Self-Evaluative and Self-Efficacy Mechanisms Governing the Motivational Effects of Goal Systems

Albert Bandura and Daniel Cervone
Stanford University

The present research tested the hypothesis that self-evaluative and self-efficacy mechanisms mediate the effects of goal systems on performance motivation. These self-reactive influences are activated through cognitive comparison requiring both personal standards and knowledge of performance. Subjects performed a strenuous activity with either goals and performance feedback, goals alone, feedback alone, or without either factor. The condition combining performance information and a standard had a strong motivational impact, whereas neither goals alone nor feedback alone effected changes in motivation level. When both comparative factors were present, the evaluative and efficacy self-reactive influences predicted the magnitude of motivation enhancement. The higher the self-dissatisfaction with a substandard performance and the stronger the perceived self-efficacy for goal attainment, the greater was the subsequent intensification of effort. When one of the comparative factors was lacking, the self-reactive influences were differentially related to performance motivation, depending on the nature of the partial information and on the type of subjective comparative structure imposed on the activity.

The capability for intentional and purposive human action is rooted in cognitive activity. Social learning theory postulates two cognitively based mechanisms of motivation that serve such telic purposes. One mechanism operates anticipatorily through the exercise of forethought. By representing foreseeable outcomes symbolically, future consequences can be converted into current motivators and regulators of behavior. The second major source of cognitive motivation derives from internal standards and self-evaluative reactions to one’s performances (Bandura, 1977a).

The motivational effects of setting goals, which provides the standard against which performance is gauged, have been amply documented in different lines of research conducted under both controlled and naturalistic conditions. The evidence is relatively consistent in showing that explicit challenging goals enhance performance motivation (Locke, Shaw, Saari, & Latham, 1981). However, the psychological mechanisms through which personal standards create motivational effects and how these mechanisms govern motivation under different patterns of performance information have received less attention. It is to these issues that the present research addresses itself.

In the social learning analysis, self-motivation through performance standards operates largely through an internal comparison process (Bandura, 1978). When people commit themselves to explicit standards or goals, perceived negative discrepancies between what they do and what they seek to achieve creates self-dissatisfactions that serve as motivational inducements for enhanced effort. Both the anticipated self-satisfactions for matching accomplishments and the self-dissatisfactions with substandard performances provide incentives for heightened effort.

Performance motivation is not posited to be a monotonically increasing function of degree of perceived discrepancy. Performances that fall markedly short of standards are apt to give rise to discouragement and goal abandonment. Moderately discrepant performances, which leave construal of the standard as attainable (Atkinson, 1964; Locke, 1968), are likely to activate self-dissatisfactions that spur efforts to bring performance in line with

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valued standards. Attainments that match or surpass personal standards create self-satisfactions that serve as positive inducements for further pursuits.

Activation of self-evaluative processes through internal comparison requires both personal standards and knowledge of the level of one's performance. It follows from this formulation and Locke's goal theory (1968) that neither knowledge of performance without standards nor standards without knowledge of performance provides a basis for self-evaluative reactions and thus has little motivational impact. There is some empirical evidence to suggest that this is indeed the case (Becker, 1978; Strang, Lawrence, & Fowler, 1978). Simply adopting goals, whether easy or personally challenging ones, without knowing how one is doing seems to have no appreciable motivational effects.

Results of studies varying the properties of goals are also in accord with the postulated self-evaluative mechanisms (Bandura & Schunk, 1981; Bandura & Simon, 1977; Locke, 1968; Steers & Porter, 1974). Explicitness, challengeability, and temporal proximity of subgoals and standards are conducive to enlisting self-reactive influence by specifying the amount and type of effort required to fulfill the goals. Such properties augment the motivational impact of goals. Empirical verification of the self-reactive causal link would provide a conceptual framework within which to analyze the features of goal systems that carry motivational potential.

The self-efficacy mechanism also plays a central role in human agency and self-motivation (Bandura, 1981, 1982). It is partly on the basis of self-percepts of efficacy that people choose what to do, how much effort to mobilize for given activities, and how long to persevere at them (Bandura, 1977b; Brown & Inouye, 1978; Schunk, 1981; Weinberg, Gould, & Jackson, 1979). Whether negative discrepancies between standards and performance are motivating or discouraging is likely to be influenced by people's perceptions of their efficacy to attain the standards they set for themselves. Those who have a low sense of self-efficacy may be easily discouraged by failure, whereas those who are assured of their capabilities for goal attainment intensify their efforts when their performances fall short and persist until they succeed.

The present research was primarily designed to test the notion that self-evaluative and self-efficacy mechanisms operate differentially in performance motivation, depending on the structure of comparative performance factors. The guiding conceptual scheme posits that both of these self-processes jointly regulate effort under conditions permitting cognitive comparison between a standard and knowledge of performance. To test this notion, conditions were created in which both comparative factors were present, one of the comparative factors was lacking, or both were absent. Subjects performed a strenuous physical activity on an ergometric device under conditions including either goals with performance feedback, goals alone, feedback alone, or without the presence of either factor. To equalize the constituent factors across subjects and treatment conditions, the goals involved a 40% increase in effortful performance and feedback of a 24% gain in performance. These values were selected to create a moderate negative discrepancy sufficient to activate self-dissatisfied reactions without unduly undermining self-percepts of efficacy for goal attainment. The research of Atkinson (1964) and Locke (1968) indicates that a moderate discrepancy is well suited for this purpose. After the performance session in which the requisite goal and feedback conditions were created, subjects recorded their level of self-satisfaction with their performance and their perceived self-efficacy for goal attainment, whereupon their effortful performance was again measured.

By systematically varying the comparative factors and measuring the posited self-processes antecedently, the integrated design permits a dual level of verification of requisite conditions for motivational enhancement tied to mediating self-processes. It was predicted that subjects in the condition combining goals with performance feedback would display the highest gains in effortful performance. On the premise that self-evaluative and self-efficacy mechanisms are most consistently activated in the service of motivation only when goals and feedback information are both present, it was hypothesized that subjects receiving either goals or feedback alone would lack an essential
comparative element and, hence, would not differ from those receiving neither of these factors.

As the primary test of the theory under examination, it was predicted that in the condition combining goals with feedback, the magnitude of performance gains would vary as a function of level of self-dissatisfaction and perceived self-efficacy for goal attainment. The higher the subjects' self-dissatisfaction, the more they would increase their performance to bring it in line with their standard. The higher their self-percepts of efficacy, the greater effort they would mount to attain their goal. Subjects who were self-dissatisfied with their substandard performance but judged themselves highly efficacious in attaining their goal would show the highest performance gains. In contrast, those who judged themselves inefficacious and were not unduly self-dissatisfied would mobilize the weakest effort. In conditions in which one or both comparative factors are lacking, the mediating mechanisms are likely to operate variably depending on what partial information is available and on subjective provision of the missing comparative factor.

Method

Subjects

The subjects were 45 men and 45 women drawn from an introductory psychology course. Twenty subjects, equally divided by sex, were randomly assigned to each of four treatment conditions. Ten subjects were similarly assigned to a self-judgment control condition designed to determine whether recording one's self-satisfaction and self-percepts of efficacy, in itself, had any reactive effects on performance.

General Procedure and Apparatus

The introductory instructions describing the nature of the study were identical for all subjects. The experiment was presented as part of a program of research ostensibly designed to identify performance tasks that might eventually prove useful for planning and evaluating postcoronary rehabilitation programs. It was further explained that the information being gathered would not only aid development of diagnostic devices but also provide normative data on physical stamina at different age levels. The relation between cardiovascular fitness and performance on aerobic tasks was then described to lend further credibility to the activity.

The performance task apparatus was a Schwinn Air-Dyne ergometer in the form of an exercise device that uses a wind vane system to provide variable air resistance. In its modified form, the ergometer was operated by alternatively pulling and pushing two arm levers. The exerted force rotated a wheel with fanlike wind vanes, creating resistance for the physical effort.

The ergometer task was chosen for a number of reasons. This effortful activity combined with the rationale was received with uniformly high credibility. It yielded a precise measure of performance effort with virtually no upper limit. Because it required considerable effort over extended periods, the task provided a stringent test of how the postulated determinants and mechanisms affect the mobilization and maintenance of performance motivation. Finally, the task itself provided little implicit feedback regarding performance level, which allowed for credible prearranged feedback. Because subjects could not easily discern quantitative variations in their physical output across sessions, goals and feedback information could be systematically varied without jeopardizing the perceived veridicality of the feedback.

The ergometer was connected by a cable to a work load indicator with an odometer in the adjoining room. The odometer readings were recorded at 1-minute intervals during the 5-minute sessions so as to capture any variations in performance during the session. To measure precisely the performance effort expended, the odometer readings were converted to kilopond meter units. Kilopond units are indices of work output that consider both the speed at which the ergometer is operated and the exponential increase in air resistance with increasing speed. The five sets of kilopond scores resulting from the five 1-minute intervals were summed to obtain a total performance score for each session.

Before starting the experiment, subjects completed a background questionnaire that asked about their age, sex, height, weight, and smoking habits. It was included both to add further credence to the prior instructions and to increase the naturalness of the assessment, in a later session, of self-reactions imbedded among filler items ostensibly tapping other aspects of physical status. They also filled out a physical-readiness questionnaire designed to exclude any subject for whom extended physical exertion would be medically contraindicated. Only one subject, who reported a history of cardiovascular problems, was excluded on this basis.

Subjects removed their watches to control for possible variations in the regulation of effort by checking the time elapsed. They were informed that each performance session would last 5 minutes but were not told how many sessions they would complete. The latter procedure was instituted to eliminate the possibility that subjects might intensify their performance in the third session if they knew it was their final effort.

The experimenter concluded the general instructions by explaining that he would be in the adjoining room tending to the recording instruments during each performance session. The subject would be signaled when to begin and end each session via an intercom system.

Baseline Performance Session

All subjects performed the ergometer task alone for a 5-minute baseline period. Pretesting indicated that a 5-
minute session required substantial performance effort without being overly fatiguing.

Following the baseline assessment, subjects were randomly assigned within sex groupings to treatment conditions. The random order of assignment was devised for the entire sample at the outset of the study. After each subject completed the baseline session, the experimenter removed a cover card that revealed the condition to which the particular subject was assigned. Thus, the experimenter had no prior knowledge of the subjects' condition assignments during the baseline session.

**Goal Setting and Feedback Variations**

In conditions including goal setting, subjects selected a goal for performance improvement in subsequent sessions. The experimenter explained that in coronary rehabilitation programs patients have goals for increasing their physical activity. These goals vary across cases. Therefore they would perform the ergometer task with goals to shed light on the effects of this goal variability.

Goals were not simply assigned to subjects. Rather, they ostensibly selected their own goal level. An apparent-choice procedure was used to increase subjects' sense of self-determination and commitment to the goal (Kiesler, 1971; Langer, 1975). They were told that to study goal levels representative of the range found in a rehabilitation program, they would choose one goal from among a wide range of goal levels. It was explained that in rehabilitation programs, goals are set based on the patient's current physical status. However, this psychological information was not available for participants in the present study, there was no basis for assigning particular goals to particular subjects. Hence, subjects would simply select one from among a variety of goals.

Different goal levels representing percentage decrements and percentage improvements above baseline performance were printed on cards. After the full range of goal levels was inspected, the experimenter placed all the goal cards in a cloth bag attached to a wooden rim and handle, shook the bag, and presented it to the subject, who selected a goal. Unbeknownst to the subject, the choice was prearranged to be a 40% increase in performance above baseline performance. This was achieved by flicking a hidden switch on the bottom of the handle, automatically switching compartments of the bag so that subjects were selecting their goals from a preloaded set of goal cards, all of which represented a 40% performance increase.

A 40% goal level was chosen for several reasons. It represented an attainable goal, a negative performance discrepancy from it would appear credible, and neither the goal nor the performance discrepancy was so high as to undermine perceived self-efficacy in attaining it.

Subjects in conditions that did not include goals received the identical information as did their goal-setting counterparts concerning how coronary rehabilitation patients strive for different goals of increased physical activity as part of their recovery program. They were all given the same information about goals and striving for performance improvement to equate the groups for the suggestion of increased effort. The experiment thus provided a clear test of the motivational contribution of actual goal adoption.

To control for any possible experimenter bias, all the information for creating the requisite conditions for the main phase of the experiment was presented remotely via a video system. The experimenter explained that he had to reset the recording instruments after the second session. Thus, the video system would be used to convey further information. Subjects then performed the ergometer task for 5 minutes alone in the room, whereupon they were instructed through the intercom to turn on the video terminal.

The performance feedback and goal-setting information was printed on subsets of cards that could be combined to include goals and feedback, goals alone, feedback alone, or neither. A camera in the adjoining room transmitted the relevant information to the video screen. In the feedback-alone conditions the sign read "Your performance score for the last session was ___% your first session." The experimenter wrote "24" and "above," respectively, in the blanks. This feedback information, independent of the subject's actual performance, was written in the blanks to avoid the impression that the feedback may have been prearranged. For subjects in goals-alone conditions, the sign read, "The goal you were aiming for was ___% of the experiment filled in " +40%." The above two subsigns were combined for subjects in the goals and feedback condition, informing them that they had attained a 24% increase in performance and were aiming for a 40% increase.

For subjects in all conditions, the next sign that appeared on the screen instructed them to complete a questionnaire that was next to the video terminal.

**Measurement of Self-Evaluation and Perceived Self-Efficacy**

The questionnaire contained the two measures of central interest: subjects' level of self-satisfaction with their performance and their perceived self-efficacy at reaching various performance attainments. These scales were embedded in a set of filler items (cast in the same format) measuring exercise routines and general physical status.

In measuring self-evaluative reactions, subjects rated their self-reactions on a 25-point scale, ranging from "highly self-satisfied," through "neutral," to "highly self-dissatisfied." They first rated their level of self-satisfaction or dissatisfaction with their performance in the second session, which they had just completed. Subjects could be pleased with their prior progress but self-dissatisfied were they to achieve the same level of performance on their subsequent attempts. Hence, for the second rating, subjects rated how self-satisfied or self-dissatisfied they would be if they attained the same level of performance in the next session.

Subjects recorded their perceived self-efficacy for goal attainments on an efficacy scale that described 14 possible levels of performance attainments relative to the baseline level. The goal attainments varied in 10% intervals from a 50% decrement to an 80% increase above the baseline level. For each of the 14 performance levels, subjects rated the strength of their perceived efficacy that they could attain them on a 100-point scale, ranging in 10-unit intervals from "high uncertainty" to "intermediate values of certainty" to "complete certitude." The strength of subjects' perceived efficacy that they could achieve a 40% performance increase was the pertinent efficacy measure.

**Performance Test**

After the assessment of self-processes, subjects were instructed via the intercom to resume the ergometer task.
They engaged in the effortful activity for 5 minutes, during which their performance was recorded. At the conclusion of the formal experiment, subjects completed a questionnaire in which those in the goal conditions rated their perceptions of the attainability of a 40% increase in performance. Subjects in conditions without goals were asked if they had spontaneously set any performance goals for themselves and, if they had, to describe their goals. The groups did not differ on the earlier filler items on which they rated their physical stamina and the type and amount of physical activity they regularly perform each week.

Results

Effects of Self-Judgments

To test for possible reactive effects of recording one’s self-evaluative reactions and self-percepts of efficacy, the sample of 10 subjects randomly selected for this purpose performed with goals and feedback but did not record their self-evaluative reactions and self-percepts of efficacy. The questionnaire they completed contained only the filler items. Their performance was compared against that of subjects who also performed with goals and feedback after recording their self-satisfaction and perceived self-efficacy. The analysis revealed no significant difference between the groups in performance change, \( t(28) = .70 \). Nor did these two groups differ in how they responded to the postexperiment questionnaire. Recording self-judgments thus had no reactive effects.

Initial Effects of Goal Setting

As a first step toward creating the requisite treatment conditions, after the baseline performance half of the subjects received a goal of improving their performance by 40%. Subjects increased their performance level 42% without goals and 85% with goals. These performance changes were analyzed by a two-way analysis of variance with goals and sex as factors. To equalize variances, a square root transformation was performed on the scores. The analysis revealed a significant main effect for goals, \( F(1, 76) = 16.26, p < .001 \). As will be shown below, this initial gain carried over, but goals alone produced no further increment in performance motivation. Neither sex nor the interaction between sex and goals had any significant effect on change in performance.

At the end of the second performance session, the appropriate groups received performance feedback, all groups recorded their self-satisfaction and self-efficacy, and all groups then performed the effortful task again. In the second session the conditions comprising goals and feedback and feedback alone exist in name only. It is the performance of subjects in the final session, when all four treatment conditions were fully formed and operating, that bears on the major hypotheses, to which we turn next.

Effects of Goal Setting and Feedback on Effortful Performance

To test how the structure of comparative factors effects changes in level of motivation, the percentage increase in effortful performance above that of the second session was computed. In Figure 1 the mean percentage increases are plotted as a function of treatment conditions. Subjects who had the benefit of both goals and feedback more than doubled their performance over and above those subjects receiving either the goal alone, feedback alone, or neither factor.

Baseline performance levels could have influenced later performance change. An analysis of covariance was therefore computed, with treatment conditions and sex as factors and

![Figure 1. Mean percentage increase in effortful performance under conditions varying in goals and performance feedback.](image-url)
the first session performance as the covariate. A linear contrast showed that subjects in the condition combining goals with feedback outperformed those in the other conditions, \( F(1,71) = 18.42, p < .0001 \), which did not differ from each other. The same pattern of results is obtained if analysis of covariance is performed on performance scores in the third session, with performance in the second session serving as the covariate. Goals with feedback surpassed the other conditions, \( F(1,71) = 5.59; p < .025 \), which did not differ from each other. The analysis failed to yield any significant effects on performance change for sex either independently or in interaction with treatment conditions.

Mechanisms Governing Motivation Effects

Mean levels of perceived self-efficacy and self-evaluation in the various treatment conditions are presented in Table 1. The self-processes did not differ in mean level, but the condition combining a goal with feedback of a substandard gain substantially increased the variance of how self-satisfied subjects would be with a similar future performance as compared both to feedback alone, \( F(19, 19) = 2.64, p < .05 \), and to the control condition, \( F(19, 19) = 2.15, p < .06 \). However, as hypothesized, these self-processes relate to performance motivation in strikingly different ways when the requisite comparative factors are fully present than when they are present only partially or not at all.

Product-moment correlations were computed between the indices of the self-processes and percentage performance change. Degree of self-dissatisfaction with the preceding performance and self-dissatisfaction if the same level of performance was attained in the next session were each correlated with percentage of subsequent performance change. It is the predictiveness of the second self-evaluative measure that is of greatest interest because it more closely reflects the future performance attainments subjects judge they must fulfill to feel self-satisfied. The role of perceived self-efficacy as a performance motivator was evaluated by correlating strength of perceived self-efficacy for a 40% goal attainment with percent of performance change. Correlational analyses were conducted separately for each of the four treatment conditions based upon 18 degrees of freedom for each group. The complete set of correlations is presented in Table 2.

Complete Comparative Factors (Goal Plus Feedback)

Social learning theory posits that dependable activation of self-evaluative mechanisms requires both goals and performance feedback. Correlational analyses conducted on data from the condition combining goals with feedback information indeed confirmed that self-dissatisfaction is predictive of performance change (Table 2). The more self-dissatisfied subjects were with the substandard performance they had just completed, the more they heightened their next performance (\( r = .37, p = .05 \)). Level of self-dissatisfaction with the same substandard performance were it to occur on the next session was even more predictive of subsequent performance gains (\( r = .51, p = .01 \)).

Perceived self-efficacy is also predictive of the performance changes exhibited by subjects who had the benefit of goals and feedback. The more self-efficacious they were that they could attain the 40% goal, the more highly they boosted their next performance (\( r = .45,\

Table 1
Mean Levels of Perceived Self-Efficacy and Self-Evaluation in the Treatment Conditions

<table>
<thead>
<tr>
<th>Self-process</th>
<th>Goal + feedback</th>
<th>Goal</th>
<th>Feedback</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Perceived self-efficacy</td>
<td>85.0</td>
<td>25.4</td>
<td>81.5</td>
<td>24.1</td>
</tr>
<tr>
<td>Self-dissatisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior performance</td>
<td>10.4</td>
<td>3.8</td>
<td>9.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Future performance</td>
<td>10.1</td>
<td>5.9</td>
<td>9.8</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table 2

Relation of Self-Evaluation and Perceived Self-Efficacy to Effortful Performance Under Conditions in Which the Requisite Comparative Factors of a Goal System Are Present or Absent

<table>
<thead>
<tr>
<th>Self-process</th>
<th>G + F</th>
<th>G</th>
<th>F</th>
<th>C</th>
<th>G + F</th>
<th>G</th>
<th>F</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived self-efficacy</td>
<td>.45**</td>
<td>.57***</td>
<td>-.32</td>
<td>-.09</td>
<td>.43**</td>
<td>.14</td>
<td>-.24</td>
<td>-.19</td>
</tr>
<tr>
<td>Prior performance</td>
<td>.37*</td>
<td>-.44*</td>
<td>-.18</td>
<td>.27</td>
<td>.36</td>
<td>.03</td>
<td>.08</td>
<td>.22</td>
</tr>
<tr>
<td>Future performance</td>
<td>.51**</td>
<td>-.24</td>
<td>-.59***</td>
<td>.24</td>
<td>.68****</td>
<td>-.20</td>
<td>-.03</td>
<td>.24</td>
</tr>
</tbody>
</table>

Note. G = goal; F = feedback; C = control.
* p = .05, ** p < .03, *** p < .01, **** p < .001.

p < .025). Correlations were also computed between performance effort and perceived self-efficacy to accomplish each of the 14 performance levels included in the efficacy scale. Subjects' perceived efficaciousness to attain the 40% goal exceeded the correlations at each of the 13 remaining levels, a pattern that is highly significant (p < .001, as estimated by binomial test). Self-satisfaction and percepts of self-efficacy were not significantly related in any of the conditions.

It is postulated that self-dissatisfaction and perceived self-efficacy jointly determine performance changes. To test this, indices of self-dissatisfaction with future substandard performance and perceived self-efficacy for goal attainment were converted to standardized T scores, combined, and correlated with performance change. This composite index of the mediating self-processes was highly predictive of subsequent performance change (r = .63, p < .002).

The joint operation of these two motivational self-processes in the condition combining an explicit goal with feedback is most graphically revealed by categorizing subjects in terms of whether they expressed self-dissatisfaction with future substandard performance and whether their perceived self-efficacy for goal attainment exceeded the 50% strength value. The mean percentage changes in performance as a function of varying combinations of these self-processes are presented in Figure 2. As may be seen in the left-hand panel, subjects who were both self-dissatisfied but highly self-efficacious displayed huge performance gains. The self-inefficacious but self-satisfied subjects manifested little performance change. If at least one of the two self-processes was strongly operative, subjects achieved moderate performance gains. Because the efficacious–dissatisfied and the inefficacious–satisfied subjects performed comparably, these two groups were combined to increase the subgroup size for statistical analysis. Even though the subgroups—formed by dichotomizing scores on the two self-processes—were small within this total sample of 20 subjects, the variations in effortful performance were significant, F(2, 17) = 4.10, p < .04.

These two self-processes even predict changes in performance motivation over the course of the session. For this temporal analysis the difference in physical effort exerted between the first minute and the last minute of the final session was computed and correlated with the indexes of the self-processes (Table 2). Self-dissatisfaction with future substandard performance (r = .68, p < .001) and self-efficacy for goal attainment (r = .43, p < .03), both singly and in combination (r = .72, p < .001), predicted the degree of performance change over time. As shown in the right-hand panel of Figure 2, the self-dissatisfied but self-efficacious subjects greatly accelerated their performance effort, those who were either self-dissatisfied or self-efficacious sustained their performance effort, and those who judged themselves inefficacious to fulfill the goal and were satisfied with a 24% future increase slackened their efforts and showed a substantial decline in performance by the end of the session. Because the means for the high-efficacy–low-dissatis-
faction and the low-efficacy-high-dissatisfaction subgroup were virtually identical and the ns were small, these two subgroups were combined for the ANOVA. These differential patterns of motivational change are highly significant, $F(2, 17) = 14.73, p < .001$.

Of the subjects in the ineffectiveness-satisfied subgroup, 83% perceived the selected goal as virtually unattainable, whereas only 7% of the remaining subjects considered the goal beyond their reach. These differential perceptions of goal attainability, which can markedly affect goal adherence, are highly significant ($z = 3.45, p < .001$).

**Partial Comparative Factors**

Subjects who performed with either goals alone or feedback alone lacked one of the critical elements to regulate their effort effectively through self-reactive influence unless they supplied the missing element subjectively. Correlational analyses indeed reveal that the constituent self-reactive influences operate differentially in performance motivation depending on which comparative factor is lacking.

**Feedback-alone condition.** Subjects in the feedback-alone condition were informed that they had improved by 24% but had no explicit goal to judge whether the gain was exemplary or insufficient. The extent to which they were self-satisfied with this performance gain was unrelated to subsequent performance change, but the more satisfied they were with maintaining a similar future gain, the greater was their performance ($r = -.59, p < .01$, two-tailed). Enhanced effort is thus related to satisfaction under feedback of progress alone but to discontent when that same level of progress is viewed in relation to a seemingly difficult standard of a 40% gain.

When people engage in an ongoing activity and are periodically informed of their performance attainments, some spontaneously set goals for themselves (Bandura & Simon, 1977). In the feedback-alone condition 70% of the subjects indeed reported in the postexperiment questionnaire that they set performance standards for themselves on their own. Those who set no goals for themselves achieved no change (.4%), those who aimed to sustain their improvement realized a modest gain (27%), and those who set themselves the more demanding
goal of bettering their improvement raised their level of performance substantially (40%). This pattern of differences is significant even with the limited sample size, \( F(2, 16) = 3.51, p = .05 \). In contrast, self-set goals had no effect on performance effort in the condition in which subjects received no performance feedback.

Whether knowledge of a 24% increase in performance is indicative of self-efficacy or self-inefficacy depends on what goals, if any, subjects set for themselves as suitable markers of capability. Because subjective goal setting varied widely, perceived self-efficacy for a 40% goal attainment bore no significant relation to performance change in the feedback-alone condition.

**Goal-alone condition.** In the goal-alone condition, subjects aimed for a 40% increase in performance but had no objective knowledge of how they were doing. The stronger the subjects’ self-efficaciousness that they could attain such a goal, the greater was their performance change (\( r = .57, p < .005 \)). The correlation of perceived self-efficacy to attain the 40% goal with performance effort was higher than the correlations at all but one (60% goal) of the 13 levels of goal attainment. This pattern is highly significant (\( p < .002 \), as estimated by the binomial test). In this condition, in which subjects had only their subjective performance impressions to go on, it was self-satisfaction with their imagined attainment that was related to subsequent performance change (\( r = -.44, p < .05 \), two-tailed), but degree of self-evaluation for a similar future performance was not.

**No Comparative Factors (No Goal, No Feedback)**

In the condition in which subjects lacked both goals and knowledge of how they performed, they had little basis for either appraising or regulating their ongoing performance effort. Self-processes were unrelated to performance change (see Table 2).

**Discussion**

The findings of the present study support the theory that goal systems gain motivating power through self-evaluative and self-efficacy mechanisms activated by cognitive comparison. Goals enhanced performance effort only under conditions combining a personal standard with performance feedback of progress toward it. Neither goals alone nor performance feedback alone, both of which lack an essential comparative ingredient, effected change in motivational level. When first adopted, goals alone produced a performance gain that carried over, but they did not generate any further increments in motivation in the absence of performance knowledge. Although goals alone did not further augment performance motivation, persistence of the initial boost enabled the subjects who performed with goals alone to surpass the controls. The pattern of results at the point at which all conditions were fully operative is consistent with Locke’s goal theory (Locke et al., 1981).

Analysis of performance effort as a function of self-set standards under conditions of feedback alone is also in accord with the view that both performance knowledge and a standard of comparison are needed to produce motivational effects. For the most part, the self-prescribed goals were of a general sort and not unduly challenging. Nevertheless, participants who set no goals were outperformed by those who set themselves the goal of sustaining their performance gain, who, in turn, were outperformed by those who sought to better their past attainment. These goals were of a more qualitative sort of sustaining or surpassing one’s prior accomplishments (e.g., “I want to do as well as the time before . . . do better than the previous session.”) rather than stated in terms of explicit quantitative levels of performance change. Although such goals had motivating potential in the context of performance knowledge, the rise in performance effort for feedback with qualitative self-set standards was less than that for the same feedback with a challenging (40%) quantified standard. These findings are congruent with those of previous studies showing that explicit goals are more motivating than are general ones (Latham & Yukl, 1975; Locke, 1968). Self-set goals had no motivating potential without performance information in the control condition.

Results of the correlational analyses support the proposition that goal systems affect per-
formance motivation in part through self-evaluative and self-efficacy mechanisms. Moreover, the findingsshed interesting light on how these self-mechanisms operate in performance motivation when only partial comparative information is available. When performance information is combined with a standard of comparison, the higher the self-dissatisfaction with a substandard performance and the stronger the perceived self-efficacy for goal attainment, the greater is the subsequent intensification of effort. In a recently completed study employing a path analysis, Locke and his colleagues (Locke, Frederick, Lee, & Bobko, Note 1) found that perceived self-efficacy affects the level of self-set goals, strength of goal commitment, and level of cognitive performance.

When one of the requisite comparative factors is lacking, the relation of self-reactive influences to performance motivation depends on the nature of the partial information provided or that performers fashion for themselves. Thus, in the condition providing only feedback, knowledge of a 24% gain in performance carried no absolute value. It represented a commendable accomplishment if judged against subjective modest aspirations but a failure if evaluated against subjectively invoked high standards. Subjects' reports of their self-set goals reveal that many of them either set no goals for themselves (45%) or aimed for the same level of performance gain (25%). For subjects in this condition, a 24% gain constituted positive or success feedback. The more pleased subjects were with sustaining this level of improvement, the more effortfully they behaved. In contrast, a 24% gain when one is aiming for a 40% increment constitutes negative or failure feedback. Discontent with the prospect of similar failure in the future spurred subjects to greater effort. Inverted meaning of the performance feedback thus produces inverse relations between self-evaluation and performance motivation.

The findings that self-evaluative reactions operated differently on motivation under varying comparative structures testify to the complexity of the relation between self-satisfaction and motivation. With goals and performance feedback, self-dissatisfaction affects effort (see also Locke, Cartledge, & Knerr, 1970), whereas with either goals alone or feedback alone, effort seems to be governed by level of self-satisfaction.

Variable self-prescribed standards similarly confer diverse self-efficacy value on the same performance gain. Subjects oriented toward sustaining their level of effortful performance are likely to raise their self-percepts of efficacy on learning that they surpassed their past achievements by 24%, whereas those who ask much of themselves might interpret the same performance gain as a sign of physical inefficacy. Perceived self-efficacy in attaining a 40% goal therefore bore no consistent relation to subsequent effort in the feedback-only condition. However, in the goal-alone condition, in which all performers aimed for the same challenging standard but had to guess how they were doing, the stronger their perceived self-efficaciousness for goal attainment and the more pleased they were with whatever they surmised their prior performance to be, the more they heightened their effort.

Self-reactive influences are least likely to be activated in any consistent way in different individuals by conditions providing neither evaluative standards, performance information, nor even distinct implicit feedback concerning the level of performance. Not surprisingly, the latter condition, which was devoid of information for monitoring, gauging, and regulating one's effort, yielded no significant correlates.

In the present study, predicted relations were tested under conditions in which performance was moderately discrepant from personal standards. The informative next stage for research is to clarify further the precise nature of the relation between self-percepts of efficacy, self-evaluation, and performance motivation when attainments diverge from personal standards across a wide range of positive and negative magnitudes. Recall that social learning theory postulates a linear positive function between perceived self-efficacy for goal attainment and effort but a nonlinear one between degree of goal discrepancy and effort, as mediated through self-evaluative reactions.

Theorists working within the framework of achievement motivation have addressed the issue of task difficulty mainly in terms of success expectancy and valuation of goal attainment (Atkinson & Raynor, 1974; Feather, 1982). Because these two factors are considered
to be inversely related, performance is highest for tasks of moderate difficulty, although Heckhausen (1977) posits a somewhat lower success probability than does Atkinson as being maximally motivating. In the goal theory developed by Locke (1968), performance is linearly related to goal difficulty as long as performers continue to adhere to taxing goals. By expanding the self-process probes to include revision of goals, as well as perceived self-efficacy and self-satisfaction with prior and future attainments, the paradigm developed for the present experiment might help shed some additional empirical light on subprocesses mediating effort when attainments diverge from standards in degree and direction.

Performances that fall markedly short of standards are likely to be demotivating by undermining perceived self-efficacy. To the extent that performers judge the standard as exceeding their capabilities, they are apt to lower their standard and demand less of themselves. Such adjustments would lower effort and performance (Feather, 1982; Locke, 1968). Of interest is the threshold strength value below which reduced self-efficaciousness results in goal abandonment. As already noted, moderately discrepant attainments heighten motivation to fulfill standards that appear attainable through extra effort. When dissatisfaction combines with self-efficaciousness, effort is mobilized to master the challenge. The third pattern of interest concerns attainments that either fall just short of challenging standards or exceed them. High accomplishments that strengthen perceived self-efficaciousness are likely to lead performers to raise their standards (Lewin, Dembo, Festinger, & Sears, 1944), thus creating new motivating discrepancies for themselves. Under the latter circumstance, the pattern of self-subprocess regulation of motivation would include satisfaction with prior attainments—but discontent with similar future ones—high self-efficaciousness, and raised aspirations.

Depending on their direction and magnitude, goal discrepancies can raise the motivational potential of one of the self-reactive factors while lowering the motivational potential of the other. Thus, large negative discrepancies increase self-dissatisfaction but lower perceived self-efficacy for goal attainment. However, a decrement in self-efficacy sufficient to prompt adoption of a lower standard would serve to moderate evaluative self-reactions. For example, when provided with feedback of a substandard performance, some of the subjects in the present study seemed to abandon their goal as unattainable and were no longer unduly self-dissatisfied with moderate progress. Smaller negative discrepancies reduce self-dissatisfaction but strengthen self-percepts of efficacy. Further research is needed to determine the relative susceptibility of these two self-reactive factors to failed efforts and how they may combine and compensate for each other as motivators of action.

Social learning theory distinguishes between the effects of strength of perceived self-efficacy on effort during learning and during execution of established skills (Bandura, 1982). In approaching learning tasks, persons who perceive themselves to be supremely self-efficacious in the undertaking may see little need to invest much preparatory effort in it (Salomon, in press). However, in applying acquired skills, strong belief in one's self-efficaciousness intensifies and sustains the effort needed to realize challenging goals, which are difficult to attain if one is plagued by self-doubts. In short, self-doubts create an impetus for learning but hinder adept use of established skills.

Reference Note


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