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Performance Effects of Motivational State: A Meta-Analysis

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Researchers (e.g., Butler, 1987; Elliott & Dweck, 1988; Grolnick & Ryan, 1987) have recently studied the impact of two different motivational states and have hypothesized that attempting to attain mastery (learning goal) leads to better performance than attempting to demonstrate that one has high ability (performance goal). This article presents a meta-analysis of research in which motivational states are manipulated and confirms that learning goals lead to better performance than do performance goals. The results also indicate that the learning goal advantage may be limited to relatively complex tasks and that the learning goal advantage is smaller for young children than for older individuals. Further, the learning goal advantage was larger when learning goals were moderately pressuring and when participants were tested alone. Theoretical integration of various theories of motivation and practical implications of the findings are discussed.

Social psychologists have been interested in describing how different types of motivation might lead to varied performance outcomes. Researchers involved with intrinsic motivation (e.g., Deci & Ryan, 1985), ego involvement (e.g., DeCharms, 1968; Nicholls, 1984), and achievement goal theories (e.g., Elliott & Dweck, 1988) have all proposed theories which describe how the induction of different motivational states may lead to disparate responses to task demands and consequently to different performance outcomes. These theories share a distinction between two major classes of motivational states: an intrinsic motivational state, in which individuals are focused on learning and mastering task skills, and an extrinsic motivational state, in which individuals feel pressured and are focused on demonstrating that they have high ability. Researchers from all three of the aforementioned theoretical traditions argued that intrinsic or learning motivation leads to flexible, creative responding that allows a focus on the task at hand and consequently to better performance, at least for some kinds of tasks. On the other hand, they argue that the more extrinsic motivational state leads to feelings of pressure, distraction from task engagement, and deteriorated performance. In this article, research from intrinsic motivation, ego involvement, and achievement goal theory is brought together and the main hypothesis that the induction of learning/intrinsic motivation may lead to superior performance than the induction of extrinsic/performance motivation is tested by meta-analysis. In addition, meta-analytic techniques are also used to test potential mediators and moderators of the performance effects of the two types of motivation.

One research tradition that has distinguished between different motivational states is intrinsic motivation theory. Deci and Ryan (1985), in their statement of intrinsic motivation theory, built on the work of White (1959), who argued that humans have an innate need to develop competence through interacting effectively with their environment, a motivation he termed "effectance." Deci and Ryan added a need for autonomy (self-determination) to the desire for competence in describing intrinsic motivation. Deci and Ryan argued that when intrinsically motivated, individuals attempt to stretch their abilities and derive enjoyment from such a challenge. In addition to leading to interest in the task at hand and enjoyment of the process of task engagement, Deci and Ryan also argued that intrinsic motivation leads to greater creativity, flexibility in responding, and spontaneity. They contrasted intrinsic motivation with extrinsic motivation, in which individuals are said to be motivated by goals, rewards, and evaluations that are external to the task itself. That is, when extrinsically motivated, individuals are not focused on mastery and skill development, but rather, feel compelled to behave or achieve by external forces. Such a state, Deci and Ryan claimed, would lead to greater feelings of pressure and less creative, flexible, and spontaneous behavior and would undermine any intrinsic motivation that would otherwise be present.

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Deci and Ryan's (1985) conception of intrinsic motivation focused mainly on the level of interest, pressure, and enjoyment that follow from intrinsically motivated behavior. Further, much intrinsic motivation research has focused on persistence on the task during a free choice period as its main dependent measure. Nonetheless, there are some studies in the intrinsic motivation tradition that investigate performance outcomes and suggest that the induction or support of intrinsic motivation may lead to better performance than does the induction of extrinsic motivation, at least on some tasks. Benware and Deci (1984) found that having participants read an article about brain functioning in order to teach it to another student (intrinsically motivated learning) led to better performance on conceptual test questions than did instructions to read the article in order to perform well on a test (extrinsically motivated learning). However, they found that performance on rote recall questions was unaffected by the motivational inductions. Similarly, Grolnick and Ryan (1987) found that students directed in a noncontrolling way (in order to foster intrinsic motivation) to read text materials performed better on conceptual essay questions about the text than did students who had been given controlling, test-like instructions (designed to foster an extrinsic orientation). As in the Benware and Deci (1984) study, Grolnick and Ryan found that intrinsic and extrinsic conditions did not lead to a performance difference on a simple performance measure: rote recall. Thus, although intrinsic motivation theory has been mainly concerned with experience of enjoyment and persistence engendered by the state of intrinsic motivation, there is some evidence in the literature that performance on some tasks is better under intrinsic than under extrinsic motivation conditions.

A related research tradition that has focused on classes of motivation is ego/task involvement. DeCharms (1968), in discussing perceptions of personal causation, claimed that people who felt themselves to be "origins" of their own behavior were relatively engrossed in whatever task in which they were engaged, whereas people who felt themselves to be "pawns" perceived that they were forced by external factors such as evaluation to "produce or else" (p. 342). DeCharms argued that an origin state could arise from individuals being given task-orienting instructions, which focuses individuals away from evaluation and onto the task itself, whereas a pawn state could arise from ego-orienting instructions, which focuses individuals on evaluation. Similarly, Nicholls (1984) defined *ego involvement* as a state in which individuals feel pressured to demonstrate that they have high ability, and *task involvement* as a state in which individuals are relatively unconcerned with evaluation, instead focussing their attention on the task. Nicholls argued that ego involvement could arise from a conception of intelligence as being measurable only in relation to the performance of one's peers, whereas task involvement could arise from a belief that individuals might measure their abilities by self-improvement and thus would be relatively unconcerned with comparing themselves to others. Nicholls reviewed research which suggested that ego-involved individuals, compared to task-involved individuals, felt more concerned with social comparison, felt less interest in tasks, and that when individuals perceive they have low ability on a task, ego involvement produces poorer performance than does task involvement.

Consistent with ego/task involvement theory, Graham and Golan (1991) found that when participants were given task-involving instructions (see the task as a challenge and enjoy mastering it) they performed better on deep level processing recall tasks than did participants given ego-involving instructions (task performance will give an indication of how good you are compared to others your age). However, consistent with the results obtained in intrinsic motivation research, there was no difference between ego- and task-involved participants in how they performed on a simpler, shallow processing task (rhyming memorization). Butler (1988) similarly found an advantage for task-involving comments over ego-involving comments in performance on a creative task (generating uses), but found no such advantage for task-involving comments for a more mechanical, rote task for individuals who were high achievers in school (high-ability group).

As Butler (1988) noted, ego/task involvement research has much in common with intrinsic motivation research. Task-involved individuals appear to be focused on the development of competence that is at the center of the intrinsic motivation state, whereas ego-involved individuals are apparently interested in demonstrating that they have high ability relative to others, a goal external to performing the task itself, similar to an extrinsic motivational state. Both research traditions argue that the task-involved/intrinsically motivated individual derives more satisfaction from effortful engagement in the task and feels that his or her actions are self-determined to a greater extent than individuals who are ego-involved/extrinsically motivated. Further, both research areas have provided some evidence that, under certain circumstances, task involvement/intrinsic motivation may lead to better task performance than does ego involvement/extrinsic motivation.

A newer research tradition that is similar to intrinsic motivation and ego/task involvement research is the achievement goal theory associated with Dweck and her colleagues (e.g., Dweck, 1986; Elliott & Dweck, 1988). Dweck (1986) reviewed motivation research and argued that examining different types of achievement goals as "cognitive mediators" was the best way to understand how external contingencies lead to differing motivational states and performance. Rather than merely describe a motivational state and then the consequences that flow from it, Dweck emphasized trying to understand the goal that the individual has in mind in the achievement situation. Dweck and her colleagues argued that a focus on self-improvement results in learning goals, under which "individuals seek to increase their ability or master new tasks" (Elliott & Dweck, 1988, p. 5). They argued that a focus on capacity (which can be judged by comparison to the performance of others) leads to performance goals, under which "individuals seek to maintain positive judgments of their ability and avoid negative judgments by seeking to prove, validate, or document their ability and not discredit it" (Elliott & Dweck, 1988, p. 5). Further, they argued that these goals would result in attainment differences in that performance goals leave individuals "vulnerable to the helpless response in the face of failure, setting up low ability attributions, negative affect, and impaired performance," whereas learning goals promote a "mastery-oriented response to obstacles: strategy formulation, positive affect, and sustained performance" (Elliott & Dweck, 1988, p. 5).

Achievement goal theorists argue that situations can be constructed so that they lead either to a focus on capacity (performance goal) or to a focus on task mastery (learning goal). Elliott and Dweck (1988) argued that the induction of learning goals should lead to better performance than would the induction of performance goals when individuals are faced with the possibility that they might not be successful at the task. They found that individuals who received feedback on a pretask that indicated they might have low ability on the main task (pattern matching) showed deteriorated performance in a performance goal condition relative to a learning goal condition.

Thus, the results and theorizing of achievement goal theorists appears to be consistent with those of intrinsic motivation and ego/task involvement theorists. Research in all three areas suggests that pressure to perform well may result in relatively low task enjoyment and debilitated performance, whereas a focus on self-improvement seems to be relatively enjoyable and leads to good performance. Therefore, combining the research of these three areas provides a good basis for investigating the claim that intrinsic motivation/task-involvement/learning goals may lead to better performance than do extrinsic motivation/ego-involvement/performance goals. Although all three areas do make claims about performance, ego/task involvement and learning/performance goal theorists make more specific predictions about performance outcomes than do intrinsic motivation researchers. Further, learning/performance goal theorists provide a conceptualization of the two different classes of motivation that, although similar to those in the other two research traditions, specifies the distinct end states toward which individuals work (viz., a goal of "learning" vs. a goal of "performing well"). Therefore, in this meta-analysis, we will refer to the two classes of motivational states as learning goals (which will include intrinsic motivation and task-involvement conditions) and performance goals (which will include extrinsic motivation and ego involvement conditions).

Basic Predictions of Learning/Performance Goal Theories

To test the hypothesized effect of the induction of learning goals relative to the induction of performance goals, a meta-analysis was conducted to bring together relevant findings from the aforementioned research areas. Based on the prior research, it was predicted that the induction of learning goals would lead to better performance than would the induction of performance goals. If such a learning goal advantage was obtained in a meta-analysis of relevant research, it would support the theorizing of the aforementioned researchers and would demonstrate the generality of the effect over many different tasks and situations.

The research reviewed previously provides evidence for task complexity as a moderator of the learning goal advantage. Although achievement goal theorists have not discussed the effect of complexity on learning and performance goal inductions, some of the other research noted previously has done so. For example, Grolnick and Ryan (1987) found that intrinsic motivation conditions conferred an advantage only for relatively complex, conceptual essay questions, but not for the simpler rote recall questions. Similarly, Graham and Golan (1991) found that task involvement led to better performance only for word memorization that had taken place at a deeper level of processing (i.e., categorization and sentence level meaning) but not for words memorized by the relatively simplistic method of rhyming. Graham and Golan argued that these results may have occurred because task involvement helps mainly when a task requires a great deal of effort, as is the case when the task is difficult. In addition, Butler and Nisan (1986) found that performance on a task which they described as algorithmic or quantitative was not affected by an ego/task involvement manipulation, whereas for a heuristic or qualitative task, task involvement did lead to better performance than did ego involvement. These results are consistent with Deci and Ryan's (1985) statements that intrinsic motivation may lead to greater creativity and flexibility in responding. Such creativity and flexibility may be more beneficial when the experimental task is complex than when it is simple. Therefore, it was predicted that the learning goal advantage would be relatively large when the task is complex and smaller or nonexistent when the task is simple or rote.

The case for age as a moderator of the effects of motivational states is also supported by the aforementioned research. Nicholls (1978, 1984) reviewed research supporting the notion that young children are not able to conceive of ability as capacity relative to others, rather, they perceive ability as being self-referenced (in terms of self-improvement). Similarly, Ruble and her colleagues have provided evidence (e.g., Boggiano & Ruble, 1979; Ruble, Boggiano, Feldman, & Loebl, 1980) that young children (less than 7 to 8 years old) are not particularly influenced by or interested in comparisons of their ability to that of others. Both Nicholls and Ruble argued that young children's failure to use relative comparisons is not due to absolute lack of the ability to do so. Instead, they argued for a developmental sequence that suggests that as children grow older they will become more sensitive to external comparisons of ability.

This reasoning provides a basis for the prediction that age will moderate the learning goal advantage. If performance goals result in debilitated performance due to a concern with performing well vis-à-vis others, then younger children, who are less able or willing to make relative comparisons, should be less impaired by performance goal inductions than older children. Thus, this meta-analysis includes tests of how age affects the learning goal advantage. If such tests indicate that younger children are relatively less debilitated by performance goals (i.e., smaller learning goal advantage) they would be consistent with the arguments of Nicholls (1984) and Ruble and her colleagues (e.g., Boggiano & Ruble, 1979), that sensitivity to relative performance information (as in a performance goal) is something that develops only as children become older. Further, such results would support the notion that concerns with social comparison are related to the hypothesized debilitation of performance predicted for performance goal inductions.

As a way of investigating what factors might underlie the hypothesized learning goal advantage, it is possible to relate the influence of elements of achievement goals to the magnitude of the effect. Based on the aforementioned literature, it was predicted that learning and performance goals differ along two important dimensions. First, as Nicholls (1984) argued, under learning goals individuals choose to measure progress against their own performance (self-referenced standard of comparison), whereas under performance goals, individuals choose to measure themselves against the performance of others (externally-referenced standards of comparison). Similarly, in intrinsic motivation theory (e.g., Deci & Ryan, 1985), intrinsic motivation (learning goals) is characterized by development of competence, which focuses on self-improvement rather than judgment by external standards (as in extrinsic motivation). Another factor that may distinguish the two goals is pressure to perform well. Under learning goals individuals are said to view mistakes as part of the learning process, whereas under performance goals, mistakes are "anxiety eliciting" (Ames & Archer, 1988, p. 261). Similarly, intrinsic motivation theorists (e.g., Deci & Ryan, 1987) have argued that extrinsic motivation conditions lead people to feel pressured to perform and to lack a feeling of autonomy in engaging in a task (similar to DeCharms's, 1968, conception of ego involvement as a state of being a pawn). Thus, it may be that increasing pressure by, for example, presenting a task as a measure of an valued ability, will exacerbate the debilitating effects of performance goals and lead to a larger advantage for learning goals.

Regarding the two above dimensions differentiating learning and performance goals, it was predicted that larger learning goal effects will result when performance goals are highly externally-referenced and learning goals self-referenced or when performance goals are induced in a highly pressuring manner and learning goals in an unpressured manner. If these dimensions do underlie the learning goal advantage, learning and performance goal inductions that are quite distinct should result in a larger difference in motivational effect and hence a larger learning goal advantage.

As the aforementioned theorists have argued, it may be that concern with being evaluated against the performances of peers may lead to a greater performance goal focus and thus to debilitated performance. Evidence for evaluation against one's peers as a moderator of the learning goal advantage is provided by another research area, social facilitation (e.g., Bond & Titus, 1983). Geen (1989), for example, reviewed social facilitation research and theories and stated that there is ample evidence that the presence of coparticipants in an experiment may debilitate performance on difficult tasks when comparative evaluation is salient. Under performance goal inductions, the presence of coparticipants is likely to be perceived as a salient source of normative comparisons, which could increase the debilitation of performance expected in such a condition. Given the focus on self-improvement expected under learning goals, it is possible that such individuals might not be affected by the potential for comparison to peers. Rather, they might see the presence of their peers during testing as taking the spotlight of individual scrutiny off themselves. Such a result would be consistent with the findings of social loafing research conducted by Jackson and Williams (1985), in which participants who were not specifically told about individual evaluation perceived coparticipants as serving to prevent the experimenter from being able to evaluate them as individuals. Given the above reasoning, it was predicted that the presence of coparticipants would lead to a larger advantage for learning goals than when participants are tested alone, as individuals in performance goal conditions would be more debilitated and learning goal condition participants would be relatively unaffected by the presence of others. To test this hypothesis, studies in which participants are tested alone are contrasted with those in which participants are tested in the presence of coparticipants.[1]

Method

Literature Search Procedure

The studies included in this meta-analysis were found primarily through a search of the CD-ROM database version of PsycLIT (American Psychological Association, 1974–1996). Keywords used in this search were: *achievement goals, performance goals, learning goals, task-involved, ego-involved, learning oriented, performance oriented, mastery focused, ability focused,* and *intrinsic motivation and performance.* Reference sections of all studies included in the meta-analysis were searched to identify further relevant studies, as were the reference sections of reviews of motivational research (e.g., Ames, 1992; Deci & Ryan, 1987; Ryan & Powelson, 1991). Because several of the included studies were from the *Journal of Educational Psychology,* that journal was manually searched from 1970 through the present.

Research Inclusion Criteria and Determination of Individual Effect Sizes

A study was included in this analysis if it met the following criteria: (a) It compared the performance of a learning goal group (suggestion that learning, self-improvement were important and possible) with that of a performance goal group (suggestion that demonstrating high ability was important and possible), (b) achievement goals (learning and performance) were manipulated rather than simply measured and correlated with performance, (c) participants were randomly assigned to conditions, (d) the study contained enough information to calculate an effect size (e.g., provided group means and standard deviations, F, t, χ^2 or numbers of participants improving, for the specific groups to be compared), and (e) the study manipulated individual goals only, not group goals. Application of these criteria led to the exclusion of studies that experimentally controlled performance to ensure equivalent task outcomes in different conditions (e.g., Harackiewicz & Elliott, 1993). Because the focus of this meta-analysis is on how external factors influence motivation and performance, studies which merely measured the typical achievement goal orientation of individuals (individual difference variable) and correlated it with their performance (e.g., Ames & Archer, 1988) were excluded. Also excluded were social loafing (e.g., Harkins & Szymanski, 1988; Williams, Harkins, & Latane, 1981) and social facilitation research (e.g., Geen, 1983; Markus, 1978), as research in these areas does not contrast manipulations that are directed toward learning, are self-referenced, and unpressured (learning goals) to ones that are directed toward performing well, are externally-referenced, and pressured (performance goals). Rather, they contrast situations in which some external factor, such as evaluation pressure, is either present or absent. Also excluded were goal-setting studies (e.g., Locke & Latham, 1990; Locke, Shaw, Saari, & Latham, 1981) as such research compares the effect of different levels of goals (usually numerical criteria), not different goal orientations toward the task. Finally, the use of the criteria set out previously also led to the exclusion of research that contrasted competitive with cooperative conditions (e.g., D. W. Johnson, R. T. Johnson, & Skon, 1979). Cooperative goals include goals related to the performance of a group as a whole and may involve social interaction motives related to the task. Therefore, cooperative goals are not strictly individual achievement goals and so are not directly comparable to the other research included in this analysis.

The literature search identified 24 studies relevant to the analysis. One study (Hennessey, Amabile, & Martinage, 1989) contained two separate experiments with relevant comparisons. This study therefore contributed two independent effect sizes to the analysis. Studies that assigned participants to learning or performance goals within subgroups based on individual difference variables (e.g., Butler, 1987, high vs. low achievers) also contributed multiple independent effect sizes, one for each subgroup. Although participants in these studies were tested within the same experimental framework, treating each subgroup as a separate experimental comparison is warranted because each effect size was obtained from subgroups comprised of different individuals. Several studies crossed a motivational state manipulation with other manipulations designed to affect task performance (e.g., Elliott & Dweck, 1988, high- vs. low-ability feedback). As was the case for individual difference variables, separate effect sizes were again calculated for each group formed by the assignment of participants to levels of the other independent variable (e.g., low-ability feedback: learning goal vs. performance goal comparison; high-ability feedback: learning goal vs. performance goal comparison).

For studies that used multiple measures of performance (e.g., multiple trials), effect sizes were calculated (when possible) for each measure and then averaged.

[1] Dweck (1986) provided evidence for gender as a moderator of the effects of achievement goals, arguing that female participants may be more sensitive to performance concerns than male participants. Unfortunately, most of the studies included in this meta-analysis did not provide performance data broken down by gender, thus preventing an analysis of the influence of gender on the learning goal advantage. In future research it would be appropriate to specifically test potential gender differences in accordance with Dweck's predictions.

However, a few studies (Benware & Deci, 1984; Butler & Nisan, 1986; Conti, Amabile, & Pollak, 1995; Grolnick & Ryan, 1987) assessed performance on different tasks that included (at least one of each) both simple and complex tasks. Because one of the hypotheses of this article is that the learning goal advantage will be found for complex but not simple tasks, studies including both types of measures contributed separate effect sizes for their simple and complex tasks.[2]

Use of the preceding methodology produced 43 effect sizes to be used in analyses of the effect of achievement goals on performance.

Effect Size

In this meta-analysis Cohen's *d* was used (after Cohen, 1988) as a measure of effect size. This involved subtracting the mean score of the performance goal group from the mean score of the learning goal group and dividing that difference by the pooled standard deviation of the two groups. Thus, a performance advantage for the learning goal group resulted in a positive *d*. For studies which included control conditions (e.g., Graham & Golan, 1991) the effect size was calculated using the results from the learning and performance goal conditions only. When means were not given, but significance test results were, the *F*, *t*, or χ^2 was converted to *d* (after Rosenthal & Rosnow, 1991).[3]

Tests of Hypotheses

The first test of achievement goal theory involved documenting the advantage for learning goals over performance goals on tasks as predicted by motivation researchers (e.g., Butler & Nisan, 1986; Elliott & Dweck, 1988; Grolnick & Ryan, 1987; Nicholls, 1984). To do this, effect sizes were cumulated across studies and a weighted average (after Rosenthal & Rosnow, 1991) was calculated.

To test the effect of task complexity two analyses were conducted. First, six judges rated task complexity on an 11-point scale ranging from 1 (*very simple*) to 11 (*very complex*), and the effective reliability of the composite rating formed from the individual judges' ratings was $r = .77$.[4] These ratings were then used to calculate weights to perform a linear contrast testing the hypothesis that for simple tasks there would be no learning goal advantage, whereas for more complex tasks a learning goal advantage would occur. The second analysis involved a categorization of tasks into two groups: a simple group, consisting of tasks which had been described by the original researchers as being simple or rote, and a complex task group, consisting of the corresponding tasks designated as complex in the same studies in which the simple tasks had been used. For the simple group, consisting of five effect sizes from four studies (Benware & Deci, 1984; Butler & Nisan, 1986; Conti et al., 1995; Grolnick & Ryan, 1987), a mean effect size was calculated and contrasted against the mean effect size calculated for the complex tasks that had been used in the same studies (five effect sizes).

To test the effect of age as a possible moderator of the learning goal advantage, the participants' school grade level was coded for each study. It was not possible to code age as exact ages were normally not provided, whereas the grade level was. Studies were categorized into two groups, grade school (Grades 3–6) or college (Grades 13–16), and the mean effect sizes were compared.

To determine whether learning and performance goal manipulations within a particular experiment that were very distinct from each other resulted in a larger learning goal effect, dimensions underlying the differences between the achievement goal inductions were identified (as discussed in the introduction). Inferential ratings of the perceived effect of the goal manipulations on research participants were made (after Hall, Rosenthal, Tickle-Degnen, & Mosteller, 1994; Miller, Lee, & Carlson, 1991). The dimensions were rated on two

[2] The four studies (five effect sizes) that included simple tasks (Benware & Deci, 1984; Butler & Nisan, 1986; Conti et al., 1995; Grolnick & Ryan, 1987) also contributed effect sizes for complex tasks to the main analyses. Although comparison of these simple measures to the effect sizes for complex tasks violates the assumption of independence (same individuals for simple and complex tasks), it was felt the analysis could at least provide evidence consistent or not consistent with the hypothesis. Thus, conclusions drawn from the comparison of simple versus complex tasks should be viewed as tentative.

[3] One study (R. Koestner, Zuckerman, & J. Koestner, 1989) which contributed two effect sizes to the meta-analysis reported only that the difference between learning and performance goal conditions was nonsignificant and did not include information necessary to calculate *d*. For all analyses the effect sizes for this study were set to zero. Because exclusion of these two effect sizes did not materially affect the results, only analyses including these two effect sizes are reported.

[4] The complexity of the task was originally rated in the same manner as the manipulation ratings (i.e., the author rated the tasks, then a colleague rated a subsample). However, this procedure did not provide adequate evidence of reliability for the ratings ($r < .30$). To provide a clear, empirically based definition of task complexity that would result in a reliable index, a modified version of the definition given by Wood (1986) was provided to six judges. This definition included consideration of the number of acts to be performed during the task (component complexity), the size and structure of relations between task acts (coordinative complexity), and changes in requisite task acts and the relations between them (dynamic complexity). Each of six judges rated each task and then the average of the six judges ratings was used as the composite rating for the complexity of each separate task.

scales assessing the extent to which the experimental instructions (a) suggested that success is defined by self-referenced (learning) versus externally-referenced (performance) standards or (b) pressured the participants to perform well (high pressure consistent with a performance goal). Ratings on a 7-point scale were made by the author for each study for each type of goal (learning and performance). A subsample of 10 studies selected randomly was independently rated by a colleague of the author, and the reliabilities (Pearson *r*) obtained were .87 and .84 for the self-referenced versus externally-referenced and pressure ratings, respectively. For each question a difference score between the learning and performance goal within that study was calculated and then related to the size of the learning goal advantage in that study. For these ratings analyses, the ratings were used to calculate linear trend contrasts, testing the hypothesis that as the difference between learning and performance goal ratings increased, the size of the learning goal advantage on the task score measure would also increase.

To test the effect of the presence of others as a potential moderator of the learning goal advantage, whether individuals were tested alone or with other participants was coded. Mean effect sizes were calculated for the alone and others present groups and a contrast performed on the difference between the two means.

Several studies measured individual difference variables to assign participants to different groups (e.g., Butler, 1987; high vs. low achievers) or crossed achievement goal manipulations with other manipulations (e.g., Elliott & Dweck, 1988; high- vs. low-ability feedback). However, due to the small number of studies, no individual difference or manipulation was common to more than three studies. Therefore, quantitative analyses of these variables were not possible.

Results

An alpha level of .05 was used for all statistical tests. All studies (with their associated effect sizes) are listed in Table 1.

The main prediction of the three motivation theories discussed in the introduction is that learning goals will lead to better task outcomes than will performance goals. As noted previously, a positive d score would indicate an advantage for a learning over a performance goal condition within a study. Effect sizes were averaged, and the mean for all studies was $d = .53$, which was significantly greater than zero, combined $z = 7.45$, $p < .0001$, indicating that the advantage for learning goal inductions demonstrated in the literature was almost certainly not due to chance. The file drawer N (after Rosenthal & Rosnow, 1991) of 839 indicates that more than 800 studies finding no differences between learning and performance goal conditions that were not included in this meta-analysis would have to exist for the overall effect size to be no greater than zero. Thus, the danger of nonpublished or unretrieved published studies negating the overall conclusions of the current analysis is quite small. These results indicate a moderate effect size according to Cohen (1988) and provide strong support for the basic prediction of a learning goal advantage made by motivation theorists (e.g., Dweck, 1986; Grolnick & Ryan, 1987; Nicholls, 1984).

A heterogeneity test of the 43 effect sizes was conducted (after Snedecor & Cochran, 1989) to determine if there was significant variation in the magnitude of the effect sizes. This test revealed that there was significant variation in the effect sizes, $\chi^2(42, N = 43) = 235.58$, $p < .0001$, indicating that there was good reason to suspect the presence of moderators of the learning goal advantage.

To test the prediction that task complexity would moderate the learning goal advantage, a composite rating of complexity for each task was related to the effect size for each study. This contrast was significant and positive, $z = 2.22$, $p < .05$, indicating that as rated task complexity increased, the learning goal advantage grew larger.

A second complexity analysis was conducted by comparing the tasks designated as simple by experimenters to those designated as complex in the four studies that included both simple and complex tasks. For tasks identified as simple or rote by the experimenters, the mean effect size was $d = -.03$, combined $z = -.88$, $p > .20$. For the corresponding complex tasks the mean effect size was $d = 1.18$, combined $z = 6.88$, $p < .0001$. Further, a contrast between these two groups was positive and significant, $z = 4.61$, $p < .0001$. The categorical analyses provide additional support for task complexity as a moderator of the learning goal advantage. The results of both the judges' ratings and experimenter categorization analyses suggest that, as predicted, and as suggested by prior research (e.g., Butler, 1988; Grolnick & Ryan, 1987), the learning goal advantage is larger when tasks are complex.

Because the theory-based prediction that no learning goal advantage would occur for simple tasks was substantiated, the remaining moderator analyses were conducted in two ways: with all effect sizes included (43 effect sizes included) and with effect sizes for tasks designated as simple by the researchers excluded (38 effect sizes included). In the analyses to follow, results for all effect sizes are presented first and results for the complex task set are presented in parentheses unless they are materially different than the overall result.

It was hypothesized that younger children would be relatively unconcerned with performance pressures and so would demonstrate a smaller learning goal effect than older children and adults. As can be seen in Table

Table 1. *Listing of Included Studies With Effect Sizes (d) and Experimental Tasks*

Authors	Effect Size (*d*)	Experimental Task
Amabile (1979)	2.66	Collage making
Benware & Deci (1984)	1.77	Psychology article questions (conceptual)
	0.45	Psychology article questions (rote)[a]
Butler (1987)	1.81	Use generation
	1.79	Use generation
Butler (1988)	0.63	Use generation
	0.61	Use generation
Butler & Nisan (1986)	1.52	Use generation
	0.13	Word jumble[a]
Conti, Amabile, & Pollak (1995)	0.72	Creative writing
	–0.17	Creative writing
	–0.15	Rote recall questions[a]
	–1.30	Rote recall questions[a]
Covington & Omelich (1984)	1.50	Psychology exam
	1.10	Psychology exam
Dyck & Breen (1978)	0.56	Anagrams
	0.64	Anagrams
	–0.11	Anagrams
Elliott & Dweck (1988)	0.32	Pattern recognition
	–0.11	Pattern recognition
Flink, Boggiano, & Barrett (1990)	1.55	Anagrams, sequencing, and spatial relations
Giannini, Weinberg, & Jackson (1988)	–0.46	Basketball free throw
Graham & Golan (1991)	0.38	Word memorization
	0.25	Word memorization
	0.50	Word memorization
Grolnick & Ryan (1987)	0.49	Reading comprehension (conceptual)
	–0.29	Reading comprehension (rote)[a]
Hennessey, Amabile, & Martinage (1989)	–0.38	Storytelling
	0.62	Storytelling
D. S. Johnson, Perlow, & Pieper (1993)	0.57	Space shuttle simulator
R. Koestner, Zuckerman, & J. Koestner (1987)	0.24	Hidden figure puzzle
R. Koestner, Zuckerman, & J. Koestner (1989)	0.00	Hidden figure puzzle
	0.00	Hidden figure puzzle
MacGregor (1988)	–0.93	Reading comprehension
MacGregor & Thomas (1988)	–0.97	Reading comprehension
	–1.08	Reading comprehension
Schunk (1983)	–1.60	Subtraction problems
Schunk & Rice (1989)	0.28	Reading comprehension
Schunk & Rice (1991)	0.28	Reading comprehension
Stipek & Kowalski (1989)	0.64	Pattern recognition
	0.00	Pattern recognition
Trzebinski (1974)	0.43	Anagrams, plot titles, word rearrangement, consequences
	0.43	Anagrams, plot titles, word rearrangement, consequences

[a]Indicates task labeled *simple* by the researcher using it. Used for categorization for analysis of the difference between simple and complex tasks.

2, both grade school students and college students (young and old individuals, respectively) demonstrated a learning goal advantage significantly greater than zero. However, as predicted, the learning goal effect was significantly smaller for the younger students than for the older ones.

Because the ages of children in the grade school studies varied relatively continuously and there was a large age gap between grade school students and college students, it was decided to perform a linear trend contrast on the 26 grade school studies separately. The contrast was significant and positive, indicating that the higher the grade level, the greater was the advantage of learning goal over performance goal conditions, $z = 4.27$, $p < .0001$ (complex task set analysis: $z = 4.44$, $p < .0001$, $n = 24$). The results of the age analyses are consistent with the arguments of Nicholls (1984) and Ruble et al. (1980) that sensitivity to performance concerns does increase as children grow older.

Characteristics of the goal manipulations were rated as explained in the Method section on the two dimensions hypothesized to underlie the learning goal advantage (self-referenced vs. externally-referenced standards, pressure to perform well). To determine whether learning and performance conditions did differ as predicted along these dimensions, matched *t* tests were

Table 2. Comparisons of Effect Sizes: Age Differences and Presence of Others

Group	*n*	Mean *d*	Stouffer Z	*p*	File Drawer *N*
College	17	.68	6.16	< .0001	221
(Complex Task Set)	14	(.79)	(7.24)	(< .0001)	(257)
Grade School	26	.43	4.60	< .0001	177
(Complex Task Set)	24	(.53)	(4.85)	(< .0001)	(184)
Contrast z (College vs. Grade School) = 1.96, $p = .05$ (Complex Tasks Only: $z = 2.89$, $p < .005$)					
Alone	27	.28	3.92	< .0001	126
(Complex Task Set)	23	(.37)	(4.84)	(< .0001)	(176)
Others	13	.87	9.68	< .0001	436
(Complex Task Set)	12	(1.03)	(9.82)	(< .0001)	(415)
Contrast Z (Alone vs. Others)[a] = 3.15, $p < .01$ (Complex Tasks Only: $Z = 2.44$, $p < .05$)					

Note: Positive d signifies performance advantage for learning goal conditions relative to performance goal conditions.
[a]$n = 40$ for this comparison ($n = 35$ for complex set analysis) as 3 of the 43 effect sizes came from studies in which participants were alone for part of the task and in the presence of others for part of the task.

performed, comparing, for each dimension, the differences between the learning and performance manipulation ratings. The t tests indicated that learning goal manipulations, as compared to performance goal manipulations, were more self-referenced, $t(43) = 14.28$, $p < .0001$, and pressured participants to a lesser extent, $t(43) = 15.82$, $p < .0001$. Thus, inductions of learning and performance goals do appear to vary in the way they were predicted to differ.

For each dimension, the learning goal rating for each study was subtracted from the performance goal rating for the same study. The resulting difference was taken to be an indication of how distinct the two manipulations were. It was predicted that the larger the difference between the two goal manipulations in a study the larger would be the effect size. Positive contrast z scores indicated that larger differences on the rated dimensions were associated with larger effect sizes.

The contrast for the ratings of the extent to which the participants were focused on externally- versus self-referenced standards of success (mean difference = 3.02) was not significant, $z = -.13$, $p > .20$ (complex task set analysis: $z = .87$, $p > .20$, $n = 38$). The contrast for the difference between the two goal manipulations for the rating of "pressure" (mean difference = 3.14) was significant, $z = -2.46$, $p < .05$, albeit the complex task set analysis did not attain conventional significance levels, $z = -1.67$, $p < .10$, $n = 38$. However, these contrasts resulted in a negative z, suggesting that smaller differences between the two goals on pressure resulted in larger effect sizes.

To follow up on this finding, ratings for the learning goals by themselves were related to effect size. This contrast indicated that learning goals with higher levels of pressure were associated with larger learning goal advantages, $z = 4.90$, $p < .0001$ (complex task set analysis: $z = 4.48$, $p < .0001$, $n = 38$). An analysis of performance goal ratings by themselves revealed that, as predicted, high levels of pressure were associated with larger learning goal effects, $z = 2.17$, $p < .05$ (complex task set analysis: $z = 2.66$, $p < .001$, $n = 38$). However, these results must be viewed in light of the fact that the range of pressure ratings for learning goals (2–5 on a 7-point scale) was lower than the range of pressure ratings for performance goals (4–7 on a 7-point scale). Thus, it appeared that, when learning goals were moderately pressuring (at the high end of pressure for learning goals) the learning goal effect was increased. High levels of pressure (near top of ratings scale) in performance goals were related to increased learning goal effects, suggesting that more pressure under performance goals may result in greater debilitation.

An analysis was conducted testing the prediction that the presence of other participants would moderate the learning goal advantage. As can be seen in Table 2, both participants tested alone and those tested in the presence of other participants did demonstrate a significant learning goal advantage. However, as predicted, those tested alone demonstrated a significantly smaller advantage for learning goals than did participants tested in the presence of others. This is consistent with the findings of social facilitation research that the presence of others may increase pressure to perform well when individuals are focused on the potential for evaluation (as in a performance goal situation) and leads to further debilitation of performance.[5]

[5]In response to a reviewer's concerns that age and presence of others might be confounded in that children might more often be tested alone, the number of studies using college versus grade school students was examined for both the studies categorized as "alone" and those as "others." This revealed no apparent difference in the number of studies using children in the alone as opposed to the others present condition. In fact, the percentage of child studies in the others condition was slightly higher (62%) than in the alone condition (56%). Thus it appears that the findings for presence of others moderator were not due to age.

Discussion

Findings and Implications

The main prediction that the induction of learning goals would lead to a performance advantage over the induction of performance goals was strongly supported by the reliable positive mean effect size (d = .53) calculated from all studies included in the meta-analysis. According to Cohen (1988) this finding represents a moderate effect size. The meta-analysis of the basic learning goal advantage provides strong support across a wide range of experimental tasks (e.g., anagrams, making collages, computer simulations, reading comprehension) for the claims of motivation theorists (e.g., Butler, 1987; Dweck, 1986; Grolnick & Ryan, 1987; Nicholls, 1984) that a focus on the opportunity for learning and the development of competence leads to better task performance than does a focus on displaying high levels of ability.

As suggested by one of the reviewers, it is important to note that limiting this meta-analysis to published experimental studies constitutes a highly selective test of the learning goal advantage. However, the large file drawer N obtained suggests that it is unlikely that the overall finding is threatened by unpublished studies that did not find a learning goal advantage. Further, the limitation of including only experimental studies seems justified by the fact that studies correlating personality variables (e.g., typical achievement goal orientation; Ames & Archer, 1988) with performance introduces possible individual difference confounds (e.g., need for achievement) into the determination of the specific relation between achievement goals and performance. Therefore, these limitations seem justified given the subtlety of the effects of achievement goals on performance.

Strong support was also obtained for the hypothesis that the learning goal advantage would be larger for complex than simple tasks. The analyses of complexity showed that as rated task complexity increased, the size of the learning goal advantage increased and, for tasks classified by the researchers as simple, learning and performance goal inductions led to equivalent performance. These results are consistent with the findings of intrinsic motivation research (e.g., Grolnick & Ryan, 1987) and task/ego involvement research (e.g., Butler, 1988) that showed an advantage for learning goals only on complex tasks. The complexity findings are also consistent with Deci and Ryan's (1985) arguments that intrinsic motivation leads to more creative flexible thinking. Such a state should be especially helpful for tasks that involve some creativity (e.g., writing stories; Conti et al., 1995) or the ability to manipulate information in novel ways (e.g., anagrams; Dyck & Breen, 1978). Nonetheless, social facilitation research (e.g., Geen, 1989; Zajonc, 1965) suggests that for simple tasks, evaluation pressure may actually lead better performance than when such pressure is absent. The lack of an advantage in performance goals/extrinsic motivation/ego-involved conditions on the tasks designated as simple in this meta-analysis may be due to the fact that the tasks used in the collected research (e.g., reading comprehension questions; Benware & Deci, 1984) are not as uncomplicated as the simple tasks (e.g., Markus, 1978 [removing shoes]; Schmitt, Gilovich, Goore, & Joseph, 1986 [typing one's name]) used in social facilitation research. To test the effect of complexity on achievement goals, future research can include tasks of a wide range of complexity within the same experimental design.

Support was also obtained for the prediction that age would moderate the learning goal advantage. Age analyses revealed that older children and young adults showed a greater advantage for learning goal inductions over performance goal inductions. These findings are consistent with the notion that performance concerns develop with socialization over time. As argued by Nicholls (1984) and Ruble et al. (1980), children may initially be relatively unconcerned with outperforming others. As Nicholls's and Ruble's research indicates, children seem to learn to become concerned with measuring themselves against others as they grow older, suggesting older children and adults will be more debilitated than younger children by performance concerns when faced with a task that at which they are uncertain they will succeed. Thus the finding of the age analyses that the learning goal advantage increases with age is consistent with Nicholls's and Ruble's theorizing and suggests a possible boundary condition for the advantage for intrinsic motivation/task-involvement/learning goals.

The prediction that the extent to which the induced goals used standards of success that were self-referenced versus externally-referenced would affect the size of the learning goal advantage was not supported. Analyses of inferential ratings of characteristics of the manipulations of achievement goals revealed that for the dimension of the extent to which self- versus externally-referenced standards of success were suggested, the difference between learning and performance goal inductions was not associated with the magnitude of the learning goal advantage. Although this might indicate that this dimension is not related to the learning goal advantage, it may be that judgments made by people not actually exposed to the inductions do not match the effects on participants in research. It is also possible that only a minimum amount of difference on these dimensions is needed to produce the effect and further increases in the disparity between learning and performance goal inductions have little effect.

The hypothesis that high pressure performance goal inductions and low pressure learning goal inductions would lead to a larger learning goal advantage was partially supported. Analyses for the dimension of pressure to perform well suggested that in learning goal conditions, moderate levels of pressure were more effective than low levels of pressure in facilitating performance, whereas high pressure in performance goal conditions may have resulted in the largest debilitation of performance. For performance goal inductions, the findings supported the prediction that high pressure may lead to greater performance debilitation. Contrary to what had been predicted, learning goal inductions that were judged to be low in pressure did not improve learning goal condition performance (relative to performance goal conditions); in fact, moderate levels of pressure seemed to increase the learning goal advantage. It may be that under learning goal conditions, individuals may be relatively uninterested in the same outcomes as the experimenter, and, when not pressured to meet specified standards of performance, such individuals direct their efforts toward self-improvement, not toward scoring well. Thus, when not given a little extrinsic motivation to attain a high level of performance, individuals may not score as well as when they are prodded a little bit to do so. Given the relentless socialization our culture uses to inculcate performance orientations in individuals, it is perhaps not surprising that a little "stick" must be added to the "carrot" of the opportunity to learn.

Finally, as predicted, the presence of other participants performing the same task led to a larger learning goal advantage than when participants were tested individually. This finding suggests that the presence of others might increase concern with evaluation of ability in performance goal situations. Such a process would be consistent with the findings of social facilitation research (e.g., Geen, 1989) in that the presence of others appears to increase the concern of individuals who are focused on the possibility of evaluation (as in a performance goal condition). Further, the fact that the presence of others did not appear to debilitate performance for individuals in the learning goal conditions (because the learning goal advantage actually increased in the presence of others) suggests that a focus on self-improvement may buffer the harmful effects of concern with evaluation. Future research could examine this possibility that mastery goals do buffer performance concerns and further delineate the effects of the presence of others as a contextual moderator of the learning goal advantage.

Future Research and Applications

As suggested previously, judges' ratings of dimensions of the goal inductions may be a relatively weak way to test the explanatory power of the dimensions. Future research could provide a better test of the effects of pressure and the suggestion of a standard of comparison (self vs. external source of comparison) by explicitly manipulating them within experiments.

Another important direction for future research is an investigation of the psychological states that mediate the learning goal effect. Dweck and Leggett (1988) argued that performance goal situations (relative to learning goal situations) might lead to a loss of belief in efficacy of effort, defensive withdrawal of effort, divided attention, affect that interferes with task efforts, and lack of intrinsic rewards. Although these factors bear a plausible relation to the impaired performance in performance goal conditions and improved performance in learning goal conditions, these mediating factors have not been directly tested. Some attributional self-report data (e.g., Butler, 1987; Butler & Nisan, 1986; Elliott & Dweck, 1988) and the findings of intrinsic motivation research (e.g., Benware & Deci, 1984; Grolnick & Ryan, 1987) are consistent with the notion that these factors may mediate performance effects. However, a more direct test of some of the factors (e.g., comparing the amount of attention given to a task in the two conditions) would help test the proposed mediators.

Such mediational research might also illuminate the relation between achievement goal research and other areas of motivational research. Social facilitation researchers (e.g., Baron, Moore, & Sanders, 1978; Hunt & Hillery, 1973) have found evidence that the presence of others may be arousing or distracting, resulting in impaired performance on difficult tasks. Such arousal or distraction may result from evaluation or self-presentation concerns, psychological states consistent with a performance goal. Social loafing research (e.g., Jackson & Williams, 1985; Szymanski & Harkins, 1992) has demonstrated that external evaluation impairs performance on difficult tasks. Such evaluation concern may have its effect on performance through negative affect or cognitive interference, factors Dweck and Leggett (1988) hypothesized could account for the impairment of performance goals. Thus, it seems likely that research investigating mediators of the learning goal effect may lead to the knitting together of several areas of motivational research.

One important application of the findings of achievement goal research is in educational settings. Our current educational system is highly focused on normative comparisons and performance grading, concerns that emphasize performance goals above all else. Indeed, with calls for standardized skills testing and a highly educated work force, it seems that performance pressure is increasing in education. The results of this meta-analysis suggest that such pressure may make it harder to attain the goal of improving the American educational system. Further, given the greater interest and enjoyment that a mastery orientation has been found to provide (e.g., Butler, 1987; Deci & Ryan, 1985), an emphasis on extrinsic, performance goals might also cheat students out of highly pleasurable learning experiences. Another important application of motivational state research is in the workplace. Concern with the need to educate workers continuously to keep up with technological advancements and the need for retraining in response to job displacement mandates that people learn efficiently and continuously over the life span. A mastery orientation in the workplace, as in the classroom, might enable individuals to learn well, persist in learning, and to find the experience enjoyable. Thus, a greater understanding of the benefits of mastery as an achievement goal may help increase individuals' knowledge, performance, and satisfaction in a variety of life tasks.

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