempered by considerations of these complexities.

In complex decision-making environments, appropriate decision rules are discovered through systematic application of analytic strategies (Bourne, 1965; Bruner, Goodnow, & Austin, 1956; Wood et al., in press). Initially, performers must draw on their existing state of knowledge in constructing tentative composite rules for how various motivational factors may affect outcomes. The optimal value of these different factors must then be tested by varying them one at a time and assessing how they affect performance outcomes. Less skilled decision makers formulate vague composite rules, tend to alter several factors concurrently (making it difficult to assess the source of multiply produced effects), and make less effective use of informative outcome feedback.

Self-referent factors can affect how well analytic subfunctions for rule learning, such as hypothesis construction and testing and inductive reasoning, are executed. This is especially true in the acquisition of complex functional rules, which place heavy demands on efficient cognitive processing of multidimensional information (Wood et al., in press). In the formal characteristics of the present managerial task used in this study, subjects had to learn the form of the functions relating several motivational factors to aggregate outcomes. Some of the factors involved nonlinear and compound rules that are more difficult to learn than are linear ones (Brehmer, Hagafors, & Johansson, 1980). Moreover, they had to figure out the best way to integrate the set of rules and to apply them discernibly to each member of the group. To achieve all of this, they had to generate hypotheses about functional relations for different motivational factors, to test their judgments against outcome information, and to remember which of the hypotheses they had tested and how well they had worked.

It requires a strong sense of efficacy to deploy one's cognitive resources optimally and to remain task oriented in the face of repeated difficulties and failures. Those who judge themselves to be inefficacious in coping with environmental demands tend to become more self-diagnostic than task-diagnostic (M. Bandura & Dweck, 1987). They dwell on their personal deficiencies and cognize environmental demands as being more formidable than they really are. Such self-referent intrusive thinking creates stress and undermines effective use of capabilities by diverting attention away from how best to proceed to concerns over personal deficiencies and possible adverse outcomes (Lazarus & Launier, 1978; Meichenbaum, 1977; Sarason, 1975).
We designed this experiment to test hypotheses that conceptions of ability will influence achieved levels of organizational performance through their effects on the mediating self-regulatory mechanisms just described. Subjects engaged in managerial decision making in a simulated organization in which they had to match a set of employees to job requirements and to use goals, instructive feedback, and rewards in appropriate ways to achieve substantial gains in productivity that were difficult to fulfill. They performed the managerial task over a series of trials under instated conceptions of ability either as an acquirable skill that is improvable with practice or as a basic intellectual entity reflecting underlying cognitive capacities. At three points in the managerial simulation, we assessed subjects' perceived managerial self-efficacy and personal goals. We also measured the adequacy of their analytic strategies for discovering managerial rules and the level of organizational performance they achieved.

For reasons given earlier, we predicted that perceived managerial self-efficacy would be sustained under the conception of ability as an acquirable skill but impaired under the entity conception. We further predicted that perceived self-efficacy would enhance organizational performance both directly and indirectly by its effects on personal goal setting and on use of analytic strategies. The stronger the perceived self-efficacy, the more challenging the organizational goals subjects would set for themselves and the more systematically they would use strategies to discover the managerial rules. High self-set goals and systematic strategies would, in turn, enhance the level of organizational performance.

Method

Subjects

The subjects were 20 men and 4 women from a graduate program in business studies. Their average age was 26 years (SD = 3.16 years). Fifteen subjects had prior managerial experience. We randomly assigned subjects, balanced for sex, to the experimental conditions.

Simulated Organization

The study was presented to the subjects as a project in managerial decision making in which they would manage a simulated organization. The introductory 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 five 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 18 production orders, with each order representing a permutation model in the manner predicted by goal theory (Locke et al., 1981). 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 exceed an employee's prior performance at a level that renders them unattainable has a negative effect on performance after two trials. Continued imposition of unattainable goals would 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 employee.

Instructive feedback and social rewards were given after the production order for each trial had been 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 that varied in the amount of direction given regarding methods of workmanship and analysis of difficulties. Instructive feedback had a positive effect on performance for employees who were performing 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 oversupervision that would have a negative effect on performance. Effective use of the feedback options to improve organizational performance required subjects to learn decision rules for optimal adjustment of level of instructive feedback to performance attainments.

For decisions regarding social rewards, 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.
Induction of Conceptions of Ability

We instated the entity and acquirable skill conceptions of ability through the introductory instructions that subjects read before beginning the managerial simulation task. In the acquirable skill condition, subjects were told that decision-making skills are developed through practice. In acquiring a new skill, people do not begin with faultless performance. However, the more they practice making decisions the more capable they become. They were further told that the simulation task provided a vehicle for cultivating cognitive decision-making capabilities.

In the entity condition, subjects were told that decision making reflects the basic cognitive capabilities that people possess. The higher their underlying cognitive-processing capacities, the better is their decision making. Subjects were additionally told that the simulation provided a vehicle for gauging the underlying cognitive capacities. These differential conceptions of ability were embedded in instructions for the simulation task that otherwise were identical in every respect. Construal of decisional ability as a basic capacity that is revealable by level of performance is more likely to heighten concerns about personal competence than is construal of ability as an acquirable skill.

After subjects read the introductory information, the characterization of ability as a stable personal quality or as an acquirable skill, and the descriptive profiles of the employees and subfunctions, they performed the simulation at a computer terminal. They entered all of their decisions on the keyboard of a personal computer. After subjects demonstrated that they understood how to use the computer keyboard, the experimenter left the room. Subjects received information about the weekly production orders, the roster of available employees, and feedback on the organization's level of productivity on the computer screen. During the experiment, a timer emitted an audible beep every 5 min. Subjects were informed that the timer was provided to help them pace their progress rather than to time their decision making.

After the final trial, the experimenter gave subjects a full explanation of the nature and purpose of the study. They learned that they had performed the organizational simulation against a difficult performance standard.

All data were collected in the context of the simulation, which included a total of 18 trials. The scales for the different self-regulatory measures were presented on the monitor following Trials 6, 12, and 18. Subjects recorded their responses on the keyboard. The first assessment was conducted after the sixth trial so that subjects would have some experience with the simulation before being asked to judge their perceived efficacy and to set goals for themselves.

Mediating Determinants

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 of productivity described. The ratings were made in terms of a 10-point scale ranging from no confidence at all (1) to total confidence (10). 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 trials. They selected their personal goal from nine levels of possible organizational attainments ranging from 40% below to 30% above the established standard and from a tenth option of no particular goal.

We derived the adequacy of subjects' analytic strategies from their decisions regarding job assignments and how they varied the motivational factors to discern the managerial rules across each block of trials. The number of systematic tests that subjects carried out to determine how job allocations and motivational arrangements affected the performance of individual employees provided the measure of analytic strategy. The strategy score was the sum of the decisions across a block of trials in which subjects changed only a single factor (i.e., job allocation, goal level, instructive feedback, or social reward) for individual employees. Changing more than one factor concurrently for a given employee is a deficient analytic strategy for testing hypotheses regarding the impact of motivational factors on performance because it confounds the contribution of factors to outcomes. Systematic analytic strategies require changing one factor at a time. Five systematic tests, one for each employee, could be made in each trial. Therefore, a subject's analytic strategy score across a block of six trials could range from 0 to 30.

Another aspect of decision making is the subject's sheer level of decision activity, represented by the total number of factors changed for all employees in each trial without consideration of confounding variations. This is a quantity measure of decision-making activity, whereas systematic analytic strategy is a quality measure.

Organizational Performance

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

Results

Effects of Ability Conceptions on Self-Regulatory Factors

We analyzed the effects of the differential ability conceptions on self-regulatory factors using 2 x 3 analyses of variance (ANOVAs), with conception of ability as a between-subjects variable and assessment phase as a repeated measures variable. Figure 1 shows the mean strength of perceived managerial self-efficacy after each of the trial blocks. Subjects in the stable entity condition displayed a much less resilient sense of self-efficacy in the face of substandard organizational performances than those who regarded decision making as a skill that can be developed.
those in the stable entity condition displayed a progressive decline in perceived self-efficacy, whereas those in the acquirable skill condition maintained their sense of managerial efficacy. However, as they continued to try to fulfill the difficult production standard, their testing of managerial options, whereas those for whom errors implied basic cognitive deficiencies became less efficient, $F(2, 44) = 4.35, p < .05$.

As they continued to perform the task, subjects in the entity condition changed more motivational factors in their efforts to discover optimal motivators but did so in a confounding fashion that undermined opportunities to learn from the outcome feedback. Those in the acquirable skill condition made fewer but more systematic changes in motivational factors. The more production assignments the entity subjects had to manage, the more erratic they became in their strategic thinking. The interaction effect for sheer amount of changes was $F(2, 44) = 3.83, p < .05$.

**Organizational Performance**

In Figure 3, the mean organizational performance that subjects achieved is plotted as a function of conceptions of ability and blocks of production assignments. Subjects in both conditions performed below the preset standard of productivity. Both groups attained similar levels of performance in the early trials of organizational management and did not differ in this respect. However, as predicted from the postulated influence of self-regulatory dynamics, organizational performance was markedly impaired under the entity conception of ability, showing a steady decline across progressive blocks of trials. In contrast, those in the acquirable skill condition sustained a high level of organizational performance. The growing divergence in organizational performance produced a highly significant interaction between conceptions of ability and trial blocks, $F(2, 44) = 9.69, p < .001$. We turn now to the mediating effects of the various self-regulatory mechanisms and their contributions to organizational performance.

**Path Analysis**

We conducted path analyses to test the causal ordering of variables. The direction of causality in the path model is established by theoretical considerations supported by prior research and temporal sequencing of variables. In this causal model, prior performance influences perceived self-efficacy, personal goal setting, and subsequent performance. We included prior performance as the first variable in the analyses as a proxy for a host of possible determinants other than the self-regulatory influences examined in this study.

Performance attainments and self-regulatory factors involve bidirectionality of influence (A. Bandura, 1986). That is, self-influences are changed by performance experiences and subsequent level of performance is, in turn, altered by motivational self-influences, which represent nonability factors. As a result, using unadjusted performance scores when controlling for past performance will also remove effects that are attributable to the motivational effects of self-influences. When self-influences are autocorrelated, unadjusted control for past performance will also remove effects that are attributable to self-influences in the current performance. To avoid this overcorrection for past performance, the effects of perceived self-efficacy and self-goals at Phase 1 and strategy in Block 2 were removed from Block 2 performance, the effects of perceived self-efficacy and self-goals at Phase 1 and strategy in Block 2 were removed from Block 2 performance before it was introduced into the analyses for Block 3 performance. For the analyses of Block 2 performance, there was no prior measure of the self-regulatory influences that could be used to remove their effects from performance in Block 1. Therefore, the measure of past performance included
in analysis of Block 2 performance had only the prior effects for strategy removed.

Perceived self-efficacy was entered into the equation as a second predictor because beliefs about one's capabilities influence the goals people set for themselves and how proficiently they use analytic strategies. Perceived self-efficacy also contributes independently to performance. We expected personal goals to affect subsequent performance directly and indirectly through their influence on analytic strategies. The full set of structural equations representing the hypothesized causal relations were analyzed separately for Trial Blocks 2 and 3.

The standardized path coefficients that were significant at or beyond the .05 level are shown in Figure 4. In the second block of trials, the relation of prior organizational performance to subsequent performance was mediated entirely by perceived self-efficacy, personal goals, and analytic strategies. No significant relation was found between prior and subsequent organizational performance when the combined influence of the self-regulatory factors was controlled.

Perceived self-efficacy enhanced the level of organizational performance both directly and indirectly through its effects on analytic strategies. Prior organizational performance affected the goals subjects set for themselves. Personal goals, in turn, influenced performance by their impact on analytic strategies, but they did not contribute independently to organizational performance. Effective use of analytic strategies enhanced organizational performance after controlling for all prior determinants.

The structure of the significant causal relations was replicated in the third block of trials with the exception that personal goal setting dropped out as a mediating influence. The combined set of explanatory variables in the conceptual model accounted for a major share of the variance in organizational attainments in both the second trial block \((R^2 = .75, p < .001)\) and the third block \((R^2 = .78, p < .001)\).

Discussion

Our findings provide supporting evidence that the conception of ability with which people approach complex decision making has substantial impact on self-regulatory mechanisms that govern performance attainments. Construing ability as an acquirable skill fostered a highly resilient sense of personal efficacy. Although the challenging preset level of organizational performance eluded the subjects, they remained steadfast in their perceived managerial self-efficacy, continued to set for themselves challenging organizational goals, and used analytic strategies in ways that aid discovery of effective managerial decision rules. Such a self-efficacious orientation, which is well suited for handling adversity, paid off in uniformly high organizational attainments.

These findings are in accord with a growing body of evidence that human attainments and positive well-being require a strong sense of personal efficacy (Alloy & Abramson, 1979; A. Bandura, 1986; M. M. Bandura, 1987; Glasgow & Arkowitz, 1975; Lewinsohn, Mischel, Chaplin, & Barton, 1980). This is
Figure 3. Level of organizational productivity achieved across trial blocks by subjects who managed the simulated organization under an induced acquirable skill conception of decision-making ability or under an induced entity conception of ability.

because ordinary social realities are usually fraught with difficulties. People must, therefore, have a robust sense of personal efficacy to sustain the productive attentional focus and perseverance effort needed to succeed.

Construing ability as reflecting an underlying personal capacity greatly increased vulnerability to the adverse effects of failure. Viewed from this cognitive perspective, substandard performances become diagnostic of personal deficiencies rather than a natural, instructive element in the acquisition of competencies. The longer the subjects with the entity orientation managed the complex task, the more they were beset with doubts about their managerial efficacy. They kept lowering their organizational aspirations and achieving progressively less with the organization they were managing.

In this study we raised evaluative concerns about personal competence by the way in which complex decision making was socially construed. Other forms of social influence that focus attention on self-evaluation rather than on task mastery—such as valuational feedback, normative grading, competitive structures, and coercive incentive systems—can similarly have adverse effects on the level of interest, motivation, performance accomplishments, and creativity (Amabile, 1983; Butler, 1987; Nicholls, 1984; Ryan, 1982). The findings of this study further reveal the substantial impact exerted by evaluatively oriented conceptions on self-percepts of efficacy, aspirations, and analytic thinking and the causal structure through which these mediating regulatory processes affect performance accomplishments.

Evidence regarding the decisional activities of subjects in the entity condition indicates that their declining organizational attainments reflect impairment in the use of decisional skills rather than simply slackening of effort or diminished involvement in the managerial activity. Subjects who performed the managerial task under the entity conception surpassed those who approached the task as an acquirable skill in sheer amount of decisional activity. However, the attempt to hit on optimal motivators by varying many factors concurrently impeded discovery of the managerial rules. The more their perceived managerial efficacy declined, the more erratic they became in their decisional activities ($r = .56, p < .05$, and $r = .76, p < .01$, in the second and third trial blocks, respectively). Their counterparts in the acquirable skill condition continued to think in a strategically effective manner.

Subjects in the entity and acquirable skill conditions did not differ initially in either their perceived self-efficacy or organizational attainments. Their subsequent growing divergence in perceived self-efficacy and inferential activity suggests that differential conceptions of ability biased how initially similar substandard performances were being cognitively processed. Construal of substandard attainments as indicators of personal deficiencies would gradually create an inefficacious self-schema in the particular domain of functioning, whereas construal of substandard attainments as instructive guides for enhancing personal competencies would foster an efficacious self-schema. Such evolving self-beliefs can further bias cognitive processing of outcome information and promote actions that create con-
firmatory behavioral evidence for them. Indeed, the data reveal an exacerbation cycle of motivational and performance effects. These divergent changes are all the more significant because most of the subjects were seasoned managers and all were of high aptitude.

There is some evidence to indicate that in organizational milieus, low perceived self-efficacy to produce desired outcomes fosters attributions of blame and deficiencies to others. Thus, for example, teachers who have a low sense of instructional efficacy tend to regard difficult students as lacking ability andunteachable, whereas those who have a strong belief in their instructional efficacy view student problems as surmountable through extra effort and variation of educational approach (Ashton & Webb, 1986). The subjects in this experiment did not perform the managerial task dispassionately. They got deeply involved in the activity and personalized the employees. Those who suffered a loss in perceived managerial efficacy were uncharitable in their views of their employees. They regarded some of them as "unmotivatable," unworthy of supervision, and deserving of dismissal.

Although the sample size was relatively small, the temporal ordering of changes in self-regulatory factors antecedently to performance, the replication of the paths of influence in the path analyses across two series of trials, and the high degree of stability between the estimates for the two sets of parameters adds to the significance of the findings.

In accord with the proposed causal model, prior performance affected perceived self-efficacy, which, in turn, influenced subsequent level of organizational performance both directly and indirectly by its impact on analytic strategies. These findings are in accord with previous evidence that a high sense of personal efficacy fosters strategic thinking and raises organizational attainments under different levels of organizational complexity and goal assignments (Wood et al., in press). In these simulations, subjects had to regulate the actions of others. Considerable research documents the influential role played by perceived self-efficacy in the regulation of one's own motivation and actions (A. Bandura, 1986, 1988).

High personal goals also augmented organizational attainments by promoting effective problem-solving strategies, but goals did not affect performance independently. The task of exercising control over organizational outcomes differs in several important respects from that of realizing individualized outcomes. At the organizational level subjects have to rely on the aggregate efforts of others to achieve desired outcomes, whereas at the individual level one need regulate only one's own efforts. Socially mediated regulation of a group is considerably more complex than direct self-regulation. Functional relations established at the individual level may thus require qualifications at the group level.

Personal goals are readily translatable into performance attainments when people possess the knowledge and means to exercise control. Goals can affect performance directly by channeling attention and mobilizing effort and sustaining it in the face of obstacles (Locke et al., 1981). In most of the research demonstrating performance-enhancement effects of goals, subjects already possess the means and need only to intensify their efforts (Mento et al., 1987). Even on tasks that are directly controllable by effort alone, goal effects are weaker for more complex activities (Wood, Mento, & Locke, 1987). In the organizational task used in this study, the managers not only had to rely on the efforts of others to achieve desired outcomes, but they had to discover complex managerial rules and how best to apply them as they tried to conduct their managerial function. Until the rules were identified, goals could produce more effortful and discerning cognitive processing of outcome information, but not necessarily immediate improvements in organizational performance. Indeed, goals exerted their impact on performance by promoting effective managerial rule-learning strategies. However, after productive analytic strategies were adopted, personal goals no longer served this mediating function.

The multifaceted nature of the managerial activities and their complex linkages to organizational outcomes may also partly explain why personal goal setting did not have a direct impact on group performance. In the postexperiment inquiry, many subjects indicated that they were attempting to realize their organizational goal by concentrating their efforts on improving particular operational aspects of the organization. These operational subgoals involved reassignment of certain production subfunctions or a concerted effort to improve the performance of a particular employee. If grounded in sound judgment, such fractional changes would eventually raise organizational attainments without necessarily producing appreciable immediate gains.

Perceived self-efficacy did not account for variance in personal goal setting. This finding is discrepant from evidence that perceived self-efficacy influences the goals people set for themselves and the strength of their commitment to them (Locke et al., 1984; Taylor et al., 1984). Variation in the temporal properties of the goals may explain this discrepancy. In previous studies subjects set themselves proximal goals, whereas in this study they selected more distal goals for an entire series of performances. The instated ability conceptions would make the challenging preset production standard a highly salient distal goal. Subjects in the entity condition would strive for it as the evidential standard of competence, whereas more modest distal accomplishments would prove disappointing. Subjects in the acquirable skill condition would also aim for a high eventual accomplishment. The substantial negative discrepancy between prior performance and self-set goals indicates that the preset standard was indeed exercising considerable influence on the distal goal setting. Although prior performance had some effect on personal goals, the ones subjects were seeking to fulfill were far in excess of their attainments. This disparity remained even for subjects in the entity condition who began to lower their sights under the cumulative impact of failure.

The factors encompassed by prior performance level had no independent influence on subsequent organizational attainments. This finding underscores the considerable extent to which nonability self-regulatory factors may contribute to performance attainments. Among highly talented individuals, much of the variation in performance may be attributable to how well they use the skills they possess. An ability is only as good as its execution. Our research indicates that the conceptions of ability with which people approach complex tasks can affect self-regulatory factors in ways that are self-enhancing or self-impeding.
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