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Resolving Scientific Disputes by the Joint Design of Crucial Experiments by the Antagonists: Application to the Erez–Latham Dispute Regarding Participation in Goal Setting

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In this monograph we describe a unique method for resolving scientific disputes: the joint design of crucial experiments by the antagonists themselves with the help of a mediator. This method was applied to the issue of the effect of participation on goal commitment and performance. In research on this topic, Latham and his colleagues had obtained markedly different results from those obtained by Erez and her colleagues. With Locke serving as a third party mediator, Latham and Erez designed four experiments to resolve the discrepancies. The experiments were conducted at the University of Washington and the University of Maryland. The results revealed that the major reason for the difference was that Erez gave very brief *tell* instructions to her assigned goal subjects, whereas Latham used a *tell and sell* approach. Four additional factors also contributed to the earlier difference in findings: goal difficulty, setting personal goals before goal treatments were introduced, self-efficacy-inducing instructions, and instructions to reject disliked goals. It was concluded that (a) the differences between Latham and Erez can be explained on the basis of differences in specific procedures, and (b) the method used to resolve this dispute should be used by other investigators.

In this monograph we present a method of resolving scientific disputes that may be unique in the history of psychology, and we demonstrate its application to a current scientific dispute. The method involved the joint design of "crucial experiments" by the antagonists, using a third party as a mediator.

Typically, when there are disagreements regarding a certain finding or relationship in science, the disputants attack one another in the literature. Each may claim that the other used a flawed procedure, an invalid design, inappropriate analyses, or that the findings were valid but misinterpreted. The rest of the scientific community then lines up on either side (or in the middle).

At this point, several things can happen. The disputants may each conduct further experiments until one side wears the other down or persuades the scientific community that his or her view is correct. This occurred in the controversy surrounding motivator–hygiene theory with its critics winning the day. Sometimes a controversy continues because of strong convictions that may, in part, be ideologically based. A case in point is the heritability of intelligence dispute, which continues to this day. In other instances, the scientific community may simply lose interest in the issue on the grounds that it is not worth pursuing. An example is the controversy over intrinsic motivation; industrial and organizational psychologists have, in recent years, basically ignored it.

What has rarely been done in scientific disputes is for the disputants themselves to work together to try to design one or more crucial experiments to resolve the differences in their findings. It is not difficult to understand why one rarely if ever sees this method used. It can be ego threatening to work with an antagonist after he or she has made opposing scientific claims in print; the antagonists face the risk that their work may be shown to be wrong. Furthermore, the disputants may not like each other personally, thus making any attempt at joint research impractical. Finally, the dispute may be based on ideological issues, thus limiting what can be accomplished through the systematic collection of data.

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The present series of studies were designed jointly by two antagonists as a result of the following circumstances. First, the antagonists were willing to risk the possibility that one or both of them could be wrong. Second, they did not dislike each other. Third, only one party was committed to her data on the basis of ideological as well as scientific criteria. (The other party had once shared the same ideology, but had modified his view on the grounds that the data did not support it.) Fourth, the antagonists were genuinely curious about the reasons for the contradictory findings. They recognized that there was little chance of resolving their dispute without collaboration because experiments are rarely reported in sufficient detail to permit exact replication. Fifth, there was a third party (Locke) who was a close friend of both disputants and whose objectivity was unquestioned by them. He agreed, at their request, to mediate the dispute and to help them design the experiments. The need for a third party was based on the recognition that it was unlikely that the antagonists could agree on all of the issues without outside assistance. Finally, the three parties, who lived in widely separated locations, were able to meet face-to-face at a scientific meeting to discuss their previous studies in detail and to agree on an experimental plan. Communication was facilitated further by Erez's sabbatical leave at the University of Maryland during 1985–1986.

The face-to-face discussions were followed by extensive telephone calls and written correspondence. Thus, every experimental condition, including the choice of tasks, the experimental manipulations (including verbatim instructions), and all questionnaire measures (most of which were common to all the experiments) were agreed on by the three researchers prior to the experiments. In addition, the experiments were conducted, not by the protagonists themselves, but by research assistants who were unaware of the hypotheses of the studies. The experimenters were told truthfully that the researchers did not know how the studies would come out.

Studies 1 and 2 were conducted under the direction of Latham; Studies 3 and 4 were conducted under the direction of Erez. All four studies were conducted in the United States.

Research on Participation

Many issues in the behavioral sciences induce profound disagreements among researchers. An example concerns the motivational effects of participation in decision making (pdm) on performance. Locke and Schweiger (1979) pointed out that much of this dispute has been ideological rather than scientific in nature, a point that is further attested to by the recent Sashkin (1984, 1986) versus Locke, Schweiger, and Latham (1986) debate. This dispute, however, has not been based entirely on ideology. Participation has been studied often, and some of the studies have in fact resulted in contradictory scientific findings. Of direct concern to this article are the studies of participation in goal setting.

As a result of field research conducted at the General Electric Company, Meyer and his associates (French, Kay, & Meyer, 1966; Kay, Meyer, & French, 1965; Meyer, Kay, & French, 1965) concluded that how a goal is set is not as important as the fact that a goal is indeed set. In 1975, Latham and his colleagues initiated a series of studies designed to determine whether participation in setting goals would lead to higher goal commitment and performance than simply assigning goals to people. Latham and Yukl (1975b) found that participatively set goals led to higher performance than assigned goals among uneducated woods workers. This difference may have been due to the higher goals set in the participative condition, or it could have been due to commitment differences. Goal commitment, however, was not measured.

Subsequently, a series of nine (five field and four laboratory) experiments comparing participative and assigned goal setting were conducted. In eight cases, Latham and his colleagues found that when goal difficulty was held constant, there were virtually no differences in goal commitment or performance regardless of whether the goal was assigned or set participatively (Dossett, Latham, & Mitchell, 1979, 2 studies; Latham & Marshall, 1982; Latham, Mitchell, & Dossett, 1978; Latham & Saari 1979a; Latham & Steele, 1983; Latham, Steele, & Saari, 1982; Latham & Yukl, 1976). The exception to this finding was a laboratory study by Latham and Saari (1979b). However, the significant participation effect may have been cognitive rather than motivational because subjects in the participative condition asked for more clarification regarding task requirements than did subjects in the assigned goal condition.

In a replication of Latham and Saari's (1979a) study regarding supervisory supportiveness, Dossett, Cella, Greenberg, and Adrian (1983) found that goal difficulty and acceptance were the same for people with assigned and participatively set goals. They concluded that "participation seems to be unimportant for purely motivational purposes provided that difficult goals are set and accepted" (p. 9). In two field studies, Ivancevich (1976, 1977) also failed to find consistent differences in the effects of participative and assigned goals on various performance measures.

These null findings are consistent with reviews of the participation literature in general (Locke, Feren, McCaleb, Shaw, & Denny, 1980; Locke & Schweiger, 1979) and with literature reviews of participation in goal setting in particular (Latham & Lee, 1986; Latham & Yukl, 1975a; Schweiger & Leana, 1986). A meta-analysis of the goal-setting literature by Mento, Steel, and Karren (1987) focused on effect size rather than direction. A borderline effect of about 4% was obtained in favor of participation. Such a finding is considered trivial (Fowler, 1985). In another meta-analysis of goal-setting studies, Tubbs (1986) also found a negligible participation effect, even when goal difficulty was not held constant. Neither of these meta-analyses, however, included Erez's recent work (Erez, 1986; Erez & Arad, 1986; Erez & Earley, 1987; Erez, Earley, & Hulin, 1985).

A meta-analysis of the general pdm literature by Miller and Monge (1986) found that pdm is effective for complex tasks. A second, more painstaking meta-analysis (but one that also did not include the Erez studies) did not support this conclusion (Wagner & Gooding, 1987) and showed little evidence for the benefits of participation in general. The mean correlation for studies that did not involve percept–percept correlations was .108.

The view that participation in goal setting is crucial to goal commitment and, hence, to performance is articulated mainly by scholars Earley, Hulin, F. Kanfer, and R. Kanfer, who worked with Erez when she was on a previous sabbatical at Illinois.

Their orientation had its scientific roots in seminal research by Lewin (1943, 1951) and Coch and French (1948). The primary purpose of those early studies was to show how participation could be used to overcome resistance to change. Lewin (1943) conceived of participation as "a group discussion leading to a decision" (p. 63). He hypothesized that the motivational mechanisms underlying group participation were (a) involvement in goal setting, (b) an active approach to making decisions, (c) the achievement of consensus, and (d) public commitment to the final decision.

Resistance to goals has seldom been an issue in goal-setting studies (Locke & Latham, 1984). Nevertheless, the primary thesis of Erez and Kanfer (1983) was that "a goal is more likely to be accepted when it is not perceived as externally imposed" (p. 455). Empirical support for this assertion has been obtained by Earley (1985), Earley and Kanfer (1985), Erez (1986), Erez and Arad (1986), and Erez et al. (1985). In addition, these studies found significant relations between goal commitment and performance. It is noteworthy that Erez's procedures, as a package, produced a much wider range of goal commitment among various experimental groups than did those of Latham and his colleagues. For example, in Erez et al. (1985), the range in goal acceptance among subgroups ranged from 1.70 to 6.75 on a 7-point scale in the first study, and 4.20 to 6.50 in the second. In Erez and Arad (1986), the range was 3.58 to 5.79. In Erez (1986), it was 4.24 to 5.91. In contrast, the largest range reported by Latham within one study (on a 5-point scale) was 3.63 to 4.08 (Latham & Steele, 1983).

Earley and Kanfer (1985) cited the procedural justice literature to argue that opportunity for input provides the individual with perceived mastery or control over the situation, resulting in the enhancement of perceived fairness. Moreover, they claimed that individuals may experience a release of frustration during their "day in court" because of an increase in control over the process through which the outcome is generated. These two factors, they argued, explain why participation in setting a goal would affect goal commitment and performance.

In summary, on the basis of Lewin's (1951) early work, studies of overcoming resistance to change (e.g., Goodman, 1979; Perkins, Nieva, & Lawler, 1983), and her own experiments, Erez argued that when there are reasons to suspect that goal commitment may not be high, a goal is more likely to be accepted when people have a voice in setting it rather than when it is assigned to them.

Resolution

The first step in resolving the Erez–Latham dispute involved a meeting during which Erez and Latham, with Locke present, brainstormed differences in the two sets of experiments that might account for the differences in their results. Five hypotheses were generated initially.

1. Task importance. Latham, unlike Erez, stressed to his subjects in laboratory experiments that the experimental tasks were important ones. On the other hand, Erez believed that the tasks she used (e.g., simulated scheduling, evaluating job descriptions) were judged as less important than those typically used by Latham (e.g., brainstorming, real-life jobs). Participation may have had a greater motivational effect in the Erez experiments because there was little motivation provided by perceived task importance.

2. Group discussion. Latham's participative goal-setting conditions usually involved a dyad (e.g., a supervisor or experimenter and a subordinate or student). In contrast, Erez's participative conditions always involved group discussion. The experimenter discussed the goal to be set with groups of five or six people. In one study, Erez and Arad (1986) experimentally separated the effects of participation in setting the goal from those of group discussion about the goal (i.e., in the participation–no-group-discussion condition, the goal was set through secret ballots given to the experimenter). They found that both participation in setting the goal and group discussion of the goal had significant effects on both goal commitment and performance. Furthermore, the combination of the two produced a significant increment (interaction) over and above the additive effect. Consistent with these results, Matsui, Kakuyama, and Onglatco (1987) found that group goal setting (within groups of two) led to higher goal commitment and performance than did self-set goals.

3. Instructions. Everything that an experimenter does in an experiment does not always appear in the published article. In discussions between Erez and Latham concerning possible reasons for the differences in their results, they discovered that the instructions the two of them typically used in the assigned goal condition were quite different. Typical instructions used in laboratory experiments by Latham (e.g., Latham, Steele, & Saari, 1982) were as follows:

> Thank you for agreeing to participate in this study. Weyerhaeuser Company has employed us to _____. You are now familiar with the task. I would like you to do the following _____. This goal is difficult but attainable.

These instructions were given in a polite, friendly manner so that the experimenter was seen as supportive. Contrast this with the instructions typically given by Erez:

> Now that you have already had a practice session to get familiar with the task, you are asked to next attain a score of _____. You will have _____ minutes.

Three differences between these two sets of instructions may be significant: (a) Latham provided a rationale for why the task was an important one; (b) Latham provided a statement to the effect that the goal was reachable, using a *tell and sell* rather than only a *tell* approach; and (c) Latham stressed a warm and friendly rather than an abrupt tone (i.e., high supportiveness). Supportiveness was not measured in any of the Erez studies. Thus, it is possible that the differences in the results obtained by Erez and Latham are due to Erez's assigned condition working less well than Latham's, rather than Erez's participative condition working better than Latham's.

4. Setting self-set goals prior to the experimental manipulations. Erez et al. (1985) had half of their subjects set their own goals before the assigned or participative manipulation took place. They found that commitment to subsequent goals was higher in all cases when prior goals had *not* been set. This commitment difference did not affect performance, however, except among subjects in the participative condition (in which the commitment differences tended to be greatest). Subjects who

initially set their own goals may have been upset about being misled, especially when the new goals were very high. This finding might be interpreted as supporting the hypothesis that participation can help overcome resistance to change (Coch & French, 1948).

5. Value differences. Some, though not all, of Erez's studies have been conducted in Israel, a more collectivistic society than the United States (Hofstede, 1980). Thus, one might expect that participation in goal setting would be relatively more effective there than are assigned goals, as compared with the United States and Canada, where all of Latham's studies were conducted. Indirect evidence was provided for this hypothesis by Erez (1986), who found significant differences in the effects of degree of participation within Israel among subjects drawn from the private, Histradrut (trade union), and kibbutz (commune) sectors. Assigned goals produced greater goal commitment and performance in the private sector (which is relatively less collectivistic, as measured by Hofstede's items) than in the other two sectors. Participative goal setting was relatively more effective in the more collectivistic Histradrut and kibbutz sectors. Direct evidence was provided by Erez and Earley (1987), who tested the effects of participative goal-setting strategies on goal commitment and performance for American and Israeli students. They found that for the Israeli sample, assigned goals led to a significantly lower level of performance than did participatively set goals. The difference between the assigned and participative goals was not significant for the American sample. It may be noteworthy that, with one exception (Latham & Marshall, 1982), all of Latham's field experiments were conducted in the private sector.

In the course of conducting the experiments reported subsequently in this article, three additional factors were discovered that might have affected the results obtained in Erez's earlier work: (a) Erez used a two-phase design that included a drastic increase in goal difficulty in the second phase. Latham emphasized the use of goals that were difficult but attainable. (b) Self-efficacy instructions were given by Erez only to the subjects in the participative condition. Latham told all subjects that the goals were difficult but attainable. (c) Instructions were given by Erez to the subjects to reject goals with which they did not agree. This was not done in the Latham experiments.

A summary of the variables explored in the present studies is shown in Table 1. Note that participation values were measured across subjects but were not manipulated.

Table 1
Summary of Independent Variables Explored in Each Experiment

Experiment	Variable
1	Task importance, group decision,[a] and participation values[b]
2	Task importance,[c] group decision,[c] and participation values[c]
3	Tell vs. tell and sell vs. pdm instructions, set personal goals before manipulations vs. no-set, and participation values[b]
4	Tell vs. pdm instructions, self-efficacy instructions, instructions to reject goals, two-phase design with increasing goal difficulty, participation values[b]

[a] There was no individual decision comparison group. Previous studies were used as a comparison base.
[b] Participation values was an individual difference factor.
[c] Goal difficulty was increased.

Experiment 1

The primary purpose of the first study, conducted at the University of Washington, was to determine the effect of task importance on goal commitment and performance. As noted earlier, Erez argued that the tasks she typically used may have been seen as less important by the subjects than were those typically used by Latham. Moreover, Latham's previous research assistants had conveyed verbally and through tone of voice that the task activity was an important one, regardless of whether the subject was in a do-best or a specific goal condition. Erez hypothesized that participation may have had a greater effect on the motivation of subjects in her research because there was so little importance attached to the task itself.

A second purpose of this study was to determine (indirectly) the effect of group participation. With few exceptions (e.g., Latham & Yukl, 1975b), Latham's laboratory and field experiments involved participatively set goals in a dyadic (experimenter or supervisor paired with a subject or employee) situation. In the studies by Erez, the group rather than the individual set the goals. Thus, in this experiment, the subjects were run in groups of five to six. The goals were either assigned or set participatively within a group setting. It was agreed that if there were a main effect for group participation, a second study would be conducted in which group goal setting would be compared with dyadic goal setting.

A third purpose of this study was to see if people who value participation have greater goal commitment and higher performance when the goal is set in a participatory manner than do people who do not value participation in decision making.

Method

Subjects. Subjects were 94 first-year master of business administration (MBA) students, who were randomly assigned to one of six conditions. The subjects received 2 extra points on their final exam for participating in the study. The sample sizes for each condition are shown in Table 3.

Design. The experiment involved a 2 × 3 design. The task was conveyed by the experimenter as being either important (n = 47) or unimportant (n = 47). Subjects were assigned goals (n = 34), participated in setting the goals (n = 29), or were urged to do their best (n = 31) on the task.

Task. The experimental task in both instances consisted of individual's brainstorming uses for absorbent towels for 15 min, followed by 15 min of brainstorming uses for wood in any form. A person's score was the total number of ideas he or she generated in the two tasks.

The experimenter was a female MBA student who was unaware of the hypotheses of the research. Because former doctoral students (e.g., Saari, Steele) had conducted laboratory studies in the absence of Latham, the present experimenter, too, received minimal supervision beyond a written set of directions that had been prepared by Erez and approved by both Locke and Latham. In no instance did Latham meet with any subject. This has been the practice in all of Latham's labora-

tory experiments (i.e., Latham & Saari, 1979a, 1979b; Latham & Steele, 1983; Latham, Steele, & Saari, 1982).

Procedure. The experimenter visited the classroom to recruit subjects. Because more than 90% of the people chose to participate and the remainder were allowed to leave, the experimenter immediately ran a 2-min pretest to measure ability and to establish norms. The subjects were given standard brainstorming instructions (e.g., "no ideas will be criticized; piggybacking is encouraged"). They were then requested individually to brainstorm as many uses as possible for a rubber tire in 2 min.

At the end of the 2-min period, the data were collected and a 10-item questionnaire prepared by Erez and Locke was administered. The 7-point Likert-type items measured values pertaining to participation and authority (e.g., "employees should be extensively involved in the decisions made about their job"; "obedience and respect for authority are the most important virtues employees should have").

Using the performance premeasure, the subjects were matched across the six conditions on ability before being randomly assigned to one of six conditions. On a subsequent day they received the following instructions:

1. Do best, unimportant

> Thank you for agreeing to participate in this study. You are now familiar with the brainstorming task as it was done in class involving uses for a rubber tire. In the next 15 minutes, I would like each of you to please think of as many uses for an absorbent towel as you can. In the following 15 minutes, I will ask you to brainstorm uses for another item.

2. Participative, unimportant

> Thank you for agreeing to participate in this study. You are now familiar with the brainstorming task as it was done in class involving uses for a rubber tire. Today you will be participating in two brainstorming tasks, each of which lasts 15 minutes. Before getting started though, I would like the 5 or 6 of you to agree on a specific and challenging multiplier which each of you will then use to calculate an individual goal where Individual Goal = multiplier × number of ideas attained on the practice rubber tire task.
>
> Now you will need to set a multiplier for the first task in which you will try to think of as many uses for an absorbent towel as possible. Later, you'll set a multiplier for the second task. Past research indicates that others of your ability can generate _____× their practice score in the time allowed (15 minutes). Please take a few minutes to discuss this among yourselves and then come to an agreement on what all of you believe is a challenging, but realistic multiplier.

3. Assigned, unimportant

> Thank you for agreeing to participate in this study. You are now familiar with the brainstorming task as it was done in class involving uses for a rubber tire. Today you will be participating in two brainstorming tasks, each of which lasts 15 minutes. Before getting started, though, I would like each of you to calculate an individual goal by multiplying the number of ideas you attained on the rubber tire practice task by _____. Past research indicates that others of your ability can attain this goal.

The _____ was based on the multiplier set in the respective participative groups.

4. Do best, important

> Thank you for agreeing to participate in this study. You are now familiar with the brainstorming task as it was done in class involving uses for a rubber tire. Today you will be participating in two brainstorming tasks, each of which lasts 15 minutes.
>
> In the first exercise, Scott Paper Company located in Everett would like you to brainstorm uses for their new Job Squad absorbent towel. Here is a sample of both Scott Paper's Job Squad as well as a competitor's towel; you can feel the difference! In the next 15 minutes, please think of as many uses as you can for Job Squad.

At the end of the 15-min period, the people in the do-best/important condition were told the following:

> Now Scott Paper would like each of you to do your best to brainstorm uses of wood in any form. The reason for this is that Scott Paper wants to penetrate the Pacific Rim countries, especially with respect to China. In the next 15 minutes, please think of as many uses as you can for wood in any form.

Participative, important and assigned, and important instructions combined the relevant parts of the preceding instructions.

When the experimenter was asked questions in the task unimportant condition regarding the purpose of the study, she responded that she didn't know; she was simply a research assistant conducting a laboratory experiment. In the task important condition, she responded to any questions she received.

Measures. Following the manipulations, but prior to beginning the task, the subjects completed a three-item, 7-point Likert-type questionnaire on goal commitment (e.g., "How important is it to at least attain the goal that was set?" "To what extent will you strive to attain the goal that was set?"). The coefficient alpha was .84. In addition, the subjects completed a two-item, 7-point Likert type questionnaire on perceived participation in goal setting (i.e., "Compared to the experimenter in this study, I had considerable influence over the goal that was set"; "Compared to the experimenter in this study, the group members had considerable influence over the goal that was set") and a two-item, 7-point Likert-type questionnaire on task importance ("The task I will be working on is a very important one in that it involves helping a real organization perform an important function"; "The task I will be working on seems like a fairly routine clerical task with no real significance to me or anyone else," reverse scored). The coefficient alpha of these two measures was .90 and .88, respectively.

At the end of the experiment, the subjects completed an 11-item, 8-point semantic differential questionnaire asking them to rate the supportiveness of the experimenter toward them (e.g., pleasant–unpleasant, unfriendly–friendly). The coefficient alpha was .88.

Results

Manipulation checks. A 2 × 2 analysis of variance (ANOVA) on the perceived participation measure revealed a highly significant difference, $F(1, 56) = 41.12$, $p < .01$, between the participative ($M = 9.69$, $SD = 2.99$) and assigned conditions ($M = 5.03$, $SD = 2.61$).

Similarly, a 2 × 3 ANOVA for task importance revealed a significant effect, $F(1, 85) = 14.68$, $p < .01$, between the task important ($M = 9.64$, $SD = 2.20$) and unimportant conditions ($M = 7.74$, $SD = 2.42$).

There were no significant differences across conditions with regard to experimenter supportiveness. Perceived supportiveness was extremely high ($M = 78.15$ out of 88 maximum; $SD = 7.83$) overall.

Goal commitment. Despite the effectiveness of the manipulations of participation and task importance, goal commitment was relatively high and uniform across conditions. The results are shown in Table 2. None of the differences were significant. This restriction in range precluded a significant correlation between commitment and performance.

Performance. The results for performance, as defined by number of ideas, were not significantly different in the two 15-min blocks. Consequently, the results were collapsed across

Table 2
Goal Commitment by Experimental Condition in Experiment 1

Task importance	Goal condition	
	Participative	Assigned
Important		
M	5.17	5.37
SD	0.98	0.54
Unimportant		
M	5.44	5.31
SD	0.77	1.18

blocks. The mean totals are presented in Table 3. The subjects were matched on ability prior to being assigned to a group. Thus, ability could not differentially affect performance in the important or the unimportant conditions. Because of misunderstanding by the experimenter of the instructions from the senior author, the data could not be analyzed within a factorial design. In the task important conditions, the goals ($M = 39.17$, $SD = 9.06$) were based on the number of ideas generated in a 30-min period by the people in the comparable do-best condition; but, in the task unimportant conditions, the goals ($M = 84.14$, $SD = 6.99$) were based on prorated performance during the 2-min premeasure. Thus, the results are reported separately for the important and unimportant conditions.

A one-way ANOVA revealed a significant difference in the performance of the three groups in the task important condition, $F(2, 44) = 7.40$, $p < .01$, $\eta^2 = .25$. A planned t test showed no significant difference between performance in the assigned versus participative conditions. However, the combined assigned and participative groups were significantly better than the do-best group, $t(45) = 4.53$, $p < .01$.

When the task was perceived as unimportant, the F was also significant, $F(2, 44) = 22.86$, $p < .01$, $\eta^2 = .51$. Again, the difference in performance between those with assigned versus participatively set goals was not significant. And, both the participative, $t(28) = 7.44$, $p < .01$, and the assigned goal conditions showed higher performance than the do-best condition, $t(30) = 5.64$, $p < .01$.

The correlations between the score on the 10-item measure of value for participation with goal commitment and number of ideas generated did not approach significance.

Discussion

Experiment 1 strengthens the belief that it is not so important how a goal is set as it is that a goal has in fact been set. When goal difficulty is held constant and when the supportiveness of the experimenter is high, commitment and performance are the same in the participative and assigned goal conditions—even when the goals for the individual are set within a group, and regardless of the perceived task importance.

Unfortunately, the error in calculating the goals in this study made the results with respect to importance equivocal. The fact that the pattern of results in Tables 2 and 3 across rows were similar suggests that importance was not a key factor, but a more adequate test, of course, would allow the comparison between columns as well as rows (i.e., between all pairs of cells). Thus, a second study was undertaken in which the goals were set in the same way for all of the groups. Permission was obtained from the subjects to record their names so that the premeasure could be used as a covariate. Thus, ability was controlled in this second experiment both statistically and experimentally (i.e., matching). Experiment 2 also differed from Experiment 1 in that very hard or impossible goals were encouraged in the participative condition. This was done because in Experiment 1, 77% of the people attained their goal. In Experiment 2, the goal was 30% higher than the premeasure ability score prorated over 30 min. Consequently, only 21% of the people attained their goal. This procedure was followed because the authors noted that in the Latham experiments, the subjects/employees in the participative condition were requested to set a goal that they perceived as difficult but attainable, whereas in many of the Erez studies, especially in the second phase of her two-phase design, the goal was far out of reach. Thus, it was hypothesized that participation in setting the goal might be critical to goal commitment and performance only when very hard goals are set.

Experiment 2

Method

Subjects. Subjects were 64 full-time undergraduate business students, who received 2 extra points toward their final grade for participating in the experiment. They were matched and randomly assigned to one of six conditions. Sample sizes for each condition are shown in Table 5.

Design, task, procedure, and measures. The experimental design, task, procedure, and measures were identical to those for Experiment 1, except that in Experiment 2, goal setting was done in a consistent manner on the basis of an ability premeasure, and harder goals were set than in Experiment 1.

Results

Manipulation checks. The internal consistency of the questionnaire on the perceived participation in setting the goal was .98. A 2 × 2 ANOVA yielded a highly significant difference, $F(1,$

Table 3
Ideas Generated by Experimental Condition in Experiment 1

Task importance	Goal condition		
	Participative	Assigned	Do best
Important			
M	57.11	61.91	37.78
SD	16.06	25.31	11.81
n	14	17	16
Unimportant			
M	98.97	88.74	47.20
SD	23.67	27.07	12.91
n	15	17	15

Note. Performance factors can be meaningfully compared across but not down.

34) = 10.09, $p < .01$, between the participative (M = 8.78, SD = 3.07) and assigned (M = 5.55, SD = 3.08) conditions.

The internal consistency of the questionnaire on task importance was .78. A 2 × 3 ANOVA revealed a highly significant difference, $F(1, 58) = 60.36$, $p < .01$, between task importance (M = 10.59, SD = 1.58) and unimportance (M = 6.84, SD = 2.16).

The internal consistency of the measure of experimenter supportiveness was .86. No significant differences among conditions were found. The overall supportiveness mean was 82.56 (SD = 5.08).

Goal commitment. The internal consistency of the goal commitment measure was .95. The results are shown in Table 4. A 2 × 2 ANOVA yielded a significant main effect for importance, $F(1, 34) = 10.58$, $p < .01$, $\eta^2 = .19$; a main effect for goal condition, $F(1, 34) = 6.96$, $p < .05$, $\eta^2 = .12$; and an interaction effect between perceived importance and goal-setting conditions, $F(1, 34) = 4.23$, $p < .05$, $\eta^2 = .08$. These two main effects were clearly due to one outlier cell, namely, the relatively low goal commitment in the assigned, unimportant condition. A one-way ANOVA, $F(2, 25) = .81$, $p < .46$, $\eta^2 = .06$, revealed no significant differences among the participative important, participative unimportant, and the assigned important conditions. The t test between this outlier cell and the combination of the other three cells was significant, $t(36) = 4.76$, $p < .01$.[1] This indicates that it is the combination of perceived task unimportance and lack of participation that affects goal commitment. The correlation between goal commitment and performance, however, was not significant.

Performance. Results with regard to quantity of ideas produced across objects are shown in Table 5. A 2 × 3 analysis of covariance (ANCOVA) yielded a significant main effect, $F(2, 56) = 22.18$, $p < .01$, for goal setting only. A planned t test, $t(62) = 7.23$, $p < .01$, showed that specific goals—that is, assigned plus participatively set goals—resulted in performance that was significantly higher than the performance of the do-best groups. In the perceived task important condition, which is analogous to all the laboratory and field experiments conducted by Latham, there was no significant difference, $t(17) = 1.09$, *ns*, in the performance of those with assigned versus participatively set goals. Similarly, in the task unimportant condition, which is analogous to the Erez laboratory experiments, performance was not significantly different in the two goal-setting conditions.

Table 4
Goal Commitment by Experimental Condition in Experiment 2

Task importance	Goal condition	
	Participative	Assigned
Important		
M	5.81	5.63
SD	0.47	0.58
Unimportant		
M	5.44	4.00
SD	0.76	1.53

Table 5
Ideas Generated by Experimental Condition in Experiment 2, Adjusted Group Means

Task importance	Goal condition		
	Participative	Assigned	Do best
Important			
M	125.29	106.55	52.65
SD	41.96	37.36	25.50
n	9	10	13
Unimportant			
M	119.83	110.10	59.58
SD	43.89	49.90	17.90
n	9	10	13

Value for participation. At the suggestion of Erez, the value for participation questionnaire in Experiment 2 was treated as three independent scales. The first scale, which focused on preference for a tell versus a tell and sell style, contained two items (e.g., "I prefer a manager who usually makes decisions promptly, communicates them to subordinates and expects them to carry out the decisions loyally"). The alpha was .76.

The second scale, containing five items, focused on a preference for participation (e.g., "Employees should be extensively involved in the decisions made about their jobs"). The alpha was .64.

The third scale, containing three items, focused on authoritarianism (e.g., "Obedience and respect for authority are the most important virtues employees should have"). The alpha was .75. None of the scales correlated significantly with goal commitment or performance.

Discussion

Again, participatively set goals did not result in higher performance than did assigned goals, despite the fact that the goal for the individual was set within a group context. This was true regardless of whether the task was perceived as important or unimportant. Only the assignment of a goal in the task unimportant condition resulted in lower goal commitment than in the other conditions, but the commitment difference was not sufficiently large to translate into a performance difference. In fact, the larger, but nonsignificant, performance difference occurred within the task important condition. Thus, the hypotheses that the differences in results obtained by Latham and Erez could be explained by a difference in perceived task importance or in the use of individual versus group decisions were rejected.

[1] This analysis was suggested by Bobko (1986). It has aroused considerable controversy since being proposed. For example, it has been argued that it may lead to a Type II error. That is, the t test can be significant and the 1 × 3 analysis of variance (ANOVA) nonsignificant even when a genuine main effect exists. Bobko and others are now conducting Monte Carlo simulations to determine how frequently erroneous conclusions occur using his method and the traditional ANOVA interaction test when genuine main effects and genuine ordinal interactions exist. In the present case, it is clear from inspection of the means that there is no genuine main effect—only an outlier effect.

Similarly, there was no support for the view that value for participation differences among individuals moderate the effects of goal setting. Nor did increasing goal difficulty have any effect on the results except perhaps for decreasing the goal commitment of subjects in the assigned, unimportant task condition.

Experiment 3

The third experiment, conducted at the University of Maryland, compared the effects of the tell versus tell-and-sell versus pdm instructions. In addition, the effect of setting a personal goal (set/no-set) before being assigned a goal or setting one participatively, was examined. As in Experiments 1 and 2, value for participation was treated as an individual difference factor. Also, a number of additional manipulation checks were added.

Method

Subjects. Subjects were 135 members of various undergraduate business and management courses. All of the subjects received extra credit (1% added to grade) for participation.

Design. The design was a 2 × 3 (Set vs. No-set × Tell vs. Tell and Sell vs. Pdm) factorial, plus a do-best group. One subset of tell/no-set data had to be discarded because the experimenter inadvertently assigned the wrong goal, which resulted in the smaller sample in that condition. The sample sizes for each condition are shown in Table 7.

Task. The task was a course-scheduling task used previously by Erez et al. (1985). Subjects were given a page listing multiple sections for eight different courses. Their task was to construct nonconflicting schedules using, in each case, any section of any of five courses. The course, section number, and meeting time for each class were to be entered on blank class schedules. To minimize individual differences in task strategies, subjects were told in advance that they could form a new schedule simply by changing one section of one course. To give the task plausibility, subjects were told that the experimenters were interested in seeing how potential scheduling conflicts affect the number of options open to students. They were told that the results might be of interest to the campus administration.

The subject's total score was the number of completed, nonconflicting schedules. Credit was given for partially complete schedules (e.g., if a subject filled in three sections, credit would be given for .60 schedules).

The experimenter was a male MBA student who was assisted by a female doctoral student or a female undergraduate student.

Procedure. Subjects were scheduled in sessions of from 13 to 27 subjects each. All of the subjects in a given session received the same treatment. When the subjects arrived they were asked to sit together in subgroups of 4 to 6 people, so that all of the conditions were, in this respect, similar to the pdm condition.

Subjects were then asked to complete Questionnaire 1, which asked their opinions and preferences for employee participation in decision making. Next, they were given a preliminary task booklet that explained (supplemented by experimenter explanations) how to do the scheduling task. This was followed by a 10-min practice trial during which the subjects were told to complete as many schedules as they could.

Subjects in the set conditions were then asked to count how many schedules they had completed and to set and write down a personal goal for the 30-min work period that followed. No set subjects did not set a personal goal.

At this point, the remaining experimental manipulations took place. In all cases, the goal (assigned to both the tell and the tell-and-sell subjects and agreed to by the pdm subjects) was 6 times the practice trial score. This, it was assumed, equated goal difficulty for all of the subjects (as we shall see, this assumption was incorrect). The complete instructions to the tell subjects were as follows:

> Now that you have all completed the practice trial, we are ready to begin the main task. In the next 30 min I would like each of you to complete _6_ times as many schedules as you completed on the practice trial. Calculate and then write your goal on top of work booklet B where it says "goal." Please write the multiplicator first, and multiply it by the number of schedules you did in the practice trial, then write down the total number of schedules you are going to make in the next 30 minutes. For example, if your score was 3 you should write the following: 6 × 3 = 18.

The instructions to the tell-and-sell subjects included the tell instructions plus a rationale for why the goal in the experimental trial was harder proportionately than the practice trial performance level.

> Now that you have completed the practice trial, we are ready to begin the main task. I am going to start by setting a goal for you as to how many units you should try to get done during the 30 minute work period that we have today. Your score on the practice trial, which lasted 10 minutes, was ____ units. Prorating this across the 30 minute work period that you will have would suggest an expected score of 3 × your practice score or ____ schedules. However, people improve on this task with the practice and also get momentum when working continuously for a longer time period. Thus, we would expect that you could do considerably better than this score during the 30 minute work period. Our pilot research has indicated that college students can score _6_ × their practice score in the time allowed. Calculate and then write your goal for the next 30 minutes on top of work booklet B where it says "goal." Please write the multiplicator first, and multiply it by the number of schedules you did in the practice trial, then write down the total number of schedules you are going to make in the next 30 minutes. For example, if your score was 3 you should write the following: 6 × 3 = 18.

The pdm groups were given the same instructions as the tell-and-sell subjects. In addition, they were asked to discuss the goal and decide what they thought was a reasonable goal. If the group deviated from the suggested goal of 6, the experimenter attempted to nudge the group toward 6, but ultimately went along with the group decision. The full instructions to the pdm groups were as follows:

> Now that you have all completed the practice trial, we are ready to begin the main task. We are going to start by jointly setting a goal as to how many units you will try to get done during the 30 minute work period that we have today. Your score on the practice trial, which lasted 10 minutes, was ____ units. Prorating this across the 30 minute work period that you will have would suggest an expected score of 3 × your practice score or ____ schedules. However, people do improve on this task with practice and also get momentum when working continuously for a longer time period. Thus, we would expect that you could do considerably better than this score during the 30 minute work period. Our pilot research has indicated that college students can score _6_ × their practice score in 30 minutes.
>
> What goal do you think would be a good goal for each individual member of your group? Please make a group decision for the goal that would seem reasonable for each individual in your group to pursue in the next 30 minutes. You are allowed as a group to discuss your goal for 5 minutes. Do not discuss it with other groups. Check your decision with me, then write it down, and I'll come by and look at it.
>
> The goal should be set in terms of the multiplicator, or how many times your practice score you will try for.
>
> After you check with me, write your goal on top of work booklet B where it says "goal." Please write the multiplicator first, and multiply it by the number of schedules you did in the practice trial, then write down the total number of schedules you are going to make in the next 30 minutes. For example, if your group decision is to

Table 6
Manipulation Checks: Means and Standard Deviations in Experiment 3

		Perceived participation		Perceived brevity		Task importance		Task interest		Experimenter supportiveness		Experimenter nonautocratic style		Compliance	
Condition	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Tell	34	3.42	1.81	4.05	1.33	3.71	1.61	3.17	1.30	4.62	1.25	3.63	1.63	5.39	1.35
Tell and sell	54	3.86	1.35	3.19	1.38	3.68	1.52	3.40	1.46	4.03	1.37	3.49	1.84	5.58	1.19
Pdm	47	4.97	1.32	3.46	1.26	3.88	1.36	4.04	1.35	5.98	1.00	4.84	1.31	5.54	1.19

Note. Pdm = participation in decision making.

have a multiplicator of 6, and your practice score was 3, you should write the following: $6 \times 3 = 18$.

The do-best subjects were simply told to do as many schedules as they could in 30 min. Before starting to work, the subjects were asked to complete Questionnaire 2, which asked about perceptions of influence, brevity in instructions, conflict of instructions, the meaningfulness of setting personal goals first, task importance, goal commitment, and self-efficacy.

At the end of the experiment, subjects filled out Questionnaire 3, which asked them to rate the experimenter's supportiveness on a semantic differential scale and to rate task interest and attitudes toward compliance with the experimenter.

Measures. The value-for-participation questionnaire was broken down into three parts as described in Experiment 2. The alphas were preference for tell, .80; preference for participative management, .76; and authoritarianism, .68.

The second questionnaire also assessed the following perceptions using a 7-point Likert-type format: perceived participation (same items as in Experiments 1 and 2, $\alpha = .79$, perceived brevity (e.g., "The instructions regarding goals were given so fast that I could barely follow what was going on;" 3 items; $\alpha = .74$), conflict (e.g., "Setting a goal first and then being asked to change it put me in a state of conflict;" 3 items; $\alpha = .73$), task importance (same as in Experiments 1 and 2; $\alpha = .70$), goal commitment (same as in Experiments 1 and 2; $\alpha = .87$), self-efficacy magnitude (subjects indicated whether they could complete 4, 8, 12 . . . 40 schedules in 30 min; the magnitude score was the total number of yeses), and self-efficacy strength (for each of the 10 performance levels, 4, 8, 12 . . . 40, subjects indicated on a scale from 0 to 100 their degree of confidence in being able to reach that level; the strength score was the sum of the 10 confidence ratings).

The third questionnaire contained semantic differential items that were divided into two a priori groups: supportiveness (same as in Experiments 1 and 2; $\alpha = .95$) and autocratic (e.g., "Treated you as an equal"; $\alpha = .69$).

Also measured with 7-point scales were the following: task interest (e.g., "It was interesting to work on this task", 2 items; $\alpha = .39$) and compliance (e.g., "Students who participate in an experiment should comply with the assignments set for them by the experimenter", $\alpha = .66$).

Results

Manipulation checks. The manipulation effect of participation was measured by the items pertaining to perceived influence on setting the goal. In addition, the goal-setting conditions were compared with respect to subjects' perceptions of brevity of instructions, task importance, task interest, the experimenter's supportiveness, and autocratic style. The means and standard deviations for the manipulation checks are presented in Table 6.

The following significant effects were found, using independent t tests to compare groups. Participation: Tell versus pdm, $t = 4.08$, $p < .001$; and tell and sell versus pdm, $t = 4.08$, $p < .001$. The tell and tell-and-sell conditions were not significantly different, $p > .05$. Brevity: Tell versus pdm, $t = 1.98$, $p = .05$; tell versus tell and sell, $t = 2.85$, $p < .01$; and tell and sell and pdm were not significantly different, $p > .05$. Task importance did not significantly differ across experimental conditions. Task interest: Tell versus pdm, $t = 2.89$, $p < .01$; tell and sell versus pdm, $t = 2.24$, $p < .01$; and tell versus tell and sell were not significantly different, $p > .05$. Experimenter supportiveness: Tell versus pdm, $t = 5.17$, $p < .01$; and tell and sell versus pdm, $t = 7.74$, $p < .01$. Tell versus tell and sell were not significantly different, $p > .05$. Experimenter's autocratic style: Tell versus pdm, $t = 3.54$, $p < .01$; tell and sell versus pdm, $t = 4.03$, $p < .01$; and tell versus tell and sell were not significantly different, $p > .05$.

In sum, the tell groups experienced less perceived participation, less task interest, less supportiveness, greater brevity of instructions, and more experimenter autocracy than did the pdm groups. The tell-and-sell groups were typically either intermediate between the tell and pdm conditions or closer to the tell condition.

There were no significant effects of the set/no-set manipulation on any of the preceding measures. The mean score for perceived conflict between personally set and subsequently set goals for the set condition was 3.98 ($SD = 1.10$) on a 7-point scale.

The means and standard deviations of value for participation were as follows: Preference for tell, $M = 5.76$, $SD = 1.09$; preference for pdm, $M = 5.23$, $SD = .99$; and authoritarianism at work, $M = 4.63$, $SD = 1.09$. The mean for compliance with the experimenter's assignment was $M = 5.71$ and $SD = .99$. There were no significant effects of any of these or any other attitudes on performance.

The mean ability score for the sample was 3.07 schedules in the practice trial. Using a multiplicator of 6, the mean goal level was 18.5. On the average, 35% of the subjects were able to attain their goals.

Commitment and self-efficacy. Descriptive statistics for goal commitment, self-efficacy, and performance are presented in

Table 7
Means, Standard Deviations, and Adjusted Means of Variables by Experimental Conditions for all Subjects in Experiment 3

Condition	Ability			Commitment		Self-efficacy strength			Performance		
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*	Adjusted means[a]	*M*	*SD*	Adjusted means[a]
Tell/set	21	3.13	1.66	4.85	0.68	306.77	192.96	312.24	15.17	8.85	15.37
Tell/no-set	13	3.15	1.08	5.04	1.30	431.53	220.90	418.53	16.09	7.29	15.62
Tell and sell/set	27	3.67	1.50	4.81	1.08	503.33	213.90	462.10	17.76	5.88	16.26
Tell and sell/no-set	27	2.53	0.68	5.74	0.65	400.65	206.84	441.32	13.13	3.82	14.61
Pdm/set	24	2.87	1.43	5.49	1.00	396.04	162.71	412.05	14.69	4.79	15.27
Pdm/no-set	23	3.24	1.21	5.72	0.93	518.13	145.08	507.61	17.18	5.01	16.80
Combined											
Tell	34	3.14	1.45	4.95	1.00	363.48	208.14		15.59	8.17	
Tell and sell	54	3.11	1.29	5.27	1.04	452.96	214.75		15.49	5.46	
Pdm	47	3.05	1.33	5.30	0.95	454.43	164.79		18.88	5.00	
Set	72	3.25	1.54	5.17	1.24	424.59	197.43		16.09	6.61	
No-set	63	2.92	1.03	5.56	0.97	453.00	191.84		15.13	5.37	

Note. Pdm = participation in decision making.
[a] Controlling for ability.

Table 7, and the results of the ANOVAs and ANCOVAs are summarized in Table 8.

The results of the first ANOVA in Table 8 demonstrated significant effects for goal-setting condition ($p < .01$) and set/no-set condition ($p < .01$) on goal commitment. Using independent t tests to compare the three goal-setting conditions, we found that commitment was significantly higher in the pdm and tell and sell than in the tell condition ($t = 2.45$, $p < .01$). There were no significant differences between tell-and-sell and pdm conditions. Commitment of subjects in the no-set condition was significantly higher than that in the set condition.

Table 8
Analysis of Variance for Commitment, and Analyses of Covariance (Controlling for Ability) of Self-Efficacy Strength and Performance by Goal Setting and Set/No-Set Conditions in Experiment 3

Source of variance	*MS*	*df*	*F*	η^2
Commitment				
Goal-setting treatments	4.31	2	4.77**	.06
Set/no-set	8.52	1	9.45	.06
Interaction	2.01	2	2.23	
Constant	3776.08	1	4187.67**	
Within cells	0.90	128		
Self-efficacy strength				
Goal-setting treatments	109,884.32	2	3.96*	.04
Set/no-set	85,991.81	1	3.10	
Interaction	53,808.16	2	1.94	
Ability	1102,612.92	1	39.76**	
Constant	836,858.00	1	30.18**	
Within cells	27,728.99	125		
Performance				
Goal-setting treatments	4.37	2	0.18	.00
Set/no-set	0.15	1	0.00	
Interaction	28.36	2	1.22	
Ability	1463.97	1	61.22**	
Constant	1094.52	1	45.76**	
Within cells	23.91	125		

* $p < .05$. ** $p < .01$.

The results of an ANCOVA controlling for ability (Table 8) demonstrated a significant effect ($p < .05$) for goal-setting treatments on self-efficacy strength. Self-efficacy strength indicated the level of confidence subjects had in performing at different levels of difficulty. It was significantly higher in the pdm than in the tell condition ($t = 2.36$, $p < .01$) and significantly higher in the tell and sell than in the tell condition ($t = 1.94$, $p < .05$). There were no significant differences in self-efficacy strength between the tell-and-sell and pdm conditions.

Performance. Prior to the ANCOVA, the homogeneity of beta coefficients for the covariate (ability) was tested and a significant difference was found among the groups ($p > .05$). For this reason, the analysis was done separately for high- and low-ability groups, as well as for the total sample. For the total sample, there were no significant effects for goal-setting treatments or set/no-set condition and performance (Table 8).

Commitment, self-efficacy, and performance data for the low-ability subjects are shown in Table 9. The ANCOVA results for performance (controlling for ability) are summarized in Table 10. There was a significant effect for goal-setting condition on performance ($p < .05$). However, performance in the pdm and tell and sell were not significantly different ($t = 1.14$, $p > .05$). Both of these conditions showed higher performance than did the tell condition, one significantly and one marginally (tell vs. pdm, $t = 2.71$, $p < .01$; tell vs. tell and sell, $t = 1.66$, $p < .10$).

The intervening effects of commitment and self-efficacy strength on the relation between goal-setting conditions and performance were tested by ANCOVA. The results demonstrated (see Table 10) that the significant effect of goal-setting conditions on performance disappeared when ability, self-efficacy strength, and commitment were controlled ($p > .05$). Ability by itself did not affect performance in the low-ability sample, thus indicating that self-efficacy and commitment were the mechanisms responsible for the performance effect. There were no

Table 9
Means, Standard Deviations and Adjusted Means of Variables by Experimental Conditions for Low-Ability Subjects in Experiment 3

	Variable								
	Commitment			Self-efficacy strength			Performance		
Condition	*n*	*M*	*SD*	*M*	*SD*	Adjusted means[a]	*M*	*SD*	Adjusted means[a]
Tell/set	8	5.16	0.59	192.22	160.67	226.77	10.13	4.15	10.12
Tell/no-set	6	4.55	1.72	398.33	212.17	386.51	10.43	2.00	10.44
Tell and sell/set	11	4.72	0.93	397.54	265.42	378.70	13.93	6.18	13.93
Tell and sell/no-set	17	5.82	0.72	362.00	172.94	358.73	12.05	3.80	12.05
Pdm/set	14	5.19	0.98	340.93	125.62	349.42	13.56	4.90	13.55
Pdm/no-set	11	5.69	1.05	482.64	152.48	473.91	15.36	4.44	15.37
Combined									
Tell	14	4.90	1.19	274.66	187.93		10.25	3.36	
Tell and sell	28	5.39	0.96	375.96	210.06		12.78	4.85	
Pdm	25	5.41	1.02	403.66	152.94		14.35	4.70	
Set	33	5.22	1.41	332.58	186.51		12.77	5.27	
No-set	34	5.56	1.12	411.41	175.59		12.83	4.13	

Note. Pdm = participation in decision making.
[a] Controlling for ability.

significant effects of the experimental treatments on performance ($p > .05$) for the high-ability subjects.

The adjusted mean performance score of the do-best subjects (controlling for ability) was significantly lower than that of each of the other conditions: Do best = 12.03; tell = 14.83, $F(1, 61) = 20.44$, $p < .01$; tell and sell = 14.83, $F(1, 74) = 34.00$, $p < .01$; and pdm = 15.40, $F(1, 72) = 67.94$, $p < .01$.

Discussion

Results of the study showed that commitment was higher in the tell-and-sell and pdm conditions than in the tell condition, and it was higher in the no-set than in the set condition. The former result confirms the hypothesis that the explanation for the difference in findings between the Latham and Erez studies would not be found in the methods by which participative goals were set, but rather in the methods by which assigned goals were administered. In this replication of Erez's previous work, Latham requested that manipulation checks be included on experimenter supportiveness, autocratic style, and brevity. All of the checks showed significant differences among conditions. Consistent with Latham's previous research, Experiment 3 showed that there was a significant difference in perceived participation in setting a goal between the tell-and-sell and the pdm conditions. The tell and tell-and-sell conditions did not differ in this regard. Among all of the manipulation measures, these latter two groups differed significantly only in brevity of instructions to subjects.

Table 10
Analyses of Covariance of Performance Before and After Controlling for Ability, Self-Efficacy, and Commitment by Goal-Setting and Set/No-Set Conditions for Low-Ability Subjects in Experiment 3

Source of variance	*MS*	*df*	*F*	η^2
a. Performance				
Goal-setting conditions	77.79	2	3.70*	.11
Set/no-set	0.00	1	0.00	
Interaction	21.48	2	1.02	
Ability	0.01	1	0.00	
Constant	577.17	1	27.46**	
Within cells	21.01	61		
b. Performance				
Ability, commitment, self-efficacy strength	59.63	3	3.16*	.10
Goal-setting conditions	30.09	2	1.59	.04
Set/no-set	16.63	1	0.88	
Interaction	13.17	2	0.70	
Constant	67.71	1	3.58	
Within cell	18.87	58		

* $p < .05$. ** $p < .01$.

Most important, the results showed that there was a significant effect for goal-setting treatments on self-efficacy strength; the tell condition showed significantly lower self-efficacy strength than did the tell-and-sell and pdm conditions. The reason for this difference is not hard to discover if one examines the experimental instructions. Following procedures previously used by Erez and her colleagues, subjects in the present tell-and-sell and pdm conditions were told that they could be expected to improve on the task as a result of practice (learning) and gaining momentum, whereas subjects in the tell condition were given no such persuasive encouragement. With self-efficacy strength held constant across the tell-and-sell and pdm conditions, goal commitment and subsequent performance in the two conditions were not significantly different.

The goal-setting effect on performance for the sample as a whole, although nonsignificant, could not be tested because of the heterogeneity of the beta coefficients for the covariate (ability). When the data were broken down by ability level, a significant performance difference emerged for the low-ability sub-

jects, but not for the high-ability subjects. The lack of a significant effect for the high-ability subjects could reflect a ceiling effect on performance in that improvement where scores are already very high is very difficult. The method of calculating the goal as 6 times the performance level one obtained during the practice session resulted in very difficult goals for the high-ability groups. On the other hand, the goals for the low-ability subjects were attainable. In fact, 55% of the low-ability subjects and only 19% of the high ability subjects were able to attain their goals. A ceiling effect, therefore, would not limit the performance of low-ability subjects.

An additional explanation of the results for the low-ability subjects could be as follows. Overall there was a correlation between ability and self-efficacy strength ($r = .50$, $p < .01$, for all subjects). Thus, subjects with low ability will on the average have lower self-efficacy than those with high ability. This means that the low-ability subjects may be generally less confident and therefore less motivated than the high-ability subjects. However, the persuasive instructions used for the tell-and-sell and pdm groups partially counteracted this low self-efficacy. Because no such instructions were given to the tell groups, there was no counteracting effect, and they performed more poorly as a result. This finding suggests that the instructions given to the tell-and-sell and pdm subjects played an important role in the results.

To summarize, the ceiling effect for the high-ability subjects, the low range of commitment induced by the instructions, and most important, the deliberate biasing effect of self-efficacy instructions in the tell-and-sell and pdm conditions, but not in the tell condition, may explain the present findings. These issues were considered when we designed the next and final experiment.

Experiment 4

One purpose of Experiment 4 was to separate the effect of participation as such from the effect of increasing self-efficacy that was embedded in the previous pdm condition. For this reason, an additional pdm condition without the instructions for increasing self-efficacy was included; thus, the specific statements indicating that individuals get momentum and improve with practice were eliminated.

Because Experiment 3 had made it clear that the important difference between the research conducted by Erez and Latham was due to the brevity of the tell instructions and the embedding of self-efficacy instructions in the pdm condition, rather than to differences between the tell-and-sell and pdm conditions, the tell-and-sell condition was dropped from Experiment 4.

In addition, we wanted to replicate the wide range of commitment previously attained by Erez and her colleagues. By talking to Earley, the experimenter in the Erez et al. (1985) study, we learned that he had encouraged subjects to reject their assigned goals if they did not agree with them. Because we originally had only the published instructions to go by, we had not incorporated this oral instruction into Experiment 3.

Another possible way to increase the range of goal commitment was to increase the level of goal difficulty in line with the procedure used by Erez et al. (1985). Thus, the subjects performed the task in two phases. For the tell subjects, Phase 1 entailed moderate goals, namely 5 times as many work schedules as were done in the 10-min practice trial. Phase 2 entailed difficult goals, namely 8 times as many work schedules as were done in the practice trial. On the basis of a pilot study, about 30% of the subjects were expected to reach their goals in Phase 1, whereas fewer than 5% were expected to succeed in Phase 2. In actuality, the success rate for all subjects was 61% in Phase 1, and 52% in Phase 2. (Later in the article the reason for this discrepancy is discussed.)

Method

Subjects. Subjects were 28 undergraduates from business and management courses. Again, they received extra credit (1% grade bonus) for participation.

Design. The design was a 1×3. The three conditions were as follows: tell ($n = 9$), pdm/no self-efficacy ($n = 7$), and pdm with self-efficacy ($n = 12$). Unlike Experiment 3, no personal goals were set.

Task. The task was the same one used in Experiment 3, namely, making class schedules.

Procedure. Experiment 4 differed from Experiment 3 in the following ways: First, there were two phases of 20 min each, rather than one 30-min phase. The assigned goal for Phase 1 was 5 times as many work schedules as were done in the practice session; for Phase 2, the goal was 8 times as many. Second, at the beginning of the experiment, all subjects were told the following:

> This experiment involves a scheduling task and filling out questionnaires. We ask that at all times, you give your honest opinion to the questions you will be asked. It is important that your goals and performance in the exercise reflect how you actually feel about what you are doing. If you do not approve or accept something in the experiment, you should say so in the questionnaires.

At the end of the experimental manipulation instructions, all subjects were told the following:

> We often receive goals that are unreasonably difficult or too easy, and deep down we reject those goals. We would like you to give your honest opinion to the questions you will be answering. For example, in question x, if you do not accept the goal because it is too difficult or too easy, a low score on the scale is expected. On the other hand if you accept the goal, a high score is expected.

Third, subjects in the pdm/no-self-efficacy condition were asked to participate in goal setting, but unlike subjects in the pdm condition, they were not told that they could get momentum and improve with practice.

Measures. Questionnaires 1 and 2 were the same as in Experiment 3. Questionnaire 2 was administered before each of the two phases. Questionnaire 3 was administered at the end of Phase 2.

Results

Manipulation checks. Perceived participation in goal setting was significantly ($p < .01$) higher in the two pdm conditions than in the tell condition, in both Phases 1 and 2. The mean scores were as follows: Phase 1, tell: 3.05 ($SD = 1.65$), pdm/no self-efficacy: 5.78 ($SD = 0.93$), pdm: 5.33 ($SD = 0.98$); and Phase 2, tell: 3.28 ($SD = 1.77$), pdm/no self-efficacy: 5.78 ($SD = 0.92$), pdm: 5.46 ($SD = 0.86$). The t ratio between tell and pdm for Phase 1 was 3.96, $df = 19$, $p < .01$; and for Phase 2, $t = 3.37$, $p < .01$. The t ratio between tell and pdm/no self-efficacy for Phase 1 was 3.79, $df = 14$, $p < .01$; and for Phase 2,

Table 11
Means, Standard Deviations, and Adjusted Means of Variables by Experimental Conditions in Experiment 4

Condition	*n*	Ability M	Ability SD	Commitment *M*	Commitment *SD*	Self-efficacy magnitude *M*	Self-efficacy magnitude *SD*	Self-efficacy magnitude Adjusted means[a]	Self-efficacy strength *M*	Self-efficacy strength *SD*	Self-efficacy strength Adjusted means[a]	Performance *M*	Performance *SD*	Performance Adjusted means[a]
Phase 1														
Tell	9	3.27	1.66	5.11	1.18	4.11	1.17	3.78	433.22	196.74	385.52	8.18	4.39	6.53
Pdm/NoSe	7	3.27	0.77	5.66	0.54	2.57	0.97	2.78	255.28	129.07	286.65	6.48	1.49	7.56
Pdm	12	2.32	1.66	5.92	0.60	4.25	1.96	4.37	379.83	183.40	397.31	8.66	2.74	9.27
Pdm + pdm/NoSe											7.86	2.55	8.66	
Phase 2														
Tell				4.03	1.39	3.22	1.78	2.88	323.66	211.41	282.88	9.24	4.22	7.69
Pdm/NoSe				5.76	0.69	1.71	0.48	1.93	195.71	65.53	222.53	9.08	3.20	10.10
Pdm				5.19	1.52	3.58	1.38	3.20	319.16	131.74	334.11	9.38	2.61	9.95
Pdm + pdm/NoSe												9.27	2.76	10.00

Note. Pdm = participation in decision making; Se = self-efficacy.
[a] Means adjusted for ability differences.

$t = 3.72$, $p < .01$. There were no significant differences between the two pdm conditions. No significant differences were found among treatments on any other manipulation variable (perceived brevity, task importance, task interest, experimenter supportiveness, experimenter autocratic style, and compliance).

Commitment and self-efficacy. The mean scores and the adjusted mean scores (controlling for ability) for self-efficacy are shown in Table 11. The ANOVAs and ANCOVAs are shown in Table 12. The ANOVAs indicated a significant effect of goal-setting treatments on commitment for Phase 2 ($p < .05$); the effect was only marginal ($p < .10$) for Phase 1.

Self-efficacy magnitude was significantly affected by goal-setting treatments in Phase 2 ($p < .03$), but only marginally in Phase 1 ($p < .10$). The pdm/no-self-efficacy group showed lower self-efficacy magnitude than the pdm group in Phase 1 ($t = 2.50$, $p < .05$) and Phase 2 ($t = 2.77$, $p < .05$). Self-efficacy strength was not significantly affected by goal-setting treatments.

Performance. The means and adjusted means (controlling for ability) for performance are summarized in Table 11, and the relevant ANCOVAs are shown in Table 12. Overall, the results demonstrated a significant effect for goal-setting treatment on performance in Phase 1 ($p < .01$) and a marginal effect in Phase 2 ($p < .10$). In Phase 1, the pdm with self-efficacy group outperformed each of the other two groups. Performance was significantly higher for the combined pdm conditions than the tell conditions in both phases.

When goal commitment and self-efficacy magnitude were partialed out, along with ability, the effect of goal-setting treatments on performance was reduced in Phase 1, but reduced to nonsignificance only in Phase 2 (see Table 12). Thus, goal commitment and self-efficacy partially mediated the relation between participation and performance.

Significant correlations ($p < .05$) among the questionnaire items and between these items and performance were obtained as follows: Perceived brevity was negatively correlated with perceived participation in Phase 2 ($r = -.45$), and with commitment in Phase 2 ($r = -.38$). Perceived participation and commitment were positively associated in both phases ($r = .49$, and .59, respectively). Performance in Phase 1 was negatively associated with brevity only ($r = -.29$). Performance in Phase 2 was positively related to perceived participation ($r = .42$) and commitment ($r = .34$) and negatively related to brevity ($r = -.44$). A plausible causal sequence, at least for Phase 2, is as follows: tell instructions → brevity and low perceived participation plus very high goals → low commitment → low performance.

Discussion

In support of the results of Experiment 3, the difference between the tell and pdm conditions was significant with respect to both commitment and performance. In Experiment 4, however, these results occurred for all of the subjects, not just for the low-ability half. This can be explained by the refusal of all (including high-ability) subjects in the pdm conditions to set very high goals. In fact, they set similar goals to the goals in Phase 1. In Phases 1 and 2, 61% and 52% of the subjects, respectively, were able to attain their goals. Hence, the goals were moderate in both phases.

The range of goal commitment attained (4.03 to 5.92) was the largest of any of the four experiments—enough to make a difference in performance. (A difference almost as large as this, however, had no performance effect in Experiment 2.) The results may have been enhanced by instructions urging subjects to reject goals with which they did not agree. We did not, however, attain the extreme range in commitment achieved in some of the earlier Erez studies.

The results were enhanced by the use of a two-phase design for commitment but not for performance. Although the performance effects of pdm were greater in Phase 1, the commitment effects of pdm were greater in Phase 2, when at least the tell subjects had harder goals and lower commitment.

The effects of self-efficacy instructions were noticeable, with the pdm/no-self-efficacy group showing lower self-efficacy in both phases and lower performance in Phase 1 than the pdm group with self-efficacy instructions.

Goal commitment and self-efficacy magnitude mediated the relation between goal-setting strategies and performance. When

Table 12
Analysis of Variance of Commitment and Analyses of Covariance of Self-Efficacy Magnitude and Performance (Controlling for Ability) by Goal-Setting Treatments in Experiment 4

Source of variance	Phase 1				Phase 2			
	MS	*df*	*F*	η^2	*MS*	*df*	*F*	η^2
Commitment								
Goal-setting treatments	1.69	2	2.50	.17	6.41	2	3.65*	.23
Constant	876.59	1	1259.45**		690.03	1	392.82**	
Within cells	0.67	25			1.75	25		
Self-efficacy magnitude								
Goal-setting treatments	5.52	2	2.58	.20	7.02	2	4.22*	.22
Ability	7.45	1	3.48		7.98	1	7.98*	
Constant	28.98	1	13.53**		13.38	1	8.04**	
Within cells	2.14	24			1.66	24		
Performance								
Goal-setting treatments	18.33	2	7.30**	.13	13.76	2	2.99	.10
Ability	190.79	1	76.86**		169.07	1	36.82**	
Constant	15.28	1	6.16*		54.23	1	11.81**	
Within cells	2.48	24			4.59	24		
Performance								
Goal-setting treatments (assigned vs. combined pdm)	23.93	1	8.27**	.09	27.42	1	6.21*	.10
Ability	199.09	1	68.83**		169.36	1	38.38**	
Constant	13.53	1	4.68*		54.79	1	12.42**	
Within cells	2.89	25			4.41	25		
Performance (controlling) ability, commitment and self-efficacy magnitude								
Ability, commitment self-efficacy magnitude	55.48	3	26.71**		62.55	3	15.02**	
Goal-setting treatments	9.89	2	4.04*	.04	3.82	2	0.92	.01
Constant	0.15	1	.06		0.64	1	0.15	
Within cells	2.45	22			4.15	22		

* $p < .05$. ** $p < .01$.

the two variables were partialed out, the goal-setting effect was significantly less in Phase 1 and disappeared in Phase 2.

The goal-setting effects on commitment and on self-efficacy magnitude were greater in Phase 2 than in Phase 1. This may be explained by the greater difference in goal difficulty between the tell and the two participative groups in Phase 2, as opposed to Phase 1. Subjects in the participative conditions of Phase 2 refused to set the high multiplicator of 8 that was assigned to the tell group. They set a multiplicator for themselves similar to the one in Phase 1. The low goal level of the pdm subjects compared with the tell subjects may also have limited the performance effect in Phase 2.

Overall Summary of Results

The key results of the four experiments are summarized in Table 13 in terms of the eight factors hypothesized to affect the outcomes, plus a ninth factor, goal difficulty, that subsequently entered into two of the experiments.

Task importance seemed to have little effect. In Experiment 1, it did not significantly affect goal commitment or task performance. In Experiment 2, it again did not significantly affect performance. There was a goal commitment main effect, but as shown earlier, this was due solely to the interaction. We can infer that group decision making was not important because the essentially null findings of Experiments 1 and 2 replicated those obtained previously by Latham using one-on-one participation. Goal difficulty might have played a role in getting a commitment difference between participatively set and assigned goals in Experiment 2 within the task unimportant condition, but this difference did not affect performance. In Experiment 4, commitment did drop considerably for the tell group in Phase 2—the one group that raised its goals. This occurred even as performance improved. However, the performance effect of the experimental manipulations was actually stronger in Phase 1, when the goals were easier. Thus, we conclude that goal difficulty may have had some effect on the results, but not a major one.

We believe that the tell versus pdm difference is the major causal variable that explains the results; we consider it to be the single most potent factor in this set of experiments. In Experiments 1 and 2, there was virtually no difference in the effect of pdm versus assigned goals when the goals were assigned in Latham's usual tell and sell style. In contrast, in Experiments 3 and 4, there were consistent differences between the tell and pdm groups in both commitment and performance (except for the performance of the high-ability subjects in Experiment 3). In contrast, the tell and sell condition (Experiment 3) did not differ significantly from the pdm condition in either goal commitment or performance.

Table 13
Summary of Results in Experiments 1–4

Variable	Experiment	Effect: Little or no effect	Effect: Some effect (e.g., commitment but not performance)	Effect: Large effect (e.g., commitment and performance)
Task importance	1, 2	X		
Group decision	1, 2	X		
High goal difficulty	2, 4		X	
Tell vs. other instructions	3, 4			X
Set/no-set	3		X	
Participation values	1, 2, 3, 4	X		
Two-phase design	4	X		
Self-efficacy instructions	3,[a] 4		X	
Instructions to reject goals	4		X	

[a] Not manipulated separately from participation in decision making.

The set versus no-set distinction showed an effect on goal commitment in Experiment 3. This effect, however, was not substantial enough to bring about a significant difference in performance. Thus, this effect must be considered at best a modest one.

There was no effect of value for participation on goal commitment or performance in any of the four experiments. Thus, it must be inferred that within the range of values or preferences found among American college students, attitudes toward participation do not seem to make any difference. One cannot conclude from this, however, that value differences between cultures do not make any difference in determining the effectiveness of participation inasmuch as such effects have already been found by Erez (see discussion ahead).

The use of a two-phase design was intended to produce increased goal difficulty in Phase 2. But, as we noted earlier, although the tell groups had harder goals in Phase 2 than in Phase 1, the pdm groups did not. Overall, the better results with respect to performance in Phase 1 were counterbalanced by the better results for commitment in Phase 2. Thus, we cannot claim any effect for the two-phase design as such, separated from the issue of goal difficulty which has been discussed previously.

The self-efficacy instructions given to the pdm subjects in Experiment 4 gave them a clear edge over the pdm subjects who were not given such instructions, with regard to perceived self-efficacy and actual performance. The effect on self-efficacy held for both phases. The performance effect, however, was only present in Phase 1. Self-efficacy also may have played a role in Experiment 3.

The instruction to reject disliked goals was not manipulated separately. Nevertheless, it can be inferred to be of importance in that the tell/pdm differences in commitment and performance in Experiment 4 were greater than the corresponding tell/pdm differences in Experiment 3.

In conclusion, the results of these studies can be summarized as follows: variables of major importance—tell versus other instructions; variables of moderate importance—high goal difficulty, set/no-set instructions, self-efficacy instructions, and instructions to reject goals; and variables of minor or no importance—task importance, group decision, participation values, and two-phase design.

Concluding Remarks: Latham

Conducting the present series of studies was as exciting as it was illuminating. It was science at its best. It involved systematically reviewing one another's studies, formulating hypotheses, arguing over proper procedures for testing hypotheses, implementing the procedures, re-implementing the procedures, analyzing the data, and reanalyzing the data because someone thought of an alternative statistical test.

My initial belief that the early findings of Erez and her colleagues were atypical with regard to the effectiveness of assigned goals, was based on the ease with which goal commitment is obtained in most goal-setting studies (Locke & Latham, 1984). Furthermore, given that our social system depends to a large extent on responsiveness to authority and involves thousands if not millions of such episodes each day, responsiveness should be considered the norm and nonresponsiveness the exception.

That Erez and I are in agreement on this issue is evident elsewhere (Locke, Latham, & Erez, 1988). We were aware that the relation between goal commitment and compliance had been discussed 50 years ago by Barnard (1938). Individuals will comply with an assignment if (a) they understand what is being asked, (b) they believe the assignment is consistent with organizational goals and with their own personal interests, and (c) they are mentally and physically able to comply with the assignment. Barnard coined the concept *zone of indifference,* within which assignments will be accepted by a person without question. In almost all goal-setting studies, except those of Erez and her colleagues, assigned goals appear to have remained in the subject's zone of indifference. It was my hypothesis, based on conversations with the late Rensis Likert, that this zone of indifference is a result of adherence to the principle of supportive relations. This principle, which is independent of participation in decision making (Likert, 1967), may explain why Wexley and Baldwin (1986) found that relative to the control condition, both assigned and participatively set goals were equally effective in bringing about transfer of training as measured 2 months after

a training program. Prior to the present series of experiments, neither Erez, Earley, nor R. Kanfer measured experimenter or supervisory supportiveness.

Erez and I are also in agreement that from a motivational standpoint, tell-and-sell goals are as effective as participatively set goals. This agreement is based on her replication in Study 3 of the findings obtained in my previous research. However, when brevity or curtness is not held constant across conditions and when attempts to increase self-efficacy occur in one condition but not the other, the condition in which curtness is minimized and self-efficacy is enhanced will result in greater goal commitment. Note that in Experiment 4 the pdm/no-self-efficacy condition resulted in the same level of performance in Phase 1 as did the tell condition. Influencing self-efficacy is a likely indicator of supervisory supportiveness, whereas curtness and brevity are strong indicators of the opposite.

Erez and I remain in disagreement over the importance of obtaining a main or interaction effect for goal commitment as in Experiment 2. For me, such a finding is of statistical, but not practical significance, unless a concomitant finding occurs for performance.

Erez and I also remain in disagreement over the practical—although not the theoretical—importance of her two-step model. To me, encouraging people to reject goals is an experimental contrivance. The value of the two-step model is theoretical rather than applied in that it allows a demonstration of the effect of goal commitment on performance. This has been difficult for other researchers to show because of the high degree of goal commitment that occurs in most field and laboratory settings, regardless of the method by which the goal is set. The value of the present series of experiments is that it revealed the methodological confounds that explain why Erez got findings different from mine. More important, these four experiments confirm the finding that assigned goals that are set in a supportive climate are as effective as goals set participatively in the same climate.

Erez and I are in agreement that the process by which the present series of experiments was conducted is as important as the outcome, because the process is replicable. It provides a straightforward way of discovering the reasons for different outcomes obtained by different investigators. Critical to the success of this process are cognitive, affective, and behavioral components of the people who implement it.

From a cognitive standpoint, there must be genuine curiosity for an explanation of the difference and a willingness to consider every possible reason for the difference. From the standpoint of affect, one must be willing to admit error. In addition, one must be willing to test hypotheses and use procedures that one does not necessarily believe in, but which are endorsed by the other two parties. The choice of a mediator is arguably the most critical component of the three. Investigators must agree that this third person is a nonpartisan supporter of both parties and would do nothing to hurt their reputations. Furthermore, both the mediator's integrity and expertise must be beyond question by both of them. Erez and I are in agreement that Locke more than satisfied these criteria.

In summary, the present series of experiments indicate that when goal difficulty is held constant, when attempts to enhance self efficacy are held constant, when there is not undue brevity, and when artifacts such as telling subjects to reject goals are eliminated, the motivational effects of assigned goals are as effective as participatively set goals in generating high commitment and performance. This conclusion is in agreement with a recent study by Shalley, Oldham, and Porac (1987), who also found that within a given goal difficulty level there were no significant differences in commitment or performance between individuals who were assigned goals and those who set them participatively. Thus, the aforementioned factors (e.g., brevity, self-efficacy, telling people to reject goals) cannot be viewed as boundary conditions, but rather as confounding variables in that they were present only in Erez's previous participative conditions. Such confounding variables need to be eliminated before one can reach conclusions regarding culture as a variable that mediates the motivational effects of participative versus assigned goals.

Concluding Remarks: Erez

The present research makes a major contribution to our knowledge of the process of resolving scientific disputes and also to our knowledge of the phenomenon of pdm. The first and unique contribution is the development of a constructive process for resolving scientific disputes on an empirical basis. The process is generalizable and applicable to a wide variety of research areas. Typically, disagreements on scientific issues lead the disputants to attack one another in the literature and at professional and scientific meetings. In the present case, the two antagonists, together with a mediator, jointly formulated hypotheses to explain the inconsistencies, designed the studies, and collected and analyzed the necessary data.

Several conclusions can be drawn from the process:

1. Scientific disputes can be resolved on an empirical basis by a joint collaboration of the antagonists together with a mediator.

2. The process helps define the boundary conditions for the predictions made by the antagonists. For example, participatively set goals were more effective than goals assigned by using a tell style. However, no differences were observed between the participatively set goals and goals assigned by using the tell-and-sell style.

3. The collaboration process is not a zero-sum game. In fact, both sides gain from the process because it helps to define the specific conditions necessary to validate their predictions.

4. The present study demonstrated the influence of contextual variables on individuals' responses to goal-setting procedures. For example, high commitment to assigned goals was obtained when goal difficulty was moderate and the task was highly important. In contrast, commitment to assigned goals was lower when the goals were difficult and the task was not important, although this difference had no effect on performance.

5. The process brings into focus the fact that very often researchers are unaware of contextual effects because they are part of the context and have no external reference point. By working together, the two antagonists provided for each other the reference point needed to define the unique characteristics of each other's procedures.

6. The present research illuminates the impact of the re-

search method on the results and conclusions. Very often, the method section in scientific journals appears in small letters, and the readers tend to skip over it and jump into the results section and conclusions. Sometimes all that has been done in the experiment is not even in the method section. Future research should more carefully analyze the results in light of the specific methodology used in the study. The aforementioned arguments suggest that contextual factors may become key explanatory variables in resolving scientific disputes.

The second contribution of the study is to the content area of pdm. Commitment was a key variable for explaining the inconsistencies between Erez's and Latham's results. In Latham's research, goal commitment was commonly high and invariate, whereas in Erez's studies there was a wide range in commitment among the various groups. Therefore, the identification of the factors responsible for the differences in commitment helped to resolve the controversy.

Instructions were found to have the most significant effect on goal commitment and, consequently, performance. The pdm with self-efficacy instructions, as compared with the tell style, strengthened the perceived influence that subjects had over the goals and reduced the perceived brevity of the information communicated to them. Perceived brevity was negatively related to goal commitment, and perceived influence was positively related to it. Latham commonly used the tell-and-sell style for the nonparticipative strategy, whereas Erez used the tell style. Experiments 3 and 4 demonstrated that the pdm and the tell-and-sell styles had similar effects on goal commitment and performance. The significant differences were between the tell and the tell-and-sell conditions. Differences in commitment but not performance were observed when goal difficulty was extremely high and the task was perceived as unimportant, as in Experiment 2.

Several conditions were found to facilitate the effect of pdm on goal commitment: The effect was more significant when goal difficulty was high, when the task was not perceived as important, when subjects had to change previously set personal goals, when pdm subjects were told they would do well, and when they were told that they did not have to accept assigned goals. All of these conditions existed in Erez's but not in Latham's studies.

One might argue that encouraging people to reject disliked goals is an artifactual experimental manipulation in that it has no counterpart in real-life situations. In contrast, I argue that compliance with the experimenter's instructions is an experimental artifact.

In real-life situations there are many cases in which employees are required to change previously assigned goals, or to follow goals that are not in line with their personal aims. In such cases, employees are more likely to reject the goals assigned to them. The instructions given in the present study simulated the occurrence of such real-life situations.

I conclude that pdm is most effective when the situational characteristics are the least favorable for goal commitment. Such situational factors were identified in the present set of experiments and they explain previous differences between Erez and Latham.

Finally, it is suggested that the perception of the situation as favorable or unfavorable for goal commitment, the preference for the pdm style, and even the relation between goal commitment and performance, may be subject to cultural differences. Participation in decision making may have a different effect in the United States and Canada than in some of the European countries or in Israel. As was noted earlier, Erez and Earley (1987) found that culture moderated the effect of pdm on performance. The more collectivistic Israeli groups reacted adversely to assigned goals, and performed significantly lower in the assigned than in the participative goal-setting condition. On the other hand, the individualistically oriented American students attained a similar level of performance in both the pdm and the assigned goal condition. Additional research evidence on the moderating effect of culture is summarized by Erez (1986) and Erez and Earley (1987).

Concluding Remarks: Locke

To begin my remarks I would like to extend my sincerest compliments to my co-authors who put themselves on the line in the name of science. Remarkably, despite the ego-threatening nature of this cooperative enterprise, I rarely had to assert my authority as mediator and never in any major way. In designing the experiments and measures (e.g., manipulation checks), suggestions from one party were readily accepted by the other party. Similarly, in writing up the experiments, although there was a lively exchange of ideas and some initial differences of opinion as to what the results meant, we had little trouble agreeing on the data analyses and on the content of the manuscript. In the concluding sections, each party emphasized somewhat different aspects of the experiments, but still a broad core of agreement remained. All of us did extensive editing of the final version, but again, most editorial suggestions were readily agreed to by the other parties.

From the point of view of the experiments themselves, what struck me the most was the number of differences in procedure and design that can occur when two people are allegedly studying the same phenomenon. In this case there were at least nine differences in the procedures or designs of the Erez and Latham studies. Some of these were quite subtle (e.g., self-efficacy instructions). Many were not evident from reading the printed version of the studies (e.g., differences between tell and tell-and-sell instructions; telling subjects to reject disliked goals). If such differences occurred in these studies, one can assume that they also must occur in studies of other phenomena.

This presents somewhat of a dilemma to journal editors. They could require that every single word that was said to the subjects be included in the method section so that other researchers would know exactly what was said. On the other hand, this goes somewhat against the constant pressure from editors to make manuscripts as succinct as possible. Our results suggest that there might be a net gain to science if the extra length were allowed and even encouraged in the name of completeness.

Another finding that struck me as a result of these studies was how a number of little differences between studies can add up. There was one major difference between the Erez and Latham studies (i.e., tell instructions), but there were also four smaller differences that together seemed to make an impact (i.e., self-efficacy instructions, instructions to reject goals, set/no-set, and goal difficulty). All of these differences worked in the direction

of spreading out the degree of goal commitment between groups.

Of these differences, telling subjects to reject disliked goals seems to me to be the most clearly artifactual manipulation, in that this is something a manager would never say to an employee. As a way of trying to induce a greater range of goal commitment, there is nothing wrong with it. But such an instruction cannot be said to have much external validity because the same person would virtually never tell people to try for a goal and then tell them not to try for it. Thus, I would not agree with Erez that compliance is an experimental artifact. I believe that most organizations are run on the basis of the assumption of compliance, and that noncompliance, whereas an important phenomenon, is more the exception than the rule, especially considering the negative consequences that may stem from it (e.g., firing, criticism, and denial of raises and promotion).

The self-efficacy instructions to the pdm groups were clearly a biasing factor in that they were not given to the tell groups. However, self-efficacy instructions in themselves are clearly not artifactual. On the contrary, self-efficacy appears to be an extremely important determinant of performance on tasks and of the effectiveness of goal setting (Bandura, 1986; Locke, Frederick, Lee, & Bobko, 1984). Thus, such instructions should be given to all subjects if the goal is to maximize performance. It might be argued that pdm would naturally lead to higher self-efficacy than would tell instructions, but that is not what happened in Experiment 4. In fact, the tell groups without self-efficacy instructions had as high self-efficacy as did the pdm groups with self-efficacy instructions, and higher self-efficacy than did those pdm groups without self-efficacy instructions.

Contrary to the conventional wisdom that letting people have a say or make choices leads to greater feelings of self-control and thereby better performance, it may be that telling people what goals to try for is in itself an indirect means of inducing self-efficacy, especially when the goals are high. This argument has been made by Salancik (1977) who asserted that "the statement of a specific goal . . . implies that the person is capable of achieving the goal" (p. 30). See also in this regard Locke et al. (1988). Psychologists have perhaps been overly influenced by the cliché that self-control or choice is good; therefore, any procedure that increases choice automatically increases commitment and performance. Social–cognitive theory (Bandura, 1986) would argue that choice in the absence of self-efficacy would not lead to high performance and could even lead to increased stress, in that people will be faced with the need to cope with situations that they cannot handle. Thus, procedures that increase subject choice should be most successful when combined with additional procedures that promote self-efficacy with respect to the task in question.

We do not believe that these experiments, either alone or in combination with those done previously, represent the last word on the subject of the motivational effects of participation. Our manipulations were designed to replicate the actual levels of the variables used by Erez and Latham, not the full range possible. For example, in Experiment 4, subjects were told to reject goals that they disagreed with, whereas in Experiment 3, they were not told to do this. This manipulation could be made more extreme, (e.g., some subjects could be encouraged to reject disliked goals, as in Erez & Zidon, 1984, whereas others could be told that accepting and trying for them was extremely important). Similarly, the effects of self-efficacy-reducing instructions (which were not used) could be compared with instructions designed to increase efficacy (which we gave to one group in Experiment 4). The range of goal difficulty could also be made greater than it was in our studies.

However, I have long believed that the motivational benefits of participation are potentially far less powerful than its cognitive benefits (e.g., in generating good ideas for work improvements and work methods). Unfortunately, very few studies of the cognitive effects of participation have been conducted to date (exceptions include Campbell & Gingrich, 1986, and Erez & Arad, 1986). The design of the present series of experiments themselves were, interestingly, an example of the cognitive benefits of joint decision making or pdm.

Some might argue that these experiments lack external validity because they were conducted in a laboratory setting. To take one example, group decisions in real work settings are typically made for the group as a whole rather than for the individual members. On the other hand, a recent extensive review of research studies in organizational behavior and human resource management concluded that the results of laboratory studies (including studies of goal setting and of pdm) generalize quite well from the laboratory to the field (Locke, 1986). This suggests, at least, that no a priori judgments as to the superiority of one setting over another should be made.

Although the present series of studies may not constitute the last word on the topic of participation in goal setting, we do believe that they have added to our knowledge of the phenomenon. Most important, they have identified, at least to our satisfaction, the major causes of the differences between the results obtained by Latham and Erez. We attribute this success in large part to the method we used: the joint design of the crucial experiments by the antagonists, using a third-party mediator.

It remains to speculate as to the general applicability of this method and as to the conditions under which the method will work successfully. Generally, we believe that the method is applicable any time the following conditions are present.

First, we believe that the disagreement must be accompanied by a lack of full knowledge of the procedures followed by each party in conducting his or her experiments. This is something we did not anticipate at the outset, but it is probably the case that many experiments are reported without every relevant detail being included in the write up. The only way to discover such omissions is through joint collaboration.

Second, we believe that there should be a third party whom both antagonists trust and respect, so that if differences of opinion do occur in the process of designing studies or analyzing the data, they can be resolved. The mediator in this case did not ever have to become heavy-handed, but he did have to make some decisions and to ask each party to reconsider certain opinions and conclusions.

Third, the differences between the antagonists cannot be too deep or too much at the philosophical level. In such cases, the antagonists would probably not be able to agree on what variables to study, how to operationally define them, or how to interpret the results when they emerged, regardless of what they were. For example, it is unlikely that a die-hard behaviorist and a firm believer in the cognitive approach to psychology could

successfully collaborate to resolve their differences, because the differences are not primarily scientific.

Fourth, the antagonists must have a strong scientific curiosity and an honest desire to discover the truth, rather than being concerned primarily with protecting their pet theory against attack. Their self-esteem must be based on using the correct process to discover knowledge, rather than on getting the desired outcome (e.g., being right). They must be willing to look at the facts objectively.

We believe that these conditions were met in the present endeavor. It is our hope that other investigators will try the method we have used where applicable and that in doing so they will add to our knowledge more efficiently and more rapidly than would otherwise be the case.

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