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Achievement Goals and Intrinsic Motivation: A Meta-Analytic Review

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This article presents a meta-analysis of the experimental literature that has examined the effect of performance and mastery achievement goals on intrinsic motivation. Summary analyses provided support for the hypothesis that the pursuit of performance goals has an undermining effect on intrinsic motivation relative to the pursuit of mastery goals. Moderator analyses were conducted in an attempt to explain significant variation in the magnitude and direction of this effect across studies. Results indicated that the undermining effect of performance goals relative to mastery goals was contingent on whether participants received confirming or nonconfirming competence feedback, and on whether the experimental procedures induced a performance-approach or performance-avoidance orientation. These findings provide conceptual clarity to the literature on achievement goals and intrinsic motivation and suggest numerous avenues for subsequent empirical work.

Contemporary research on achievement motivation is based largely on an analysis of individuals' *achievement goals,* which are defined as the purpose of or reason for competence-relevant activity (Ames, 1992; Maehr, 1989). A number of researchers have contrasted different types of achievement goals and examined the effects of these goals on a variety of cognitive, affective, and behavioral outcomes (for reviews, see Ames, 1992; Dweck, 1986; Nicholls, 1989; Urdan, 1997). One outcome that has attracted considerable research attention is *intrinsic motivation,* or interest in and enjoyment of an activity for its own sake (Deci & Ryan, 1985; Lepper, 1981). Intrinsic motivation has been recognized by many theorists as a central aspect of adaptive self-regulation in the achievement domain (Butler, 1987; Deci & Ryan, 1985; Harackiewicz, 1989; Koestner, Zuckerman, & Koestner, 1987; Lepper, 1981; Sansone, 1986). The impact of different goal states on individuals' intrinsic enjoyment of achievement-related activities is an issue of considerable theoretical importance in that it forges a conceptual link between the achievement and intrinsic motivation literatures (Harackiewicz & Elliot, 1993), and it is also an issue of great applied importance in that it has direct implications for educational, occupational, and sport settings (Heyman & Dweck, 1992). This article presents a meta-analysis of the experimental research that has examined the effect of achievement goals on intrinsic motivation.

Most formulations of the achievement goal construct have delineated two distinct forms of achievement goals. Dweck (1986) contrasted learning goals with performance goals; Ames (1984) and Butler (1992) differentiated mastery goals from ability goals; and Nicholls (1989), Ryan (1982), and others (Koestner et al., 1987) compared task involvement and ego involvement (for alternative proposals, see Maehr, 1984; Meece, Blumenfeld, & Hoyle, 1988; Wolters, Yu, & Pintrich, 1996). Despite differences in terminology and conceptual frameworks espoused by these theorists, Ames and Archer (1987) argued that these formulations share enough similarity to justify convergence in a mastery goal (learning goals, mastery goals, and task involvement) versus performance goal (performance goals, ability goals, and ego involvement) distinction. *Mastery goals* focus on the development of competence and task mastery, whereas *performance goals* focus on the demonstration of competence relative to others.

Most achievement goal and intrinsic motivation theorists contend that mastery and performance goals

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produce distinct processes that have divergent consequences for intrinsic motivation. Mastery goals are posited to promote challenge appraisals, encourage task absorption, and support self-determination and feelings of autonomy, all factors presumed to be facilitative of intrinsic interest and enjoyment (Butler, 1987; Deci & Ryan, 1985; Dweck, 1986). Performance goals, on the other hand, are posited to produce evaluative pressures and elicit anxiety, processes considered antithetical to intrinsic motivation (Harackiewicz, Manderlink, & Sansone, 1984; Ryan & Stiller, 1991). Thus, most theorists have espoused a main effect hypothesis whereby individuals pursuing performance goals are expected to demonstrate lower levels of intrinsic motivation than their mastery-oriented counterparts (Deci & Ryan, 1990; Dweck, 1986; Nicholls, 1989). Empirical investigations of the relation between achievement goals and intrinsic motivation, however, have yielded mixed support for this main effect hypothesis. Although a number of experiments have documented an undermining effect of performance goals on intrinsic motivation (Butler, 1987, 1988; Harackiewicz, Abrahams, & Wageman, 1987; Ryan, 1982; Ryan, Koestner, & Deci, 1991), other investigations have failed to provide supporting evidence (Butler, 1992; Harackiewicz & Elliot, 1993; Koestner, Zuckerman, & Koestner, 1989; Sansone, 1986). Accordingly, there exists a degree of uncertainty regarding the relation between performance and mastery achievement goals and intrinsic motivation.

One objective of this article is to reduce this uncertainty by examining the evidence for the main effect hypothesis in the experimental literature. We employ meta-analytic techniques to address the question of whether, across studies, the pursuit of performance goals has an undermining effect on intrinsic motivation relative to the pursuit of mastery goals. A second objective of this article is to identify factors that can account for the inconsistency of the performance versus mastery goal effect in the literature. Several factors are tested meta-analytically as potential explanations for the variability of study outcomes, including the strength of the manipulation used to establish performance goals, the type of performance feedback provided to participants, and the outcome focus induced by the experimental procedures. Each of these alternative explanatory factors is explored in detail.

Ego-Involvement Versus Normative Performance Goals

Performance goals have been alternatively conceptualized in terms of either (a) self-esteem contingency or (b) a focus on normative evaluation alone. Investigators who conceptualize performance goals in terms of self-esteem contingencies, or *ego involvement,* generally employ a somewhat stronger form of performance-goal manipulation than those emphasizing the normative aspect of performance goals alone. A number of researchers have acknowledged this conceptual and methodological distinction and suggested that this difference may underlie the inconsistency of the performance versus mastery goal effect in the literature (Harackiewicz & Elliot, 1993; Ryan et al., 1991; Sansone, Sachau, & Weir, 1989).

The concept of ego involvement refers to a condition in which one's self-esteem is invested in or contingent on attaining a specified outcome or reaching a certain standard (Deci & Ryan, 1985; Ryan, 1982). Researchers focusing on the effect of ego involvement on intrinsic motivation have manipulated performance goals in a manner that explicitly links performance on the experimental activity to a central, self-relevant attribute. In the first study to examine the effects of ego involvement on intrinsic motivation, Ryan (1982) presented a puzzle-solving task as a measure of creative intelligence and informed participants that the activity was often used as a component of IQ tests. Subsequent ego-involvement studies have followed suit and employed performance-goal manipulations that introduced the target activity as a test of intelligence or some other valued attribute (Butler, 1992; Koestner et al., 1987). The assumption underlying this procedure is that, by linking performance to an esteem-relevant attribute, participants will be pressured to perform well to preserve their sense of self-worth. Such evaluative pressures are argued to elicit performance anxiety and undermine feelings of autonomy and self-determination, thereby undermining individuals' intrinsic motivation for the activity at hand (Deci & Ryan, 1985; Ryan, 1982).

Other researchers have conceptualized performance goals solely in terms of normative evaluation and social comparison. These investigators have generally instantiated performance goals by making salient a normative referent for evaluation without linking performance to a self-relevant attribute. For example, Harackiewicz and Elliot (1993) manipulated performance goals by informing participants that their performance on the experimental task (a pinball game) would be compared to the performance of other students who had previously participated in the study. At no time, however, were performance outcomes presented as reflective of any specific skills, abilities, or personal attributes. Thus, the manipulation emphasized normative evaluation and social comparison but did not explicitly implicate esteem-relevant personality dimensions.

By introducing self-esteem contingencies, studies designed to induce ego involvement may have a greater potential to elicit evaluative pressure and anxiety than studies that simply emphasize normative evaluation and, therefore, may have a greater likelihood of producing an undermining effect of performance goals on intrinsic motivation (Ryan et al., 1991; Sansone, 1986). Although a direct test of this hypothesis is not available in the literature, it is possible that at a between-studies level, the distinction between ego-involving and normative performance goals may account for the inconsistency of the performance versus mastery goal effect in the extant literature.

Confirming Versus Nonconfirming Feedback

Between-study variation in the administration of performance feedback is a second, alternative factor that may explain the inconsistency of study outcomes. The majority of achievement-goal/intrinsic-motivation experiments have employed a "free-choice" paradigm to obtain behavioral measures of intrinsic motivation (see Deci, 1971). In this procedure, the participant is left alone in the laboratory at the end of the session with the opportunity to return to the experimental task or engage in a variety of other activities (e.g., read a magazine). During this free-choice period, the participant's behavior is unobtrusively observed, and persistence at the experimental activity is interpreted as a sign of intrinsic motivation. Because participants believe the experiment is over and are unaware of being observed, extrinsic reasons for returning to the experimental task are eliminated. Therefore, it is inferred that the sole motive for reengaging in the activity is the feeling of interest and enjoyment derived from the behavior itself.

Ryan and his colleagues (Ryan et al., 1991) posited that the validity of free-choice persistence measures as an indicator of intrinsic motivation is contingent on whether participants receive performance feedback that confirms their competence at the experimental activity. These researchers reasoned that participants pursuing performance goals are primarily concerned with demonstrating their competence at the activity. Positive performance feedback would function to confirm their competence, thereby satisfying their goal and eliminating any instrumental motivation to further engage with the task. However, when feedback is negative or when participants do not receive any feedback, individuals with a performance goal may persist at the activity in a pressured attempt to advance their normative standing and demonstrate (albeit to themselves) their competence—behavior that Ryan et al. termed *ego-involved persistence.* Thus, when participants receive positive feedback, persistence at the task during a free-choice period would constitute a legitimate indicator of intrinsic motivation. In the absence of confirming feedback, however, task engagement during a free-choice period would not reflect intrinsic motivation but would represent a Zeigarnik-like persistence in which individuals strive to reach their unattained goals.

Ryan et al. (1991) provided empirical support for this feedback hypothesis by inducing ego and task involvement and providing participants with either confirming or nonconfirming performance feedback. Ego involvement produced the expected undermining effect on behavioral persistence when participants received positive, competence-confirming feedback. In contrast, when feedback was nonconfirming, the effect was reversed, with ego-involved participants demonstrating greater free-choice persistence than individuals in the task-involvement condition. These findings suggest that the inconsistency of the undermining effect of performance goals in the published literature may be explained by between-study variation in the administration of performance feedback. From this standpoint, studies that provide positive, competence-confirming feedback are predicted to find an undermining effect of performance goals relative to mastery goals on measures of free-choice persistence. Studies that provide negative or no feedback, however, are predicted to find null differences (or even enhancement effects) between mastery and performance goals on behavioral measures. For self-reports of interest and enjoyment of the experimental activity, another commonly used indicator of intrinsic motivation, an undermining effect of performance goals would be predicted regardless of whether participants received competence-confirming or nonconfirming feedback.

Performance-Approach Versus Performance-Avoidance Goals

A third factor that may account for the variation in experimental outcomes is whether participants pursuing a performance goal are focused on the possibility of a positive or negative performance outcome. Early theories of achievement motivation emphasized that individuals' achievement pursuits may be oriented toward the attainment of success or the avoidance of failure (Lewin, Dembo, Festinger, & Sears, 1944; McClelland, Atkinson, Clark, & Lowell, 1953). Elliot and his colleagues (Elliot, 1997; Elliot & Church, 1997; Elliot & Harackiewicz, 1996) proposed an achievement goal framework that incorporates this approach–avoidance distinction into the prevailing performance versus mastery dichotomy. This tri-

chotomous conceptualization identifies a *mastery goal,* which is focused on task mastery and the development of competence, and two independent approach and avoidance performance-goal orientations: a *performance-approach goal,* which is focused on the attainment of favorable judgments of normative competence, and a *performance-avoidance goal,* which is focused on avoiding unfavorable judgments of normative competence. Mastery goals and performance-approach goals both represent regulation according to positive potential outcomes and are thus considered approach orientations. The performance-avoidance goal represents regulation according to a negative potential outcome and is thus viewed as an avoidance orientation.

Elliot and his colleagues (mentioned in the previous paragraph) maintained that the approach–avoidance distinction is critical to understanding the relation between achievement goals and intrinsic motivation. They posited that approach forms of regulation, whether focused on mastering the task at hand or on outperforming others, can produce processes that facilitate intrinsic motivation. Striving to attain success, however defined, may lead individuals to view the task as a challenge, elicit feelings of excitement, and encourage cognitive and affective immersion in the activity. In contrast, performance-avoidance goals, which are focused on the possibility of failure, are hypothesized to produce threat appraisals and elicit anxiety, processes that are detrimental to intrinsic motivation. Therefore, relative to performance-approach and mastery goals, performance-avoidance goals are expected to produce lower intrinsic motivation.

To test these predictions, Elliot and Harackiewicz (1996) conducted two experiments in which they manipulated individuals' achievement goals and observed the influence of these goal states on participants' intrinsic motivation for a puzzle-solving task. In the first experiment, performance-approach and performance-avoidance orientations were established by presenting the task as diagnostic of high or low normative ability, respectively. The second experiment used a more subtle manipulation. After informing participants that their performance would be normatively evaluated, the experimental instructions simply mentioned the possibility of success or failure at the activity. In both studies, the performance-goal conditions were contrasted with a mastery goal condition in which participants' attention was simply drawn to the task without mention of normative evaluation. The results of both experiments indicated that individuals in the performance-approach and mastery conditions evidenced equivalent levels of intrinsic motivation, and both of these groups showed significantly greater intrinsic motivation than participants in the performance-avoidance condition.

The results of these studies suggest that a critical moderator of the achievement goal–intrinsic motivation relation may be whether the individual is striving to attain success or to avoid the possibility of failure. Studies employing procedures that focus participants' attention on the possibility of a negative performance outcome may evoke an avoidance orientation and produce an undermining effect on intrinsic motivation. However, in the absence of failure cues, participants pursuing performance goals may focus on the potential for success and demonstrate levels of intrinsic motivation that are near or equal to that of mastery-oriented individuals.

Overview and Summary

In the first stage of this meta-analysis, we examine the main effect hypothesis in the experimental literature by summarizing the magnitude and direction of the performance versus mastery goal effect across studies. This addresses the question of whether performance goals overall undermine intrinsic motivation relative to mastery goals. In the second stage of the analysis, we attempt to account for the inconsistency of the performance versus mastery goal effect by examining three alternative factors as potential moderators of the effect. Each study was coded for these potential moderators, and model-testing techniques were used to determine whether the dichotomous classifications were able to explain the variability in study outcomes.

First, studies were coded for whether the performance-goal manipulation was designed to induce ego involvement or simply to introduce a normative referent for evaluation. Several researchers have suggested that ego-involvement manipulations may be threatening to participants and produce greater evaluation anxiety than normative manipulations (Harackiewicz & Elliot, 1993; Ryan et al., 1991; Sansone, 1986). From this perspective, studies using an ego-involvement induction should have a greater undermining effect than studies using a normative manipulation.

Next, studies were classified according to whether participants were provided with feedback that confirmed their competence at the experimental activity. According to Ryan et al. (1991), an undermining effect of performance goals on free-choice persistence is to be expected only under conditions in which participants receive competence-confirming feedback. In the absence of such feedback, individuals pursuing performance goals may persist at the activity to demonstrate their competence, producing null findings or even enhancement effects. From this perspective, performance goals are predicted to have a larger undermining effect

on free-choice persistence for studies providing participants with positive, competence-confirming feedback than for studies administering negative or no performance feedback. This viewpoint only generates between-class predictions for behavioral measures; the main effect hypothesis is presumed to hold for self-report measures of interest and enjoyment.

Finally, studies were coded for factors that might focus participants on the possibility of a negative performance outcome, thereby instantiating a performance-avoidance goal. Elliot and colleagues (Elliot, 1997; Elliot & Church, 1997; Elliot & Harackiewicz, 1996) distinguished performance-avoidance from performance-approach goals and posited that performance-avoidance goals are the primary impediment to intrinsic motivation. From this perspective, studies that instantiate performance-avoidance goals should produce a larger undermining effect than studies instantiating performance-approach goals.

Method

Literature Search

First, articles were located through a computer search of the PsycINFO (American Psychological Association, 1971–1997) database covering the published literature from 1971 (the year Deci's seminal article on intrinsic motivation was published) through 1997. The keywords used were *intrinsic motivation, intrinsic interest, continuing motivation, achievement goals, performance goals, ability goals, learning goals, mastery goals, task-involvement,* and *ego-involvement.* Additional articles were located by manually searching the reference sections of several narrative reviews of the intrinsic motivation and achievement goal literatures (e.g., Deci & Ryan, 1987; Heyman & Dweck, 1992). Finally, the reference sections of all articles deemed relevant to this review (see next section) were searched until no new references were found. All studies available in published form were considered for inclusion in the meta-analysis.

Inclusion Criteria

To be included in the meta-analysis, a study had to meet each of the criteria listed next. First, the study had to contain a situation-specific experimental manipulation of performance and mastery achievement goals. This criterion led to the exclusion of correlational research that assessed participants' self-reported achievement goals (e.g., Elliot & Church, 1997) or dispositional achievement orientations (e.g., Harter, 1981) and studies that manipulated variables such as rewards, deadlines, surveillance, praise, target goals, and competition (see Amabile, DeJong, & Lepper, 1976; Deci, Koestner, & Ryan, 1999; Elliot & Harackiewicz, 1994; Enzle & Anderson, 1993; Mueller & Dweck, 1998; Vallerand, Gauvin, & Halliwell, 1986). Second, achievement goals had to be established for an enjoyable or pleasurable experimental activity. Research on the development of intrinsic motivation for tedious or uninteresting tasks (Bandura, 1986; Locke & Latham, 1990; Sansone, Weir, Harpster, & Morgon, 1992) was outside the focus of this review and was not considered. Third, the study had to include a behavioral or self-report measure of intrinsic motivation. The behavioral indicator of intrinsic motivation was persistence at the experimental task during a free-choice period (measured by either length of task engagement or number of additional puzzles, games, etc. attempted). Self-report indicators were comprised of participants' responses to scales assessing interest and enjoyment of the experimental activity and indications of a desire for future engagement with the task (e.g., number of additional tasks requested at the end of the session). Finally, the research report had to contain sufficient statistical information (e.g., cell means and standard deviations, F tests) to calculate an estimate of effect size. Application of these criteria led to the inclusion of 23 separate experiments.[1]

Determination of Comparison Cells

Effect size estimates were based on comparisons of the level of intrinsic motivation demonstrated by

[1]The majority of studies included in this meta-analysis were explicitly designed to be investigations of the performance versus mastery goal distinction. For these studies, our inclusion decisions were guided by the authors' designations of their goal manipulations (e.g., ego vs. task involvement, performance vs. learning goals). To increase the comprehensiveness of our review, however, we also considered studies of intrinsic motivation that were not originally designed to examine achievement goal effects but that established performance and mastery orientations via the manipulation of another variable. Specifically, we included two studies (Butler & Nisan, 1986; Sansone et al., 1989) in which the provision of performance feedback following initial engagement with the experimental task (e.g., on practice trials) focused participants' attention on normative evaluation (thereby establishing a performance goal) or on task mastery (establishing a mastery orientation).

If sufficient information was not provided in the published report, efforts were made to contact the author and obtain the necessary statistics. Overall, our efforts were quite successful. Only three studies meeting the remaining criteria had to be excluded due to our inability to obtain the requisite descriptive statistics for calculating an effect size estimate (Boggiano, Ruble, & Pittman, 1982; Harackiewicz & Manderlink, 1984; Sansone, 1986).

participants in performance and mastery goal conditions. However, the design of most experiments crossed the manipulation of achievement goals with one or more moderator variables. If the moderator was a nonmanipulated individual-difference variable, we collapsed across the factor when calculating the effect size. Collapsing across experimentally manipulated variables, however, can add extraneous variance to the comparison cells and reduce the accuracy of effect size estimates (Johnson & Eagly, in press). Therefore, for studies that manipulated moderator variables, calculations were based, whenever possible, on a comparison of mastery and performance goal cells within control conditions in which the manipulation of other variables was absent.[2] In the case that the manipulated variable was one of the moderators under investigation in this meta-analysis, separate comparisons were made within each level of the variable, and the study contributed more than one effect size.[3] This procedure produced 30 performance versus mastery goal comparisons for use in the meta-analysis.[4] A complete list of included studies and comparison cells is provided in the Appendix.

Coding Moderator Variables

Each comparison was coded for whether (a) the performance-goal manipulation was designed to induce ego involvement (ego involvement vs. normative), (b) the participants received performance feedback confirming their competence on the experimental task (confirming vs. nonconfirming feedback), and (c) the experimental procedures instantiated an approach or avoidance performance goal (performance-approach vs. performance-avoidance).

Performance-goal manipulations were coded ego-involving if the task was presented as a test of intelligence (e.g, Ryan, 1982) or in a manner suggesting that performance was indicative of a valued skill or ability (e.g., creative ability; Butler, 1992). If the task was presented in a way that emphasized normative evaluation and social comparison without explicitly stating that performance reflected an esteem-relevant skill or attribute, the performance-goal manipulation was classified as having a normative focus (e.g., Harackiewicz & Elliot, 1993).

The criteria for coding confirming and nonconfirming feedback were based on the valence of performance feedback and the point in the experiment at which it was administered. When performance feedback was provided on completion of the task, a comparison was coded confirming if the feedback was positive. If the feedback was negative or if participants did not receive any performance feedback, a comparison was classified nonconfirming. When feedback was administered on a per trial basis, a comparison was coded confirming if feedback on latter trials was positive. Negative scores or the absence of feedback on latter trials resulted in a nonconfirming classification.

The criteria for coding performance goals as approach or avoidance were based on aspects of the experimental procedures that focused participants' attention on the possibility of a positive or negative performance outcome. When the pretask experimental instructions made salient the potential for a good performance, performance goals were classified approach. Conversely, performance goals were coded avoidance when the pretask instructions made salient the potential for a poor performance. An example of coding based on pretask instructional cues was provided by Elliot and Harackiewicz (1996). If the pretask experimental instructions did not contain an explicit orienting cue, approach and avoidance coding was based on feedback administered prior to (i.e., following a practice trial) or during (i.e., on early to mid-trial of) task engagement. When such feedback was negative, performance goals were classified as avoidance. When such feedback was positive or when no feedback was given, performance goals were classified as approach (the inclusion of "no feedback" comparisons in the performance-approach classification provides a conservative test of the approach–avoidance hypothesis). An example of ap-

[2]For example, Koestner et al. (1987) crossed a manipulation of ego involvement versus task involvement with the administration of ability-focused or effort-focused verbal praise. The investigators also included a control condition in which no praise was given. In this case, the effect size estimate was based on a comparison of ego- and task-involvement cells within the no-praise condition. In a subsequent experiment, however, Koestner et al. (1989) crossed the same variables but omitted the no-praise control cells. In this later case, calculations were necessarily based on a comparison of goal states collapsed across praise conditions.

[3]For example, Ryan et al. (1991, Study 3) crossed an ego- versus task-involvement manipulation with the provision of either positive or no performance feedback. Because the feedback manipulation is central to the free-choice persistence hypothesis, separate comparisons were made within each feedback condition, and the study contributed two independent effect sizes to the analysis.

[4]For studies contributing multiple effect sizes, independence was preserved in studies using factorial designs because the effect sizes were based on data derived from different participants. However, three studies (e.g., Elliot & Harackiewicz, 1996) employed one-way designs that included separate approach and avoidance performance goal conditions and a single mastery goal condition. Effect size calculations were necessarily based on comparisons of performance-approach and performance-avoidance cells with the same mastery goal condition, rendering the two indexes statistically dependent. Gleser and Olkin (1994) argued that the use of correlated effect sizes for across-studies inferences (like those used in this analysis) is valid, although comparison of the derived effect sizes underestimates the true difference between the population effect sizes. Because this represents a conservative approach, we deemed it optimal to use the comparisons to test our hypotheses.

proach–avoidance coding based on feedback was provided by Sansone et al. (1989, Study 1). It is important to note that the approach–avoidance classifications based on feedback were orthogonal to the confirming–nonconfirming classifications specified previously, $\chi^2(1, N = 30) < 1$, *ns*.

Coding was performed independently by Laird J. Rawsthorne and a trained research assistant. Interrater reliability was assessed using Cohen's kappa, which reflects the agreement between observers corrected for chance (Cohen, 1960). Bakeman and Gottman (1989) maintained that a value above .70 indicates acceptable reliability. This value was surpassed for each of these classifications: $\kappa = .93$ for the ego-involvement versus normative and approach versus avoidance classifications, and $\kappa = .86$ for the confirming versus nonconfirming feedback ratings,. Disagreements were resolved through discussion.

Overview of Meta-Analytic Procedures

Calculation of effect sizes. The effect size index employed in this meta-analysis was Cohen's *d*. The *d* statistic represents the difference between the means of two groups divided by the pooled within-group standard deviation and corrected for sample size bias (Hedges & Olkin, 1985). Thus, *d* can be interpreted as a standardized unbiased estimate of the mean difference between performance goal and mastery goal groups. The effect sizes were scored so that a negative *d* statistic represented an undermining effect of performance goals relative to mastery goals and a positive *d* represented an enhancement effect. Cohen's *d* can be derived from a variety of statistics commonly reported in published research reports. When available, *d* was computed from cell means, standard deviations, and sample sizes. If these descriptive statistics were not reported, *d* was derived from *t* or *F* statistics for main effects, simple effects or contrasts, or from zero-order correlation coefficients.

Intrinsic motivation has been operationalized in the literature using behavioral measures of free-choice persistence, self-report measures of interest and enjoyment, or both. As explicated previously, Ryan et al. (1991) offered both a theoretical rationale and empirical evidence that behavioral and self-report measures may not always yield parallel results. Accordingly, we computed separate effect sizes for each measure and conducted all analyses separately for behavioral and self-report indicators of intrinsic motivation. Effect size computations and subsequent analyses were conducted using DSTAT (Johnson, 1990), a computer software program for meta-analysis.

Summary analyses. Once individual effect sizes were computed, we calculated composite effect size estimates (d^+) for the behavioral and self-report measures. The composite indexes indicate the direction and magnitude of the effect averaged across studies. In computing the composites, each individual *d* was weighted by the reciprocal of its variance to give greater weight to more reliable effect size estimates (Hedges & Olkin, 1985). Next, 95% confidence intervals were computed to provide a test of the main effect hypothesis (a confidence interval that included a value of 0 was interpreted as a nonsignificant effect). The homogeneity of each set of effect sizes was further examined to determine if the variability in study outcomes was greater than would be expected on the basis of sampling error. Homogeneity was tested with the within-class goodness-of-fit statistic (Q_W), which has an approximate chi-square distribution with $k - 1$ degrees of freedom (k = number of effect sizes). A significant Q_W statistic indicates systematic variance among effect sizes and suggests the need to examine moderator variables that may account for differences in the effect across studies.

Categorical model testing. Categorical models were tested by dividing the effect sizes into classes on the basis of the coded moderator variables, calculating within-class composite effect sizes, and comparing the composites between classes. For example, to test the performance-approach model versus the performance-avoidance model, effect sizes were first divided into classes according to the categorical coding described previously. Mean weighted effect size estimates (d^+) were computed for comparisons of performance-approach goals with mastery goals, and separate weighted composites were computed for comparisons of performance-avoidance goals with mastery goals. The performance-approach versus mastery composites were then contrasted with the performance-avoidance versus mastery composites to determine if they differed significantly. The test is conducted by computing the between-class goodness-of-fit statistic (Q_B), which has an approximate chi-square distribution with $p - 1$ degrees of freedom (p = number of classes). A significant Q_B statistic indicates that the magnitude of the effect differs between classes of the moderator variable and permits meaningful interpretation of the within-class composite effect sizes. In addition, tests of within-class homogeneity were conducted to determine whether the categorical model could account for the variability in effect sizes across studies. A categorization producing within-class homogeneity (indicated by nonsignificant Q_W statistics) indicates that the moderator can explain the inconsistency of the effect across studies.

Results

Effect Sizes

Of the 30 performance versus mastery goal comparisons used in the meta-analysis, 22 included both self-report and behavioral measures of intrinsic motivation, 7 included only a self-report measure, and 1 included only a behavioral measure. Hence, 23 effect sizes were available for behavioral measures of intrinsic motivation, and 29 effect sizes were available for self-report measures. A complete list of individual effect sizes and corresponding confidence intervals is provided in the Appendix.

Summary Analyses

As presented in Table 1, the composite effect size for behavioral measures was $d^+ = -0.17$, which differed significantly from zero. This indicates that, when averaged across the entire sample of studies, the pursuit of performance goals produced significantly less free-choice task persistence than the pursuit of mastery goals. According to Cohen's (1988) guidelines, a d statistic of this magnitude represents a relatively small effect. The composite effect size for self-report measures was $d^+ = -0.36$, indicating a small to moderate undermining effect of performance goals on self-reports of interest and enjoyment. However, inspection of the individual self-report effect sizes revealed the presence of three studies contributing extremely large negative effect sizes $(> |-1.00|)$ that could considerably inflate the self-report composite (Butler, 1987, 1988; Butler & Nisan, 1986). An outlier analysis, which sequentially identifies effect sizes that most increase the heterogeneity of the set (see Johnson & Eagly, in press), confirmed the status of these studies as outliers.

Because (a) the three studies were conducted by the same primary investigator and were methodologically homogeneous and (b) the inclusion of these outliers could skew the analysis and distort the results, we felt that it was most appropriate to treat the studies as a separate class and to recalculate the overall self-report composite with the three outliers removed. As shown in the third row of Table 1, exclusion of the outliers resulted in a composite effect size of $d^+ = -0.12$, which differed significantly from zero. This indicates a small but significant undermining effect of performance goals on self-reports of interest and enjoyment that parallels the effect found for free-choice persistence.

In summary, the overall composites support the main effect hypothesis. When averaged across studies, performance goals were associated with significantly less behavioral persistence and self-report interest and enjoyment than were mastery goals. Conclusions based on the overall composites, however, must be qualified in view of the substantial variation in the magnitude and direction of effect across studies. As shown in the far right column of Table 1, the homogeneity statistics (Q_W) for the behavioral and self-report measures were significant, indicating systematic variability in the magnitude and direction of the effect across studies. In the following sections, we attempt to explain this variability by examining variables that might moderate the effect.

Categorical Model Testing

As with the summary analyses, we were concerned that inclusion of the three outliers would inflate within-class heterogeneity and composite effect sizes and distort important findings. For this reason, we conducted the moderator analyses for the self-report measures twice, once with the outliers included and again with the outliers removed. For presentational and conceptual clarity, moderator analyses are reported and interpreted with the outliers removed. Any deviations in the pattern of findings resulting from inclusion of the outliers are detailed in footnotes, and further consideration of these studies is reserved for the discussion.

Ego-involvement versus normative performance goals. Between-class analyses failed to find significant differences between the ego-involvement and normative composites on both behavioral measures, $Q_B(1) = 2.06$, *ns,* and self-report measures, $Q_B(1) =$

Table 1. *Overall Performance Versus Mastery Goal Composite Effect Sizes*

Measure	k	d^+	95% CI	Homogeneity (Q_W)
Behavioral	23	–0.17	–0.28 to –0.05	32.81*
Self-Report				
With Outliers	29	–0.36	–0.46 to –0.26	178.26**
Without Outliers	26	–0.12	–0.23 to –0.01	45.32**

Note: k = number of effect sizes; d^+ = mean weighted effect size; CI = confidence interval; Q_W = within-class goodness-of-fit statstic.
*$p < .05$. **$p < .01$.

0.43, *ns*. These null effects caution against the interpretation of within-class analyses and prevent us from drawing conclusions based on the within-class composite effect sizes. However, to be comprehensive in our presentation, we report the within-class analyses in Table 2. The composite effect sizes for ego-involvement and normative classes were in the predicted direction for self-report measures of interest and enjoyment (d^+ = –0.17 and –0.09, respectively) but in the opposite direction for behavioral measures of free-choice persistence (d^+ = –0.06 and –0.23, respectively).[5] Homogeneity tests revealed systematic variance left unexplained for ego-involvement studies on behavioral measures as well as for normative studies on self-report measures. In sum, the analyses of the ego-involvement versus normative model yield no clear pattern of results and provide little evidence that the ego-involvement/normative distinction can explain the variability in study outcomes.[6]

Confirming versus nonconfirming feedback. Analyses of the confirming versus nonconfirming feedback model revealed a significant between-class effect for measures of behavioral persistence, $Q_B(1) = 5.60$, $p < .05$. As shown in Table 3, the behavioral composite for confirming-feedback comparisons was $d^+ = -0.26$, which differed significantly from zero, and the nonconfirming feedback composite was $d^+ = +0.03$, which was nonsignificant. The between-class analysis for self-report measures of interest and enjoyment revealed no significant difference in the magnitude and direction of the confirming and nonconfirming composite effect sizes, $Q_B(1) = 2.09$, *ns*. Indeed, the composite effect sizes were nearly identical, $d^+ = -0.13$ and $d^+ = -0.11$ for confirming and nonconfirming comparisons, respectively.[7] Additional analyses conducted within the nonconfirming feedback class revealed no significant differences between studies providing negative feedback and no feedback on either the behavioral, $Q_B(1) = 1.10$, *ns*, or self-report, $Q_B(1) = 0.31$, *ns*, measures.

The between-class differences on behavioral persistence provide support for Ryan et al.'s (1991) confirming–nonconfirming feedback hypothesis. When participants were provided with positive, competence-confirming feedback, performance goals had the predicted undermining effect on free-choice persistence. In the absence of confirming feedback, however, performance and mastery goals were associated with equivalent behavioral persistence. The null effect for self-report measures is also consistent with the confirming–nonconfirming feedback hypothesis, which does not predict differences between classes of feedback for self-report indicators of intrinsic motivation. In addition, the within-class homogeneity tests were nonsignificant for the behavioral measures, indicating that the confirming–nonconfirming feedback distinction can account for the variability in outcomes on the free-choice persistence measure. For self-report measures, however, the homogeneity statistic for the confirming feedback class was significant, indicating systematic variability in the self-report effect sizes left unexplained by the model. Thus, although the confirming–nonconfirming feedback distinction can explain the variability of the achievement goal effect for behavioral measures of free-choice persistence, it is does not account for the inconsistency of the effect for self-report measures of interest and enjoyment.

Performance-approach versus performance-avoidance goals. Between-class analyses revealed significant differences between the performance-approach and performance-avoidance composite effect sizes on both behavioral measures of free-choice persistence, $Q_B(1) = 10.77$, $p < .001$, and self-report measures of interest and enjoyment, $Q_B(1) = 4.49$, $p < .05$. As shown in Table 4, the behavioral composite for studies instantiating a performance-approach goal was $d^+ = -0.04$, which did not differ significantly from zero. This within-class effect indicates that across studies, performance-approach and mastery goals yielded equivalent levels of free-choice persistence. In contrast, the avoidance composite was $d^+ = -0.46$, revealing a significant undermining effect of performance-avoidance goals relative to mastery goals. A

[5]Inclusion of the three outliers increased the normative composite for self-report measures to $d^+ = -0.45$ ($k = 19$); the within-class homogeneity statistic to $Q_W = 161.81$, $p < .0001$; and the between-class contrast to $Q_B(1) = 6.63$, $p < .01$.

[6]A similar goal strength distinction can be made for mastery goals. We conducted ancillary analyses contrasting studies using a relatively strong mastery goal manipulation (which explicitly emphasized the development of skills and abilities) with studies using a relatively weak mastery goal manipulation (which simply directed participants' attention toward the task). For the self-report measures of interest and enjoyment, we found no differences in the magnitude of the performance versus mastery effect between studies inducing strong and weak mastery goals, $Q_B(1) = 0.003$, *ns*. For the behavioral measures, however, our analyses revealed a larger undermining effect of performance goals for studies inducing relatively weak mastery goals ($d^+ = -0.24$, $k = 17$) than for studies inducing relatively strong mastery goals ($d^+ = 0.06$, $k = 6$), $Q_B(1) = 4.87$, $p < .05$. This finding is counterintuitive and difficult to interpret, and overall these results suggest that explanatory precision and conceptual clarity are not likely to be attained by attending to the strength of the mastery goal induction.

[7]Inclusion of the three outliers increased the nonconfirming feedback composite for self-report measures to $d^+ = -0.66$ ($k = 12$); the corresponding within-class homogeneity statistic to $Q_W = 123.13$, $p < .0001$; and the between-class contrast to $Q_B(1) = 26.12$, $p < .0001$.

Table 2. *Moderator Analyses: Ego-involvement Versus Normative Performance Goals*

Class	*k*	d^+	95% CI	Homogeneity (Q_W)
Behavioral				
Ego-Involvement	9	–0.06	–0.25 to +0.14	19.73*
Normative	14	–0.23	–0.37 to –0.09	11.01
Self-Report				
Ego-Involvement	10	–0.17	–0.34 to +0.01	9.83
Normative	16	–0.09	–0.23 to +0.05	35.07*

Note: *k* = number of effect sizes; d^+ = mean weighted effect size; CI = confidence interval; Q_W = within-class goodness-of-fit statstic.
*$p < .01$.

Table 3. *Moderator Analyses: Confirming Versus Nonconfirming Feedback*

Class	*k*	d^+	95% CI	Homogeneity (Q_W)
Behavioral				
Confirming Feedback	15	–0.26	–0.40 to –0.12	18.43
Nonconfirming Feedback	8	+0.03	–0.17 to +0.24	8.78
Self-Report				
Confirming Feedback	17	–0.13	–0.26 to +0.01	29.01
Nonconfirming Feedback	9	–0.11	–0.30 to +0.08	16.29*

Note: *k* = number of effect sizes; d^+ = mean weighted effect size; CI = confidence interval; Q_W = within-class goodness-of-fit statstic.
*$p < .05$.

Table 4. *Moderator Analyses: Performance-Approach Versus Performance-Avoidance Goals*

Class	*k*	d^+	95% CI	Homogeneity (Q_W)
Behavioral				
Performance-Approach	17	–0.04	–0.18 to +0.10	19.39
Performance-Avoidance	6	–0.46	–0.67 to –0.25	2.64
Self-Report				
Performance-Approach	18	–0.04	–0.17 to +0.09	27.94
Performance-Avoidance	8	–0.29	–0.49 to –0.10	12.89

Note: *k* = number of effect sizes; d^+ = mean weighted effect size; CI = confidence interval; Q_W = within-class goodness-of-fit statstic.

parallel pattern of results was found for self-report measures. The self-report composite for comparisons of performance-approach and mastery goals was d^+ = –0.04, which was not significant. This indicates the absence of an undermining effect for performance-approach goals on self-report measures of interest and enjoyment. In contrast, the avoidance composite was d^+ = –0.29, revealing a significant undermining effect of performance avoidance goals on self-report interest and enjoyment.[8]

Additional analyses were conducted within the performance-avoidance class to test for differences between studies classified as avoidance due to a pretask orienting cue or due to the administration of negative feedback prior to or during task engagement. No significant differences were found for either behavioral, $Q_B(1)$ = 1.04, *ns,* or self-report, $Q_B(1)$ = 1.57, *ns,* measures. The undermining effect was found to hold across both the orienting cue (behavioral d^+ = –0.58, *k* = 3; self-report d^+ = –0.41, *k* = 5) and feedback (behavioral d^+ = –0.36, *k* = 3; self-report d^+ = –0.16, *k* = 3) classifications.

Together, these findings provide clear support for the performance-approach/performance-avoidance hypothesis. Relative to mastery goals, performance-avoidance goals had a significant undermining effect on free-choice persistence and self-reports of interest and enjoyment. No evidence of an undermining effect was found, however, for comparisons of performance-approach and mastery goals. In addition, the within-class homogeneity tests were nonsignificant, indicating that the performance-approach/performance-avoidance distinction could explain the variability in study outcomes for both the behavioral and self-report measures.

In sum, the results of the moderator analyses found support for both the confirming–nonconfirming

[8]Inclusion of the three outliers increased the performance-avoidance composite for self-report measures to d^+ = –0.79, *k* = 11; the within-class homogeneity statistic to Q_W = 98.13, $p < .0001$; and the between-class contrast to $Q_B(1)$ = 52.19, $p < .0001$.

feedback and the performance-approach/performance-avoidance hypotheses but failed to find evidence supporting the ego-involvement/normative prediction. A remaining conceptual issue, however, suggests the need for further analyses. According to Ryan et al. (1991), in the absence of competence-confirming feedback, free-choice persistence may not be a valid indicator of intrinsic motivation for participants pursuing performance goals. Under such conditions, persistence at the task during a free-choice period is likely to reflect a pressured attempt to prove one's ability rather than interest in and enjoyment of the activity itself. This possibility has implications for our model-testing analyses. If the free-choice persistence measure did in fact reflect ego-involved persistence in the nonconfirming feedback comparisons, then our tests of the ego-involvement/normative and performance-approach/performance-avoidance hypotheses were based, in part, on an "impure" indicator of intrinsic motivation. Inclusion of the nonconfirming feedback comparisons may have prevented us from finding ego-involvement/normative differences or added a confound to the performance-approach/performance-avoidance model. To address this issue, we retested the ego-involvement/normative and performance-approach/performance-avoidance models for the free-choice persistence measure with the nonconfirming feedback comparisons excluded.

When limited to comparisons providing competence-confirming feedback, the between-class analysis of the ego-involvement/normative model again found no significant difference between the ego-involvement ($d^+ = -0.18$, $k = 7$) and normative ($d^+ = -0.33$, $k = 8$) composite effect sizes, $Q_B(1) = 1.11$, *ns*. This null result argues against the possibility that significant ego-involvement/normative differences in intrinsically motivated free-choice behavior were obscured by the presence of ego-involved persistence in the nonconfirming feedback comparisons. Even when restricted to a more accurate indicator of intrinsic motivation, no differences between studies employing ego-involvement and normative performance goal manipulations were found.

The between-class analysis of the performance-approach/performance-avoidance model revealed a significant difference between the performance-approach ($k = 11$) and performance-avoidance ($k = 4$) composites, $Q_B(1) = 5.64$, $p < .02$. Tests of the within-class composites indicated that performance-avoidance goals had a significant undermining effect on free-choice persistence, relative to mastery goals, $d^+ = -0.51$, $p < .01$. Performance-approach goals, on the other hand, produced a level of free-choice persistence that was not significantly different from that of mastery goals, $d^+ = -0.15$, *ns*. These findings, based on analyses limited to the confirming feedback comparisons, rule out the possibility of confounding and testify to the robustness of the performance-approach/performance-avoidance distinction.[9]

Discussion

The first objective of this meta-analysis was to examine the evidence for the main effect hypothesis in the existing experimental literature. That is, we sought to determine whether the pursuit of performance goals has an undermining effect on intrinsic motivation, relative to the pursuit of mastery goals. Consistent with the theorizing of Deci and Ryan (1985), Dweck (1986), Nicholls (1989), and others, we found that, overall, the pursuit of performance goals produced significantly less free-choice persistence and self-report interest and enjoyment than did the pursuit of mastery goals. The magnitude of the summary composites indicated that the undermining effect of performance goals was relatively small when averaged across the entire sample of experiments. The results of these summary analyses must be qualified, however, because the magnitude and direction of the effect was found to vary systematically across studies. This later finding suggests that the critical issue is not only to determine whether performance goals undermine intrinsic motivation relative to mastery goals but also to determine when an undermining effect of performance goals is or is not likely to occur. Thus, the second objective of this meta-analysis was to explain the variation in study outcomes in the extant literature. To meet this objective, we examined three alternative factors that might moderate the relation between performance and mastery goals and intrinsic motivation at a between-studies level.

The moderator analyses failed to support the hypothesis that studies designed to induce ego involvement would produce a larger undermining effect than studies that manipulated performance goals by emphasizing normative evaluation alone. No significant differences in the magnitude or direction of the performance versus mastery goal effect were found between the two classes of studies, and homogeneity tests indicated that the ego-involvement/normative distinc-

[9]For reasons detailed in the following discussion, we also tested the performance-approach/performance-avoidance goal model within the nonconfirming feedback class for behavioral measures. This analysis revealed a significant between-class difference for approach and avoidance performance goals, $Q_B(1) = 4.43$, $p < .04$, with a tendency toward an enhancement effect of performance-approach goals over mastery goals ($d^+ = +0.16$, $k = 6$) and an undermining effect of performance-avoidance goals relative to mastery goals ($d^+ = -0.33$, $k = 2$).

tion was unable to explain the variability of the effect across studies.

Our analyses did find support, however, for the hypothesis that performance goals produce a larger undermining effect on behavioral measures of intrinsic motivation for studies providing participants with positive, competence-confirming feedback than for studies administering negative or no performance feedback. The magnitude of the performance versus mastery goal effect differed significantly between the confirming and nonconfirming feedback classes. When participants were provided with positive feedback, performance goals had a significant undermining effect on free-choice persistence relative to mastery goals. When feedback was negative or absent, performance and mastery goals produced equivalent persistence during the free-choice period. Furthermore, homogeneity tests revealed that the confirming–nonconfirming feedback distinction was able to explain the inconsistency of the performance versus mastery effect for behavioral measures of intrinsic motivation but was unable to account for the variability of the effect for self-report measures. Thus, it is important to note that the explanatory power of the confirming versus nonconfirming feedback model is limited.

The moderator analyses also found strong support for the hypothesis that performance goals produce a larger undermining effect when experimental procedures focus participants' attention on the possibility of a negative performance outcome, thereby inducing a performance-avoidance orientation. Across several studies conducted by different researchers using divergent tasks and experimental paradigms, performance-avoidance goals had a deleterious effect on participants' intrinsic motivation, reflected in lower free-choice persistence and self-reports of interest and enjoyment. In contrast, performance goals classified as having an approach orientation did not produce evidence of an undermining effect. The analyses revealed that participants pursuing performance-approach goals demonstrated levels of intrinsic motivation equivalent to that of individuals pursuing mastery goals. In addition, the approach–avoidance performance-goal classification produced homogeneous classes of effect sizes for both behavioral and self-report measures of intrinsic motivation, indicating that the distinction between performance-approach and performance-avoidance goals can fully account for the variability in the performance versus mastery goal effect.

Thus, this meta-analysis succeeded in identifying factors that can explain the inconsistency of experimental outcomes in the achievement-goal/intrinsic-motivation literature. Support was found for the confirming–nonconfirming feedback and performance-approach/performance-avoidance goal hypotheses but not for the ego-involvement/normative prediction. Homogeneity tests indicated that the confirming versus nonconfirming feedback model could only explain the variability of the effect for the free-choice persistence measure, whereas the performance-approach/performance-avoidance goal model could account for the variation in study outcomes across both behavioral and self-report indicators of intrinsic motivation.

Implications and Directions for Future Research

The results of the performance-approach/performance-avoidance goal model suggest that future theoretical and empirical work on achievement goals and intrinsic motivation would benefit by attending to the approach–avoidance distinction as well as the performance versus mastery distinction. These findings suggest that the effect of performance goals on intrinsic motivation is contingent on whether the person is striving to attain a positive outcome or avoid a negative one. The pursuit of performance-avoidance goals had a deleterious effect on intrinsic motivation, and it is our expectation that this effect would be found across most if not all achievement contexts. Using a negative possibility as the hub of achievement-relevant regulation is likely to produce a host of deleterious processes (e.g., threat appraisals, anxiety—both worry and emotionality—task distraction, low self-determination) that invariably lead to an undermining of intrinsic motivation.

The pursuit of performance-approach goals, on the other hand, did not have a negative impact on intrinsic motivation, and although these findings nicely illustrate the fact that performance-approach and mastery goals can have similar effects, we believe that it would be inaccurate to conclude that performance-approach goals always have a beneficial effect on intrinsic motivation. Elliot (1997) argued that individuals may at times adopt performance-approach goals as a means to avoid failure, and under such conditions performance-approach goals are unlikely to facilitate intrinsic motivation. Indeed, correlational research conducted in the college classroom has shown that performance-approach goals have null effects on intrinsic motivation when undergirded by a dispositional avoidance motive such as fear of failure (Elliot & Church, 1997). It is also possible that, when undergirded by an avoidance motive, performance-approach goals may have no immediate negative effect on intrinsic motivation but may undermine individuals' intrinsic interest and enjoyment of achievement activities over the long term. For example, the strategy of defensive pessimism (Norem & Cantor,

1986), which represents an approach form of regulation undergirded by an avoidance motive (Elliot & Church, 1998), has been shown to be detrimental to individuals' interest and enjoyment of achievement pursuits but only after an extended period of time (Cantor, Norem, Niedenthal, Langston, & Brower, 1987).

The results of the confirming versus nonconfirming feedback model provide clear support for Ryan et al.'s (1991) argument that, in the absence of positive feedback, performance goals may produce task persistence—resulting in null effects on behavioral measures of intrinsic motivation relative to mastery goals. Indeed, we found that when performance feedback following task engagement was negative or absent, individuals pursuing performance goals evidenced levels of free-choice persistence equivalent to that of people with mastery goals. However, in contrast to individuals with mastery goals, people pursuing performance goals were likely to persist at the task out of a sense of pressure and urgency rather than continued interest and enjoyment and likely experienced this state as psychologically aversive. Ryan et al. found attenuated correlations between task persistence and self-reported interest for performance-goal participants receiving nonconfirming feedback, suggesting that the behavior of these individuals was not intrinsically motivated.

These findings have methodological implications for researchers using the free-choice paradigm to assess intrinsic motivation. Because different processes are likely to be operating in performance and mastery goal conditions, the free-choice persistence measure should not be considered a valid or reliable indicator of intrinsic motivation in the absence of competence-confirming feedback. Researchers conducting laboratory studies of intrinsic motivation should be attentive to this issue and use the free-choice persistence measure only when their experimental procedures include the provision of positive, competence- confirming feedback. For experiments administering negative or no performance feedback, assessment of intrinsic motivation should be limited to the use of self-report indicators.

The results of the confirming versus nonconfirming feedback model also have theoretical implications for the literature on achievement goals and responses to negative performance feedback. A number of researchers have observed that individuals pursuing mastery goals respond to negative performance feedback with increased effort and persistence, whereas those pursuing performance goals demonstrate a "helpless" pattern of responses following negative feedback, including the withdrawal of effort and decreased persistence at the activity (see Ames, 1992; Mueller & Dweck, 1998). The results of this meta-analysis are somewhat at odds with this prior research, for they suggest that individuals pursuing performance goals may, at least under some conditions, respond to negative performance evaluation with increased effort and task persistence, much like individuals with mastery goals.

How might these seemingly discrepant findings be reconciled? First, it is important to note that, in this sample of studies, task persistence was assessed during a free-choice period in which participants were alone and their performance at the activity was not under evaluation. It is possible that under such private, nonevaluative conditions, individuals pursuing performance goals may persist at the activity in an attempt to demonstrate to themselves that they have the ability to perform well at the task. In more public, evaluative situations, however, individuals with performance goals may withdraw from the task out of social evaluative concerns and demonstrate decreased persistence and other helplessness deficits. A second possibility involves the performance-approach/performance-avoidance distinction. In ancillary analyses (see Footnote 9) we tested the approach–avoidance model within the nonconfirming feedback comparisons and found a significant between-class effect for performance-approach and performance-avoidance goals. After receiving nonconfirming feedback, individuals pursuing performance-approach goals tended to display enhanced free-choice persistence relative to the those with mastery goals. Conversely, those pursuing performance-avoidance goals evidenced decreased task persistence (i.e., an undermining effect) relative to mastery-oriented individuals. These findings suggest that task persistence following negative feedback may be evidenced primarily in persons with performance-approach goals (see Elliot, McGregor, & Gable, 1999). The pursuit of performance-avoidance goals, on the other hand, may result in task withdrawal and decreased persistence in response to negative feedback as well as other helplessness deficits identified in prior research. At present, each of these potential explanations remains speculative and awaits future research attention.

The interplay of performance feedback and approach and avoidance regulation deserves further consideration, for not only may the effects of confirming and nonconfirming feedback vary according to the valence of performance goals (as suggested previously), but the valence of performance feedback may influence the adoption of approach and avoidance performance goals.[10] If the valence of a performance goal has

[10]In considering this issue, it is important to bear in mind the distinction between feedback encountered prior to or during engagement with an evaluative task and feedback encountered on completion of the activity. In the former case, feedback is capable of influencing the person's goals for the activity, whereas, in the latter case, it is not.

not yet been established (via dispositional factors or situational cues that orient the individual toward the possibility of a positive or negative performance outcome), performance feedback received early during task engagement may function to transform an undifferentiated performance orientation into an approach or avoidance performance goal. We incorporated this possibility in developing our coding criteria.

In coding the experiments for moderator variables, we classified studies as inducing performance-avoidance goals when there was an explicit cue in the goal manipulation that would focus participants on the possibility that they might perform poorly at the experimental activity. In the absence of any explicit orienting cue, however, we employed an alternate classification criterion. In this case, we coded performance goals as avoidance whenever participants with an unspecified performance orientation received negative feedback early during task engagement. This second criterion was adopted with the assumption that negative feedback on a practice trial or on early trials of the experimental task would focus participants on the possibility of a poor performance outcome and thereby establish the goal of avoiding such an occurrence. We conducted ancillary analyses comparing performance goals classified as avoidance on the basis of the different coding criteria and found no between-class differences in the magnitude of the undermining effect. The undermining effect was found to hold across both groups of studies. Nonetheless, a question remains concerning the subset of performance goals classified as avoidance on the basis of feedback. Given the limitations of our meta-analytic database, we cannot determine conclusively whether the undermining effect observed for this subset of studies was due to participants adopting an avoidance goal per se. An alternative explanation is that the participants in these studies had an unspecified performance orientation (i.e., they were simply aware that their performance would be normatively evaluated) and that their intrinsic motivation suffered as a direct result of negative evaluation (e.g., through a competence-related process). From this perspective, a performance orientation may leave individuals vulnerable to the effects of failure independent of any detrimental consequences of avoidance regulation. Future research is needed to determine the impact of feedback on undifferentiated performance goals and the precise mechanisms through which negative evaluation produces detrimental effects.

A related question is whether approach and avoidance performance goals, once they have been established, remain stable over time despite fluctuations in the valence of performance feedback. For example, can persons pursuing performance-approach goals retain a positive outcome focus when confronted with negative feedback, or does such feedback automatically lead to a focus on the potential for failure and a corresponding shift to performance-avoidance regulation? We believe the answer to this question depends on several situational and dispositional factors. For example, mild negative feedback or performance setbacks (as found in this sample of laboratory experiments) may be too weak or benign to elicit a change in the regulatory focus of an established performance-approach goal. Unambiguous negative feedback or repeated failure experiences, on the other hand, seem more likely to elicit the transformation from performance-approach to performance-avoidance regulation. In addition, when performance-approach goals are undergirded by fear of failure (Elliot & Church, 1997) or emerge from an entity theory of ability (Dweck, 1990), negative performance feedback may be experienced as shameful or interpreted as indicating an immutable lack of ability and, therefore, may impel a shift to avoidance regulation. On the other hand, when performance-approach goals are undergirded by need for achievement, negative feedback may be interpreted in an informational fashion as a challenge to be overcome, and therefore, the performance-approach orientation may be retained. At present, this issue has yet to receive direct attention in the achievement goal literature and remains an important avenue for future research.

The results of the ego-involvement versus normative model also warrant discussion and suggest directions for future empirical activity. The null findings observed in this meta-analysis suggest that ego-involved and normative performance goals may evoke many of the same psychological processes and have a similar impact on intrinsic motivation. It is important to note, however, that null findings at a between-studies level may reflect between-study variation in other factors that may have obscured true differences between distinct goal states. The possibility remains that a direct comparison between ego-involved and normative performance goals within a carefully designed and executed study might distinguish the two goal states and find them to have different effects on intrinsic motivation. Conceptually, ego involvement entails making global self-evaluation contingent on some external criteria (e.g., a performance outcome). This state is likely to elicit evaluative pressure and anxiety and to reduce the individual's sense of self-determination. These factors, in turn, would likely be detrimental to the person's intrinsic interest and enjoyment of the activity at hand. There is no reason to believe, however, that such processes are necessarily operative when regulating with reference to a normative standard of evaluation. In the absence of ego involvement, normative evaluation may simply provide useful information about one's level of perfor-

mance, skills, or abilities and have little negative effect on intrinsic motivation. Empirically differentiating these conceptually distinct regulatory states remains a challenge for future research.

In addition to the main body of findings discussed previously, we identified a small group of studies demonstrating a strong undermining effect of performance goals that deviated substantially in magnitude from the other experiments (Butler, 1987, 1988; Butler & Nisan, 1986). Because the three studies were conducted by the same principal investigator and were methodologically homogeneous, we regarded these studies as a separate class of outliers and reported the results of the moderator analyses with the studies excluded. Inclusion of the outliers inflated within-class heterogeneity and composite effect sizes but left the general pattern of findings unchanged. However, the question remains as to the factors that could have produced these large effects. The most likely possibility lies in the experimental paradigm used in these investigations. The researchers employed a quasi-experimental design in which classes of students, rather than individuals, were randomly assigned to performance and mastery goal conditions. Because the students participated in the studies within the context of their own classrooms in the presence of their classmates, the environment was considerably more realistic than that of most laboratory experiments and may have elicited stronger reactions to the achievement goal manipulations.

Interestingly, there is a noticeable trend in the achievement goal literature toward the increased use of self-report measures of goals in actual achievement settings, and several researchers have examined the links between self-reported achievement goals and intrinsic motivation in the classroom (Ames & Archer, 1988; Archer, 1994; Duda & Nicholls, 1992; Elliot & Church, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Miller, Behrens, Greene, & Newman, 1993; Nicholls, Pastashnick, & Nolen, 1985). As this literature develops, it will be possible to conduct a companion meta-analytic review to complement this work, although this companion meta-analysis would be limited to self-report measures of intrinsic interest (see Harackiewicz, Barron, Carter, Tauer, & Elliot, in press, however). Juxtaposing the pattern of results obtained via these different methodologies will undoubtably yield additional insights into the relation between achievement goals and intrinsic motivation. At present, the results emerging from the classroom research appear rather similar to those found in the experimental literature, the primary difference being that self-reported performance-approach goals seem to be unrelated rather than positively related to interest and enjoyment in the classroom setting (Elliot & Church, 1997).

In closing, it is important to note that the results of this meta-analysis have clear applied implications. In recent years, a number of theorists have argued for the implementation of classroom and school-wide intervention programs aimed at promoting the adoption of mastery goals and discouraging the adoption of performance goals (Ames, 1992; Anderman, 1997; Maehr & Midgley, 1991; Roeser, Midgley, & Urdan, 1996; Solomon, 1996). Although we wholeheartedly agree that the promotion of mastery goals is an important and worthwhile endeavor, we contend that discouraging all forms of performance goals may be counterproductive. The results of this meta-analysis suggest that some performance goals, namely performance-approach goals, do not undermine intrinsic motivation. Recent research in the college classroom reiterates this point and additionally demonstrates that performance-approach regulation yields some positive achievement outcomes not obtained through the pursuit of mastery goals (see Elliot & Church, 1997; Elliot & McGregor, 1999; Elliot et al., 1999). Furthermore, the eradication of performance goals in educational settings may be a difficult, if not impossible feat. Levine (1983) noted that students tend to adopt a normative mind set and compete with each other even when learning environments are explicitly structured to minimize this type of regulation. Accordingly, it would seem optimal for intervention strategies to have a dual aim—the facilitation of self-improvement/task mastery and the promotion of an approach (as opposed to avoidance) focus with regard to normative comparison. As such, we believe that future investigations should be directed at identifying classroom and school-wide factors that serve as antecedents to performance approach as well as mastery goal adoption. Such efforts would serve the ultimate purpose of conceptual and empirical work in the achievement goal literature, the identification and promotion of adaptive motivational orientations toward achievement-relevant pursuits.

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Appendix. *Studies Included in the Meta-Analysis With Comparison Cells, Coded Moderators, and Effect-Size Estimates*

Study	Comparison Cells	EN/FB/AA	DV	*d*	95% CI
Butler (1987)	Grades versus comments collapsed across ability level	norm/non/avd	SR	–2.37	–2.88 to –1.85
Butler (1988)	Grades versus comments collapsed across ability level	norm/non/avd	SR	–2.27	–3.03 to –1.51
Butler (1992)	Ability versus mastery collapsed across performance, time, and sex	ego/non/app	SR	–0.23	–0.68 to +0.21
Butler & Nisan (1986)	Grades versus comments	norm/non/avd	SR	–1.28	–1.60 to –0.95
Elliot & Harackiewicz (1996) Study 1	Performance-approach versus mastery	norm/conf/app	BH	–0.09	–0.70 to +0.51
			SR	+0.22	–0.39 to +0.82
	Performance-avoidance versus mastery	norm/conf/avd	BH	–0.71	–1.34 to –0.09
			SR	–0.79	–1.42 to –0.16
Elliot & Harackiewicz (1996) Study 2	Performance-approach versus mastery	norm/conf/app	BH	–0.07	–0.58 to +0.43
			SR	0.37	–0.13 to +0.88
	Performance-avoidance versus mastery	norm/conf/avd	BH	–0.67	–1.19 to –0.16
			SR	–0.07	–0.56 to +0.43
Harackiewicz & Elliot (1993) Study 1	Performance versus mastery collapsed across nAch	norm/non/app	BH	0.12	–0.48 to +0.73
			SR	0.94	+0.30 to +1.58
Harackiewicz & Elliot (1993) Study 2	Performance versus mastery collapsed across nAch (positive FB)	norm/conf/app	BH	–0.03	–0.65 to +0.60
			SR	0.40	–0.23 to +1.03
	Performance versus mastery collapsed across nAch (no FB)	norm/non/app	BH	–0.01	–0.61 to +0.58
			SR	–0.35	–0.95 to +0.26
Harackiewicz, Abrahams, & Wageman (1987)	Normative focus versus task focus; excludes reward and control cells	norm/conf/avd	SR	–0.92	–1.72 to –0.13
Harackiewicz, Manderlink, & Sansone (1984) Study 1	Evaluation versus control collapsed across FB type; excludes reward cell	norm/conf/app	BH	–0.41	–0.91 to +0.08
			SR	–0.17	–0.66 to +0.32
Harackiewicz et al. (1984) Study 3	Evaluation versus control in no standard condition; excludes reward and standard cells	norm/conf/app	BH	–0.38	–0.93 to +0.17
			SR	–0.15	–0.69 to +0.40
Koestner & Zuckerman (1994) Study 2	Performance versus learning in success condition	norm/conf/app	BH	–0.27	–0.70 to +0.16
			SR	0.10	–0.32 to +0.53
	Performance versus learning in failure condition	norm/non/app	BH	0.00	–0.43 to +0.44
			SR	0.00	–0.43 to +0.44
Koestner, Zuckerman, & Koestner (1987)	Ego versus task involvement in no praise condition	ego/conf/app	BH	–0.16	–1.04 to +0.72
			SR	–0.20	–1.08 to +0.68
Koestner, Zuckerman, & Koestner (1989)	Ego versus task involvement collapsed across praise	ego/conf/app	BH	0.30	–0.28 to +0.88
			SR	–0.62	–1.21 to +0.03
Koestner, Zuckerman, & Olsen (1990)	Ego versus task involvement collapsed across praise and attributional style	ego/conf/app	BH	0.26	–0.20 to +0.73
			SR	0.11	–0.36 to +0.57
Nichols, Whelan, & Meyers (1991)	Performance versus learning in positive FB condition	norm/conf/avd	SR	–0.60	–1.19 to –0.01
	Performance versus learning in negative FB condition	norm/non/avd	SR	–0.10	–0.68 to +0.47

(Continued)

Appendix. *(Continued)*

Study	Comparison Cells	EN/FB/AA	DV	*d*	95% CI
Plant & Ryan (1985)	Ego versus task involvement in no surveillance condition	ego/conf/avd	BH	–0.15	–0.84 to +0.54
			SR	–0.30	–1.01 to +0.40
Ryan (1982)	Ego versus task involvement collapsed across FB type and FB administration	ego/conf/avd	BH	–0.46	–0.81 to –0.11
			SR	0.05	–0.30 to +0.39
Ryan, Koestner, & Deci (1991) Study 1	Ego versus task involvement; excludes video condition	ego/conf/app	BH	–0.81	–1.53 to –0.09
			SR	–0.89	–1.62 to –0.16
Ryan et al. (1991) Study 2	Ego versus task involvement	ego/non/app	BH	0.45	–0.09 to +0.99
			SR	0.00	–0.53 to +0.53
Ryan et al. (1991) Study 3	Ego versus task involvement in positive FB condition	ego/conf/app	BH	–0.23	–1.05 to +0.59
			SR	–0.45	–1.33 to +0.44
	Ego versus task involvement in no FB condition	ego/non/app	BH	0.84	–0.08 to +1.75
			SR	–0.15	–1.11 to +0.80
Sansone, Sachau, & Weir (1989) Study 1	Positive FB versus no FB in no instruction condition	norm/non/app	BH	0.03	–0.59 to +0.65
			SR	–0.35	–0.98 to +0.27
	Negative FB versus no FB in no instruction condition	norm/non/avd	BH	–0.23	–0.86 to +0.39
			SR	–0.77	–1.41 to –0.13
Tripathi & Nigam (1990)	Ego versus task involvement collapsed across praise	norm/non/avd	BH	–0.40	–0.91 to +0.11

Note: Negative effect sizes indicate lower intrinsic motivation in the performance goal group. A confidence interval (CI) that includes zero indicates a nonsignificant effect. EN = ego-involvement versus normative; FB = feedback; AA = approach versus avoidance; DV = dependent variable; *d* = measure of effect size; norm = normative; non = nonconfirming; avd = avoidance; SR = self-report; ego = ego-involvement; app = approach; conf = confirming; BH = behavioral; nAch = need for achievement.