

# Incremental effects of reward on experienced performance pressure: positive outcomes for intrinsic interest and creativity

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## Summary

Two field studies and a laboratory study examined the influence of reward for high performance on experienced performance pressure, intrinsic interest and creativity. Study 1 found that employees' expected reward for high performance was positively related to performance pressure which, in turn, was positively associated with the employees' interest in their jobs. Study 2 replicated this finding and showed that intrinsic interest, produced by performance pressure, was positively related to supervisors' ratings of creative performance. Study 3 found that college students' receipt of reward for high performance increased their experienced performance pressure which, in turn, was positively related to intrinsic interest and creativity. Copyright © 2008 John Wiley & Sons, Ltd.

## Introduction

Incentive plans are often used in employment settings to encourage superior performance (Bartol & Durham, 2000). While such inducements are found to have positive effects on job performance (Bartol & Locke, 2000; Fay & Thompson, 2001), concerns have been raised over rewards' influence on task interest and creativity. Some researchers maintain that reward reduces the recipient's intrinsic interest and creativity, owing to: (a) a perception that task performance is motivated by the reward to the exclusion of the task itself (the overjustification effect (Lepper, Greene, & Nisbett, 1973), (b) a loss of perceived self-determination over one's own behavior (Deci & Ryan, 1985), or (c) a fixation on obtaining the reward at the expense of exploration of more effective ways to carry out the task (Amabile, 1996). In contrast, others suggest that reward for superior performance increases perceived self-determination, resulting in greater intrinsic interest and creativity (Eisenberger, Pierce, & Cameron, 1999).

The issue of whether reward decreases or increases intrinsic interest and creativity is relevant to organizations because creative contributions help organizations become more efficient, adapt to

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change, and develop new products and services (Mumford, Scott, Gaddis, & Strange, 2002; Shalley, Zhou, & Oldham, 2004). Creative contributions are important for employees whose jobs primarily concern innovation such as research scientists and product designers. Innovation by employees performing jobs that do not directly require creativity also has value for organizations. For example, manufacturing employees have been found to provide effective suggestions to increase productivity and reduce production costs (Carrier, 1998). Employees' enjoyment of their work for its own sake (*intrinsic job interest*) appears to make a significant contribution to their creativity (Shalley et al., 2004).

The controversy concerning the effects of reward on intrinsic interest and creativity overlooks what we believe to be an important feature of employees' reaction to incentives for enhanced performance. Rewards would tend to increase the desirability of achieving the goal upon which the reward is contingent, and so individuals would become more committed to that goal (Locke & Latham, 2002). A strong commitment to the goal in concert with the desirability of the goal would tend to produce a discomforting perception of the necessity for high performance, which we term *performance pressure*. In more specific terms, *performance pressure* refers to an attitude system (Zimbardo & Leippe, 1991) involving a negative evaluative orientation toward performance insufficiency (the attitude proper), a belief that current performance is inadequate for achieving a desired goal, and a negative affective response linked to the attitude and associated belief. This attitude system or mindset would goad individuals toward achieving the performance needed to attain the desired goal. The aversiveness associated with performance pressure would be reduced by finding ways of performing the task better. Of course, the impact of the reward on performance pressure would depend on the perceived attainability of the goal performance. Contingent goals seen to be attainable would produce higher goal commitment and performance pressure while performance-contingent goals that are seen to be out of reach would be disregarded (Locke & Latham, 2002, p. 707). Moreover, while in pursuit of the desired goal, individuals would monitor their progress (Zimmerman & Kitsantas, 1996), and performance pressure would be expected to increase when individuals perceive that their performance lags.

*Hypothesis 1:* Expected reward for high performance is positively related to performance pressure.

The aim of the present studies is to explore the extent to which performance pressure serves as a psychological mechanism through which performance-contingent reward impacts intrinsic interest and ultimately creativity. This analysis differs from contemporary views of intrinsic interest that have often focused on fostering positive emotional or cognitive states, such as the perception of self-determination, as the means for increasing intrinsic task interest (Deci, Koestner, & Ryan, 1999). As will be discussed in more detail below, we suggest that performance pressure goads individuals into making use of higher order skills and concentrating more on the task, leading to greater intrinsic motivation and creativity.

Performance pressure may increase intrinsic interest for two reasons. First, as individuals aim to alleviate the negative experience of performance pressure, they would apply a greater diversity of skills and a greater preponderance of high-level abilities in order to perform their jobs well. They would investigate more thoughtful ways to perform more effectively that depart from routine, making greater use of a broader array of their skills and specialized abilities. Hackman and Oldham's (1976) job characteristics model holds that such skill variety and use of advanced skills would result in increased intrinsic job interest. Skill variety and use of higher order skills have been linked to greater intrinsic job interest and satisfaction (e.g., O'Brien, 1983; O'Brien & Dowling, 1980). Second, the psychological pressure associated with the need to meet high performance requirements would enhance employees' expenditure of energy on the required tasks and absorption in them. According to contemporary theories of work engagement and optimal experience, task concentration is a key element in developing

intrinsic interest (Csikszentmihalyi & Le Fevre, 1989; Eisenberger, Jones, Stinglhamber, Shanock, & Randall, 2005; Gonzalez-Roma, Schaufeli, Bakker, & Lloret, 2006; Sonnentag, 2003).

The identification of intrinsic interest with perceptions of freedom as to whether and how to perform tasks (Deci & Ryan, 1985; Eisenberger, Pierce, et al., 1999) reflects the playfulness often found in enjoyable activities and creativity. However, this view is incomplete in that it fails to consider how incentive-induced psychological pressure often contributes to intrinsic interest and creativity. As an illustration, a technical support employee offered monetary bonuses for increased caller satisfaction would experience high performance pressure. As a result, she would be motivated to introduce additional and higher level skills to satisfy callers. The employee might acquire solutions to a variety of caller problems, develop clearer explanations for what callers must do to solve their problems, and take greater care to soothe disgruntled callers. In addition, the pressure to do well would increase the technical employee's concentration and absorption in these activities. The use of more varied and higher level skills, as well as the enhanced vigor and focus on the tasks, would contribute to intrinsic interest (see Figure 1).

*Hypothesis 2:* Performance pressure is positively related to intrinsic interest.

The feelings of pressure to perform at a high level, resulting from external incentives, might seem to be directly opposed to the previously studied perception of self-determination (Deci & Ryan, 1985). However, we suggest that these two psychological states are discrete and largely independent of one another. Individuals can feel that they are pursuing a course of action based on their own volition as well as experience a compulsion to perform that task to the best of their ability.

There has been considerable disagreement concerning the effects of reward on intrinsic interest and creativity. Perceived self-determination refers to individuals' view that their behavior is self-initiated, self-regulated, and accompanied by feelings of freedom during task performance (Deci & Ryan, 1985; Reeve, Nix, & Ham, 2003). According to cognitive evaluation theory (Deci & Ryan, 1985), individuals view the offer of reward for an enjoyable task as an attempt to control their behavior. This aversive reduction in perceived self-determination is assumed to lessen intrinsic task interest and therefore creative performance. Eisenberger et al. (1999) adopted Deci and Ryan's cognitive evaluation theory but argued that expected reward for a high quality of performance increased, rather than decreased, perceived self-determination and intrinsic interest. Eisenberger et al. suggested that performance-contingent reward, as used in everyday life, is utilitarian, involving the reward giver's lack of control over the potential reward recipient. The potential recipient of performance-contingent reward experiences greater self-determination because of the realization that those offering the reward are required to do so to gain the cooperation of the person being asked to carry out the task. From this view, performance contingent reward would increase intrinsic job interest via both perceived self-determination and performance pressure.

Alternative meta-analyses assert that reward for enjoyable tasks either decreases intrinsic task interest (Deci et al., 1999) or has variable effects depending on the nature of the reward contingency (Cameron & Pierce, 2002; Eisenberger, Pierce, et al., 1999). A clearer pattern of findings emerges with reward for high performance, generally involving an increase in intrinsic interest (e.g., Cameron, Pierce, Banko, & Gear, 2005; Cameron, Pierce, & So, 2004; Eisenberger & Armeli, 1997; Eisenberger, Armeli, & Pretz, 1998; Eisenberger & Rhoades, 2001; Eisenberger & Selbst, 1994; Eisenberger, Rhoades, & Cameron, 1999).

We suggest that employees' perceptions concerning the extent to which their work is self-initiated and engaged in willingly (perceived self-determination) are distinct from the compulsion they experience to perform well on the job (performance pressure). For example, a teacher offered wide latitude in formulating lesson plans and selecting texts would be expected to experience high perceived

self-determination. At the same time, this employee may be seeking to earn an incentive and so experience a high degree of performance pressure. Conversely, if this employee with high autonomy sees herself leaving the organization soon, she may not feel especially pressured to excel on the job. In short, we separate an individual's sense of personal freedom to choose her own actions from her self-imposed drive to perform those actions well.

Because we distinguish the influences of performance-reward expectancy on performance pressure and perceived self-determination, we included perceived self-determination in our model (see Figure 1). Consistent with prior findings concerning the incremental effects of reward for high performance, we predicted that performance-reward expectancy would be positively related to self-determination, which, in turn would be positively related to intrinsic job interest.

*Hypothesis 3:* Expected reward for high performance is positively related to perceived self-determination.

*Hypothesis 4:* Perceived self-determination is positively related to intrinsic job interest.

Performance pressure resulting from expected reward for high performance should lead to increased creativity, as well as intrinsic interest. Intrinsic interest may make an important contribution to creativity. Employees who are strongly interested in their work would be more willing to take risks, consider diverse solutions to problems, and persist in translating initial ideas into workable innovations (Shalley et al., 2004). Rewards specifically for creative performance have been found to increase creativity (e.g., Eisenberger & Armeli, 1997; Eisenberger et al., 1998; Eisenberger & Selbst, 1994; see reviews by Eisenberger & Rhoades, 2003; Stokes, 1999). Further, rewards contingent on a high level of performance generally have been found to increase intrinsic interest and creativity (Eisenberger & Cameron, 1996; Eisenberger & Rhoades, 2001). Consistent with these prior results, we predicted that increased intrinsic interest would be positively associated with creativity (see Figure 1).

*Hypothesis 5:* Intrinsic interest is positively related to creativity.

In summary, we suggest that performance-contingent reward should enhance performance pressure and perceived self-determination, resulting in increased intrinsic interest and, in turn, greater creativity

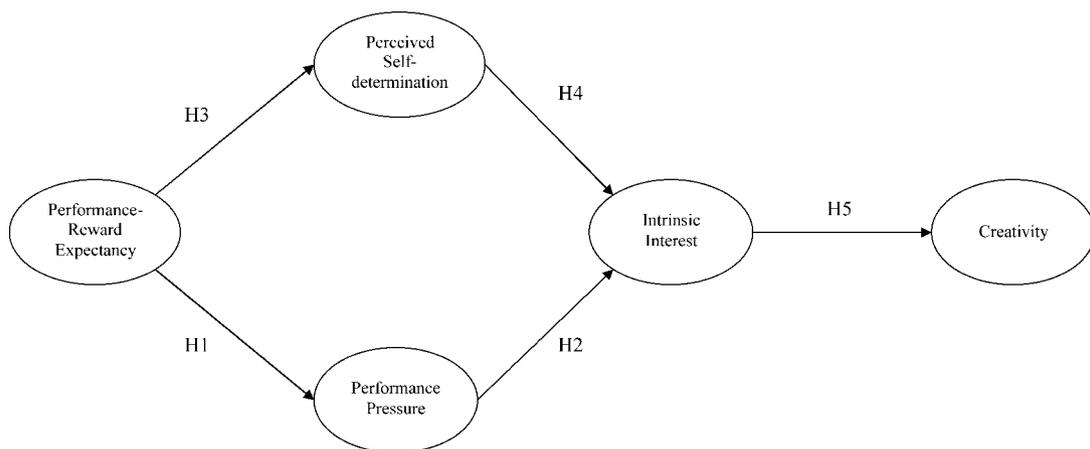


Figure 1. Hypothesized relationships between expected reward for high performance, performance pressure, perceived self-determination, intrinsic interest, and creativity

(see Figure 1). These predictions were tested in three studies. Studies 1 and 2 were field studies conducted with employees in diverse occupations. These employees were asked to report their expectancies concerning the extent to which superior performance would be rewarded by their organization. Such performance-reward expectancy would result from the organization's repeated provision of reward for high performance and from direct promises of reward for high performance (Porter & Lawler, 1968; Eisenberger, Rhoades, & Cameron, 1999) and would result in greater pressure to perform well to obtain organizational rewards. To obtain causal evidence regarding the relationships found in Studies 1 and 2, Study 3 used college students to experimentally assess the influence of performance-based reward on performance pressure, perceived self-determination, and creativity.

## Study 1

Study 1 tested the hypotheses that reward for high performance is positively related to performance pressure and perceived self-determination and that both of these are positively associated with intrinsic interest. Employees from diverse occupations responded to survey questions concerning their expectation of reward for high performance on the job, performance pressure, perceived self-determination, and intrinsic job interest.

### *Method*

#### **Sample and procedure**

Participants were employed alumni of a Mid-Atlantic U.S. university. Names and contact information were obtained from University records. Eight hundred sixteen potential participants were contacted by telephone and asked to participate in the study. Of these, 699 individuals agreed to participate and were mailed a questionnaire, a postage paid return envelope, and a sticker with the University logo. Following Dillman's (2000) suggestions for maximizing return rates, follow-up letters were sent to non-respondents 10 days, 3 weeks, and 6 weeks after the initial mailing. The final mailing included a duplicate questionnaire and a postage paid return envelope. Completed questionnaires were returned by 421 individuals (60.2 per cent).

### *Measures*

Except where otherwise noted, respondents indicated their agreement on a seven-point Likert scale (1, strongly disagree; 7, strongly agree).

#### **Tenure**

Tenure of employees in their organizations was obtained by asking them how long they had worked there.

#### **Performance-reward expectancy**

Participants were asked to express their agreement with the following statements: *If I perform well it leads to higher pay*; *Good performance in my job leads to higher pay*; *If I work hard, it leads to higher*

Table 1. Factor analysis of perceived self-determination and performance pressure items in Study 1

Item	Loading	
	Factor 1	Factor 2
At work, I feel a relaxed sense of personal freedom.	0.78	
On the job, I feel free.	0.78	
At work, I feel I do what I want to do.	0.75	
On the job, I am pursuing goals that are my own.	0.60	
At work, I feel I only do what the organization wants me to do.	0.45	0.33
At work, I feel pressured to do my job well.		0.68
On the job, I feel I have to perform well.		0.57

Note:  $N = 421$ . Factor 1, perceived self-determination. Factor 2, performance pressure. Loadings .2 and lower are omitted from the table.

pay; and *High effort in my job leads to higher pay*. The first two items were previously used by Eisenberger and Rhoades (2001); the two latter items were created for this study.

### Performance pressure

We used the items: At work, I feel pressured to do my job well and on the job I feel I have to perform well. The two items are given in Table 1.

### Perceived self-determination

Perceived self-determination was assessed with five items adapted from Reeve et al. (2003). One other of Reeve's items was eliminated because it assesses experienced pressure but not specifically the pressure to do well and is therefore ambiguously related to both perceived self-determination and performance pressure to do well. Reeve et al. found that these items formed a single factor positively related to intrinsic interest in an educational setting. The wording of the items was modified for use in an organizational setting. The five items are given in Table 1.

### Intrinsic interest

We used four items developed by Eisenberger and Rhoades (2001): *My job is interesting*; *my job is boring*; *my job is unpleasant*; and *my job is enjoyable*. Eisenberger and Rhoades (2001) reported that these items formed a single factor with an acceptable internal reliability (Chronbach's  $\alpha = .78$ ).

## Results

### Exploratory factor analysis

Because performance pressure is a new construct that we wished to differentiate from perceived self-determination, we carried out a principle axis exploratory factor analysis (EFA) with oblique rotation on the items comprising the two scales. EFA provides a conservative test of the distinctiveness of the constructs by allowing the items to load on all factors without constraint. An examination of the scree plot revealed a clear break with two factors having eigenvalues larger than 1.0 and accounting for 40 and 14 per cent of the total variance, respectively. As shown in Table 1, all the items loaded predominantly on their predicted performance pressure and perceived self-determination factors. These results suggest that performance pressure is distinct from perceived self-determination. We therefore retained all items in the final scales.

Table 2. Means, standard deviations, internal reliabilities, and scale intercorrelations for Study 1

Variable	M	SD	1	2	3	4	5
Performance-reward expectancy	3.55	2.02	(.97)	.22**	.19**	.18**	-.13**
Perceived self-determination	4.44	1.28	.26**	(.79)	-.05	.52**	.04
Performance pressure	5.55	1.08	.14*	.06	(.50)	.19**	.03
Intrinsic interest	5.43	1.47	.16**	.50**	.41**	(.87)	.13**
Organizational tenure (in months)	25.12	28.39	-.13*	.01	.06	.15**	(-)

Note:  $N = 421$ . Scale score correlations are given above the diagonal. Latent factor correlations are given below the diagonal. Internal reliabilities (coefficient  $\alpha$ ) are shown in parentheses on the diagonal.

\* $p < .05$ ; \*\* $p < .01$ .

### Descriptive statistics

Scale means, standard deviations, internal reliabilities, and scale intercorrelations are shown in Table 2. Scale scores in the table reflect the mean scores of the scale items. The low and non-significant latent correlation ( $r = .06$ , n.s.) between perceived self-determination and performance pressure is consistent with the factor analytic findings, suggesting their distinctiveness. Consistent with our conceptual model (Figure 1), performance-reward expectancy was positively related to performance pressure, perceived self-determination, and intrinsic job interest. Also, in accord with our model, performance pressure and perceived self-determination were both positively related to intrinsic job interest.

### Measurement model

Prior to testing the hypotheses with structural equation modeling (SEM), we first compared a series of nested measurement models to assess the independence of the constructs under study (Anderson & Gerbing, 1988). The first measurement model estimated was a four-factor model where items related to performance-reward expectancy, performance pressure, perceived self-determination, and intrinsic interest loaded on separate factors. To provide a further test of the independence of performance pressure and perceived self-determination, we included a three-factor model that combined the perceived self-determination and performance pressure items into a single factor, with items related to performance-reward expectancy and intrinsic interest as separate factors. We also included a two-factor model that distinguished the exogenous variable (performance-reward expectancy) from the combination of the endogenous variables (performance pressure, perceived self-determination and intrinsic interest). Last, a one-factor model was specified where all items loaded on a single factor. Chi-square difference tests indicated that the four-factor model fit the data better than the three-factor model ( $\Delta\chi^2(3) = 114.8$ ,  $p < .05$ ), two-factor model ( $\Delta\chi^2(5) = 419.4$ ,  $p < .05$ ), and one-factor model ( $\Delta\chi^2(6) = 2988.4$ ,  $p < .05$ ).

### Structural equation model

To test our hypotheses, SEM with maximum likelihood estimation was used. Individual scale items served as indicators of the latent variables. Tenure served as a predictor of each endogenous variable. The two exogenous variables, performance-reward expectancy and organizational tenure, were free to covary in the analysis.

Figure 2 presents the tested model along with standardized path coefficients and their levels of significance. For ease of presentation, the measurement component of the model and tenure are omitted from the figure. The findings were consistent with the conceptual model: employees' expectation of reward for high performance was positively related to performance pressure (Hypothesis 1) and perceived self-determination (Hypothesis 3), and both of these were positively associated with intrinsic job interest (Hypotheses 2 and 4). Concerning the relationships not depicted in the figure,

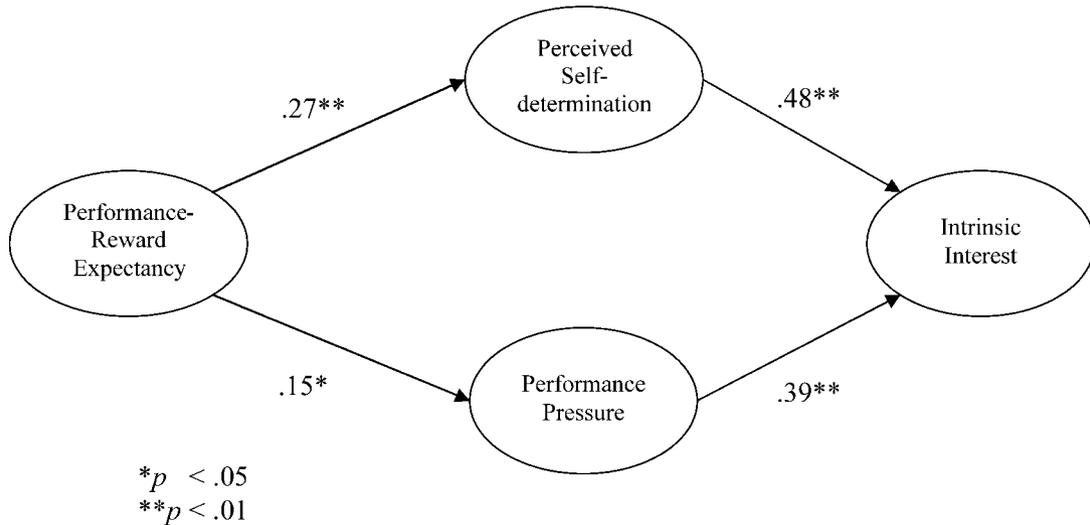


Figure 2. Structural equation model of the relationships between expected reward for high performance, perceived self-determination, performance pressure, and intrinsic interest in Study 1

organizational tenure was significantly related to only one endogenous variable, intrinsic interest ( $\beta = .12$ ,  $p < .01$ ). Fit indices were as follows: ( $\chi^2(97) = 492.1$ ,  $p < .001$ , chi-square/df = 5.1; CFI = 0.91, TLI = .88, RMSEA = 0.10).

Although only one of the fit indices (CFI) reached the conventional acceptable level, modification indices did not suggest any substantive changes that would have produced a better fitting model, and the statistically significant path coefficients were consistent with our hypotheses. Nonetheless, marginal fit of the model from this study is a cause for concern, suggesting the need for replication with other samples involving investigation of omitted variables that might contribute to the observed relationships.

### Tests for mediation

We used Kenny, Kashy, & Bolger's (1998) recommended statistical procedure to assess the mediation of the relationship between performance-reward expectancy and intrinsic interest by performance pressure and perceived self-determination. This involved adding a direct path from performance-reward expectancy to intrinsic interest in the model shown in Figure 1, and calculating the statistical significance of the hypothesized indirect effects using the recommended Sobel test. MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) demonstrated that because the estimate of the indirect effect is not normally distributed, the use of the  $z$  distribution to determine statistical significance, based on the Sobel test, leads to an increased Type 1 error rate. To provide greater statistical power, we used MacKinnon's  $z$ -prime method which corrects the critical value of statistical significance from 1.97 to 0.97.

The added direct path from performance-reward expectancy to intrinsic interest was not statistically significant ( $\beta = -.01$ ,  $p = .88$ ). The Sobel test indicated that performance pressure mediated the relationship between performance-reward expectancy and intrinsic interest ( $z' = 2.11$ ,  $p < .05$ ) and that perceived self-determination mediated the relationship between performance-reward expectancy and intrinsic interest ( $z' = 4.20$ ,  $p < .05$ ).

To assess the direction of causality, Kenny (2007) suggested comparing a specified mediation model with one in which the positions of the mediator and outcome variable are reversed. According to Kenny, if the two models yield similar path strengths, one would have less confidence in the specified model. Therefore, we examined an alternative mediation model in which intrinsic interest led to performance pressure and perceived self-determination which, in turn, led to performance-reward expectancy. In the alternative model, the path from intrinsic interest to performance pressure was not statistically significant ( $\beta = .26, p = .19$ ) while the path from intrinsic interest to perceived self-determination was statistically significant ( $\beta = .51, p < .001$ ). The absence of a statistically significant relationship between intrinsic interest and performance-reward expectancy in the alternative model lends confidence to the specified model.

### *Discussion*

Of particular interest from Study 1 is the finding that expected reward for high performance was positively related to performance pressure and that performance pressure was positively associated with intrinsic job interest. These findings shed light on the processes through which reward for superior performance promotes enhanced intrinsic job interest. We suggest that expected reward for high performance promotes the feeling of compulsion to perform well. This heightened performance pressure would increase intrinsic job interest. The findings from Study 1 also replicate previous findings that reward for high performance promotes increased perceived self-determination and increased intrinsic job interest. These results suggest that offers of reward for superior performance may cause employees to feel more pressured to do well, producing increased job interest.

## **Study 2**

The results of Study 1 suggest that performance-contingent reward increases performance pressure and perceived self-determination, leading to greater intrinsic interest. Intrinsic interest, in turn, would be expected to increase creativity (Shalley et al., 2004; Eisenberger & Rhoades, 2001). Study 2 replicated the first study and extended the findings to examine the relationship between performance pressure and creativity (see Figure 1).

### *Method*

#### **Sample and procedure**

A new group of employed alumni from the university used in the first study served as participants. Data collection procedures for Study 2 mirrored those of the first study, with the addition of supervisor ratings of employee creativity. Supervisor ratings of creativity have been found to be positively related to substantive measures of creativity such as filings for patents (Oldham & Cummings, 1996). Thus, along with the survey materials used in Study 1, participants received a form requesting permission to contact their direct supervisor to obtain a measure of their job performance. Questionnaires assessing employees' creativity at work were mailed to the supervisors of consenting participants.

One thousand three hundred potential participants were contacted by telephone, and 1001 agreed to participate in the study. Of these, 660 (66 per cent) returned a survey, and 264 participants permitted us

to contact their supervisor. One hundred eighty of the 264 (68 per cent) supervisors contacted returned completed evaluations of their subordinate's creativity on the job. Comparisons of participants from whom we did and did not receive supervisor evaluations did not differ reliably on performance-reward expectancy, performance pressure, or tenure ( $t(658) = 0.37, 1.62, \text{ and } 1.86$ , respectively). The participants for whom no evaluation measure was available scored slightly lower on perceived self-determination ( $t(658) = 4.01, p < .01; M_{\text{No Evaluation Group}} = 4.6, M_{\text{Evaluation Group}} = 5.0$ ) and intrinsic job interest ( $t(658) = 4.10, p < .01; M_{\text{No Evaluation Group}} = 5.6, M_{\text{Evaluation Group}} = 6.1$ ).

## Measures

The measures of performance-reward expectancy, performance pressure, perceived self-determination, intrinsic interest, and tenure were the same as in the first study. In addition, supervisors were asked to assess their subordinate's creativity on the job using a six item Likert-type questionnaire (1, agree slightly or not all, 7, very strongly agree). Two of the items were taken from prior studies: *This employee generates creative ideas* (Eisenberger & Rhoades, 2001) and *this employee continues to look for new ways to improve the effectiveness of his/her work* (McNeely & Meglino, 1994). Four additional items were developed for the present study: *This employee develops novel and useful approaches to doing his/her job; this employee handles unforeseen problems with flexibility and innovation; this employee takes a creative approach to solving problems; and this employee generates new and effective solutions to daily work problems.*

## Results

### Descriptive statistics

Scale means, standard deviations, internal reliabilities, and scale intercorrelations are presented in Table 3. In accord with our hypotheses, performance-reward expectancy was positively related to performance pressure (Hypothesis 1) and perceived self-determination (Hypothesis 3), both of which were positively associated with intrinsic interest (Hypotheses 2 and 4). Additionally, intrinsic interest was significantly related to creativity (Hypothesis 5).

### Measurement model

Prior to testing our hypotheses in SEM, we tested a series of nested measurement models to assess the distinctiveness of the constructs (Anderson & Gerbing, 1988). The first model tested was a five-factor model in which performance-reward expectancy, performance pressure, perceived self-determination, intrinsic job interest, and creativity loaded on separate factors. A four-factor model combined

Table 3. Means, standard deviations, internal reliabilities and scale intercorrelations for Study 2

Variable	M	SD	1	2	3	4	5	6
Performance-Reward Expectancy	3.68	2.12	(.97)	.23***	.13*	.19**	.05	-.02
Perceived Self-determination	5.02	1.02	.24***	(.72)	.02	.46***	.19**	-.01
Performance Pressure	5.73	1.01	.13**	.17**	(.56)	.19***	.04	-.01
Intrinsic Interest	6.14	.99	.21**	.54***	.22***	(.85)	.17**	.02
Creativity	5.35	1.24	.07	.22**	.08	.20**	(.94)	.07
Organizational tenure (in months)	51.16	36.89	-.01	-.05	.01	.01	.05	(-)

Note:  $N = 180$ . Scale score correlations are given above the diagonal. Latent factor correlations are given below the diagonal. Internal reliabilities (coefficient  $\alpha$ ) are shown in parentheses on the diagonal.

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$ .

performance pressure and perceived self-determination into a single factor to assess the independence of these constructs among this second sample of employees. In this model items related to performance-reward expectancy, intrinsic interest, and creativity formed separate factors. In order to assess whether employees distinguished intrinsic interest from its antecedents, a three factor model combined performance pressure, perceived self-determination, and intrinsic interest, while including performance-reward expectancy and creativity as separate factors. In order to examine the possibility that the four perceptual factors form a single latent construct, a two-factor model distinguished creativity from the combination of the remaining items. Last, a one-factor model examined the hypothesized distinctiveness of the five constructs. The five-factor model provided superior fit compared to the four-factor model ( $\Delta\chi^2(4) = 42.8, p < .05$ ), three-factor model ( $\Delta\chi^2(7) = 165.8, p < .05$ ), two-factor model ( $\Delta\chi^2(9) = 597.3, p < .05$ ), and one-factor model ( $\Delta\chi^2(10) = 1704.3, p < .05$ ).

### Structural equation model

SEM with maximum likelihood estimation was used to test the hypotheses that performance-reward expectancy is positively related to performance pressure and perceived self-determination, which, in turn were positively related to intrinsic interest and consequently creativity. In the analysis, individual scale items served as indicators of the latent variables. As in Study 1, organizational tenure was specified as a predictor of each endogenous variable in the model.

Standardized path coefficients from the analysis are presented in Figure 3. For clarity of presentation, organizational tenure, and its effects are omitted from the figure. Organizational tenure was not reliably related to any of the endogenous variables. As depicted in Figure 3, all hypothesized relationships were significant. Performance-reward expectancy was positively related to both perceived self-determination and performance pressure. In turn, perceived self-determination and performance pressure were both positively related to employees' intrinsic interest in their jobs, and intrinsic job interest was positively associated with creativity. Fit statistics indicated that the model fit the data well ( $\chi^2(200) = 321.2, p < .05$ ; chi-square/df = 1.61; CFI = 0.96; TLI = 0.95; RMSEA = 0.06).

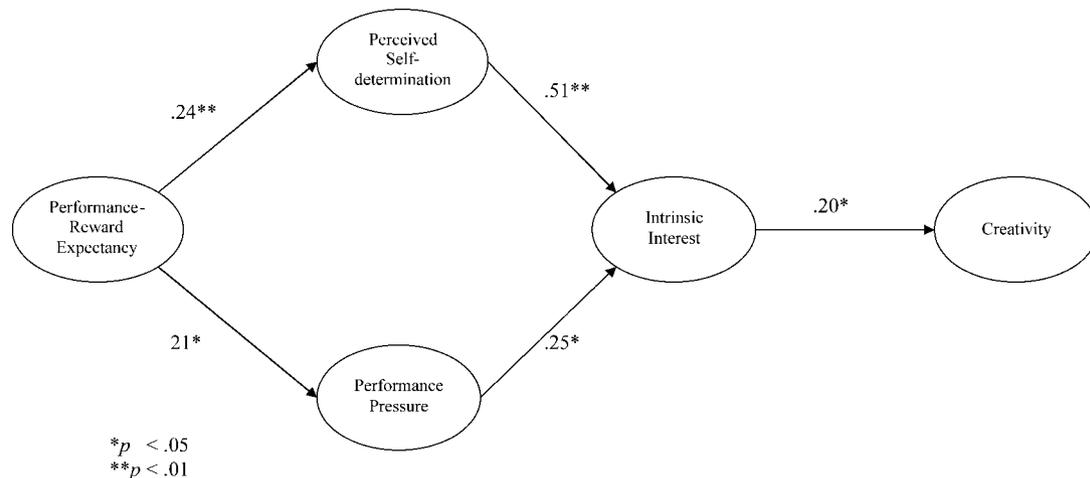


Figure 3. Structural equation model of the relationships between expected reward for high performance, perceived self-determination, performance pressure, intrinsic interest, and creativity in Study 2

### *Tests for mediation*

As in Study 1, tests for mediation were conducted to determine if performance pressure and perceived self-determination mediated the relationship between performance-reward expectancy and intrinsic interest. Thus, the model in Figure 2 was re-estimated with the addition of a direct path from performance-reward expectancy to intrinsic interest. Results from the mediational tests indicated that both performance pressure and perceived-self-determination significantly mediated the relationship between performance-reward expectancy and intrinsic interest, respectively,  $z' = 1.43$ ,  $p < .05$ , and  $z' = 2.35$ ,  $p < .05$ .

To test the hypotheses that intrinsic interest mediated the relationships of performance pressure and perceived self-determination with creativity, two additional models were estimated. The first of these models added a path from performance pressure to creativity. After adding this path, calculation of the Sobel test indicated that intrinsic interest mediated the relationship between performance pressure and creativity ( $z' = 1.51$ ,  $p < .05$ ). The second model added a direct path from perceived self-determination to creativity. This path was not significant ( $\beta = .17$ ,  $p = .11$ ) and model fit was unaffected by the addition of this path ( $\chi^2(199) = 318.5$ ,  $p < .001$ ). After adding this path, calculation of the Sobel test indicated that intrinsic interest mediated the relationship between perceived self-determination and creativity ( $z' = 1.06$ ,  $p < .05$ ).

We examined two alternative models to assess the possibility that the causation was in the direction opposite of that hypothesized in our model. The first model assessed the possibility that intrinsic interest led to performance pressure and perceived self-determination, rather than the reverse. In the first alternative model, intrinsic interest was specified as mediating a relationship of performance-reward expectancy with perceived self-determination and performance pressure, which in turn were specified as predictors of creativity. The paths from intrinsic interest to performance pressure and perceived self-determination were both statistically significant ( $\beta = .25$ ,  $p < .01$ , and  $\beta = .54$ ,  $p < .01$ , respectively). Thus, unlike Study 1, Study 2 afforded less confidence that performance pressure led to intrinsic interest, rather than the reverse.

A second alternative model concerned the possibility that creativity led to intrinsic interest rather than the reverse. In this model, performance-reward expectancy led to performance pressure and perceived self-determination, both of which led to creativity. Creativity, in turn, led to intrinsic interest. The path from creativity to intrinsic interest was not statistically significant ( $\beta = .07$ ,  $p = .36$ ). The alternative model's lack of a significant path from creativity to intrinsic interest provides support for the specified model's assumption that intrinsic interest mediated the relationship between performance-reward expectancy and creativity.

### *Discussion*

The results of Study 2 replicated the findings from Study 1 that performance-reward expectancy was positively related to performance pressure and perceived self-determination, both of which were associated with increased intrinsic job interest. Intrinsic interest, in turn, was found to be positively related to employees' creativity. Thus, when employees were rewarded for high performance, they experienced enhanced perceived self-determination and performance pressure, which, increased intrinsic interest. The resulting intrinsic interest contributed to greater creativity. The results of Studies 1 and 2 suggest that incentives for high performance increase performance pressure leading to greater intrinsic interest and creativity. The results of tests of alternative models in which the directions of causality were reversed were partly supportive of the theoretical model since some of the hypothesized

paths were no longer statistically significant. We next carried out an experimental study to obtain stronger evidence concerning the influence of incentives on performance pressure and its outcomes.

### Study 3

Studies 1 and 2 used a correlational design to assess the relationship between employees' expectations of reward for high performance and performance pressure, perceived self-determination, intrinsic interest, and creativity. The present study employed an experimental design to assess the causal influence of expected reward for high performance on intrinsic interest and creativity through performance pressure and perceived self-determination. Two groups of participants were asked to perform a creative task, with one group offered reward for high performance. Previous experimental research conducted with both school children and college students reported that performance-contingent reward had an incremental effect on perceived self-determination (Eisenberger et al., 1999) and creativity (Eisenberger & Rhoades, 2001). This study expands this research by examining the influence of performance-contingent reward on performance pressure, intrinsic interest, and creativity.

In the present study, participants in the experimental group were given money which they were told they would have to return if they did not perform creatively. The control participants received similar instructions without mention of money. We framed the reward contingency in terms of withdrawal of an incentive for failure to meet the performance criterion because, according to Prospect Theory (Tversky & Kahneman, 1981; Kahneman, Knetsch, & Thaler, 1991), individuals are more highly motivated by potential losses than gains. Thus, in this study, the reward contingency was framed in terms of incentive withdrawal to ensure a high level of performance pressure.

This reward-withdrawal contingency is also of interest for its possible effects on perceived self-determination. Owing to loss aversion, it could be argued that reward-withdrawal would promote a feeling that one is being coerced by the authority figure, thereby undermining perceived self-determination and intrinsic task interest. In contrast, according to Eisenberger et al. (1999), the prospect of withdrawn reward for low performance, as with any performance contingency, should convey the authority figure's lack of control over the target behavior and enhance perceived self-determination and intrinsic task interest. Thus, the third study provided an experimental test of whether a salient performance-based reward contingency would increase performance pressure and perceived self-determination, with consequences for intrinsic task interest and creativity.

### *Method*

#### **Sample**

Four hundred five introductory psychology students participated in this study as part of an introductory psychology course requirement.

#### **Procedure**

Each of 18 experimental sessions was conducted with groups of approximately 20–25 participants. All participants in a given experimental session were assigned to either the reward or control condition, counterbalancing the order of the two conditions across sessions. All participants were told that the experiment involved suggesting ten creative titles for a short story and that the creativity of their titles would be judged against past participants in the study. The short story about popcorn was previously

used by Eisenberger and Rhoades (2001). The text for the popcorn short story (adapted from Seyba, 1984) was as follows:

You are a tiny golden kernel of popcorn lying in the bottom of a frying pan. Look around you and see the other popcorn kernels that are snuggled up close to each other. Feel it heating, getting warmer, hotter, now burning underneath you. Close to you a popcorn kernel explodes. One by one other popcorn kernels pop to life. White clouds appear to be bursting out all around you. The sound of popping drums in your ears. You are cramped, uncomfortable, steaming hot, sweating dizzy. Your whole body feels too tight. You are trapped within a too-tight suit. Suddenly, you, the popcorn kernel, feel yourself exploding, bursting. All at once you are light and fluffy. Bobbing up and down with other popcorn. At last the popping sound begins to quiet. Just an occasional pop, pop, and at last silence.

Participants in the control condition were told the following, “We will be judging the creativity of your titles against the titles of all the other students who have participated in this research in the past. If your titles are judged to be better than 80 per cent of the past participants in this study, you will have done an excellent job.” In the reward condition, the experimenter informed participants that they would start the experiment with ten dollars, and each participant was personally handed a ten-dollar bill. The experimenter then stated, “If your titles are judged to be better than 80 per cent of the past participants in this study, you will have done an excellent job and you will get to keep your ten dollars. However, if your titles are not better than 80 per cent of the past participants in this study, then I will take the ten dollars back from you.”

All participants were given 12 minutes to complete the creativity task. Because time pressure is known to affect creativity (Baer & Oldham, 2006), we did not tell participants that there was a time limit, and we imposed the same time limit on both the rewarded and unrewarded groups. Thus, the rewarded group experienced no more time pressure than the unrewarded group. After completing the questionnaire, the participants were asked to answer a short questionnaire, as described below.

## *Measures*

### **Intrinsic interest**

The four intrinsic interest items used in the Studies 1 and 2 were modified for the present use by replacing the word *job* with *story titling task*. For example, “My job is interesting,” was reworded to read, “The story titling task was interesting.” Participants expressed their agreement with these items and the following measures using a seven point Likert scale (1, strongly disagree, 7, strongly agree).

### **Perceived self-determination**

Perceived self-determination was assessed with three items from Reeve et al.’s (2003) scale that were used in the previous studies.

### **Performance pressure**

The internal reliability of the performance pressure scale used in Studies 1 and 2 was relatively low by conventional standards (Lance, Butts, & Michels, 2006). The effects of attenuation caused by measurement error on calculated reliability becomes greater as the number of scale items decreases (Fan, 2003), and only two items were used to assess performance pressure in the first two studies. To obtain a more general and reliable measure of performance pressure, we *added* the following three items to the prior items: *While creating titles for the short stories, I felt forced to do a first rate job;*

while creating titles for the short stories, I felt driven to do a good job; and while creating titles for the short stories, I felt pushed to perform at a high level.

### Creativity

Following the procedure used by Eisenberger and Rhoades (2001), two undergraduate research assistants independently assigned a creativity score from 1 (not at all creative) to 5 (highly creative) to each title provided by participants. The ten scores assigned to each participant by the two judges were averaged to obtain an overall measure of the participant's creativity. The intraclass correlation coefficient for the judges' creativity ratings was .64.

## Results

### Exploratory factor analysis

A principle axis EFA with oblique rotation was performed on the performance pressure and perceived self-determination items to determine if the expanded performance pressure scale formed a single factor. As was the case in Study 1, we used EFA as a conservative test of the distinctiveness of the constructs since it allows the items to load on all factors without constraint. Two factors with eigenvalues greater than 1.0 were extracted, accounting for 44 and 24 per cent of the variance, respectively. All five items relating to performance pressure loaded at 0.65 or higher on the first factor. The three perceived self-determination items all loaded at 0.58 or higher on the second factor. None of the items was found to have cross-loadings greater than 0.20.

### Descriptive statistics

Scale means, standard deviations, internal reliabilities, and intercorrelations are shown in Table 4. The expanded performance pressure scale achieved a higher level of internal reliability ( $\alpha = .80$ ) than in the first two studies. As predicted, both perceived self-determination and performance pressure were positively related to intrinsic interest. Further, the relationship between intrinsic task interest and creativity approached statistical significance ( $r = .09, p = .08$ ).

### Main effects of reward

Scale scores for each variable were created by averaging items related to each construct assessed. Consistent with Hypotheses 1 and 3, ANOVAs indicated that the reward contingency increased performance pressure and perceived self-determination (see Table 5). The reward contingency also increased intrinsic task interest and creativity.

Table 4. Means, standard deviations, internal reliabilities, and scale intercorrelations for Study 3

Variable	M	SD	1	2	3	4	5
Perceived self-determination	3.92	1.06	(.69)	-.12**	.48***	-.01	.10**
Performance pressure	4.04	1.23	-.09	(.88)	.15***	.08*	.14***
Intrinsic interest	4.31	1.35	.65***	.15***	(.91)	.09*	.19***
Creativity	1.78	.27	-.02	.12**	.09	(-)	.10**
Reward condition <sup>a</sup>	—	—	.11**	.14***	.20***	.10**	(-)

Note.  $N = 405$ . Scale score correlations are given above the diagonal. Latent factor correlations are given below the diagonal. Internal reliabilities (coefficient  $\alpha$ ) are shown in parentheses on the diagonal.

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$ .

<sup>a</sup>Dummy coded such that 1, reward condition and 0, control condition.

Table 5. Mean scores by experimental condition and  $F$ -tests for the dependent variables in Study 3

Dependent variable	Control condition	Reward condition	MS <sub>error</sub>	$F$	Partial $\eta^2$
Perceived self-determination	3.85	4.09	1.37	4.03*	.01
Performance pressure	3.86	4.21	1.49	8.14**	.02
Intrinsic interest	4.06	4.50	1.77	15.38**	.04
Creativity	1.75	1.80	.07	3.88*	.01

Note.  $N=405$ . Significance tests based on an  $F$ -distribution with one degree of freedom between groups and 403 degrees of freedom within groups.

\* $p < .05$ ; \*\* $p < .01$ .

### Measurement model

Prior to examining our hypotheses in SEM, a series of nested measurement models of the latent variables under study were tested to establish the constructs' independence (Anderson & Gerbing, 1988). The models specified were consistent with those tested in Studies 1 and 2. First, a four-factor model was estimated with the performance pressure, perceived self-determination, intrinsic interest items, and the judges' creativity ratings placed on separate factors. To form a three-factor model, we combined performance pressure and perceived self-determination to assess the independence of performance pressure from the established perceived self-determination factor, and maintained intrinsic interest and creativity as separate factors. Next, a model was tested to determine if the three attitudinal outcomes of the reward manipulation were distinct. Thus, a two-factor model was estimated with performance pressure, perceived self-determination, and intrinsic interest comprising one factor, and creativity constituting a separate factor. Last, a one-factor model was specified in which all the items were assigned to the same factor. The four-factor model was found to provide better fit compared to the three-factor model ( $\Delta\chi^2(3) = 242.1, p < .05$ ), two-factor model ( $\Delta\chi^2(6) = 1087.5, p < .05$ ), and one-factor model ( $\Delta\chi^2(7) = 1211.0, p < .05$ ).

### Structural equation model

SEM with maximum likelihood estimation was used to test the hypotheses that performance-contingent rewards increase performance pressure and perceived self-determination, which, in turn increase intrinsic interest and thereby creativity. The reward manipulation variable was dummy-coded (1, the reward condition; 0, the control condition) and specified as an exogenous, observed variable. Each of the other constructs was specified as a latent variable with scale items serving as indicators. Creativity was also specified as a latent variable with the creativity scores assigned by each judge serving as two separate indicators of the factor.

Standardized path coefficients and levels of significance are presented in Figure 4. Reward for high performance had an incremental effect on performance pressure and perceived self-determination. Perceived self-determination and performance pressure, in turn, were positively related to intrinsic interest. The relationship between intrinsic interest and creativity approached statistical significance ( $p = .065$ ). The model provided adequate fit to the data ( $\chi^2(86) = 284.4, p < .001$ ; chi-square/df = 3.3; CFI = 0.93; TLI = 0.90; RMSEA = 0.08).

### Tests for mediation

Mediational tests were performed with procedures paralleling those used in the prior studies. Considering first the mediation of the relationship between reward for high performance and intrinsic interest by performance pressure and perceived self-determination, the requisite added direct path from

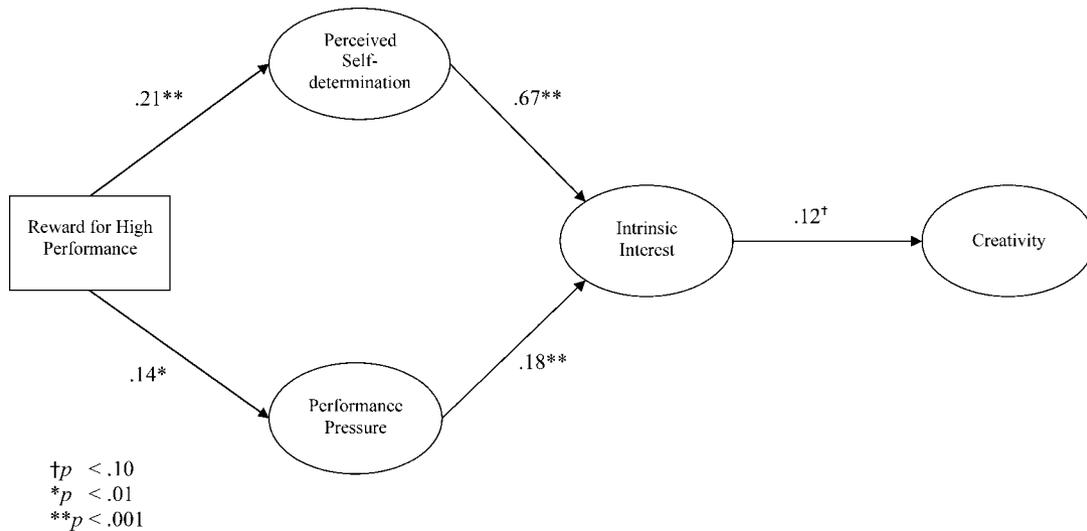


Figure 4. Structural equation model of the relationships between experimentally manipulated reward for high performance, perceived self-determination, performance pressure, intrinsic interest, and creativity in Study 3.

the reward manipulation to intrinsic interest was not significant ( $\beta = .07$ ,  $p = .17$ ). Performance pressure mediated the relationship between reward for performance and intrinsic interest ( $z' = 2.11$ ,  $p < .05$ ), and perceived self-determination mediated the relationship between reward for performance and intrinsic interest ( $z' = 3.26$ ,  $p < .05$ ). Thus, experimentally manipulated reward for high performance had an incremental effect on intrinsic interest through both performance pressure and perceived self-determination. Because the relationship between intrinsic interest and creativity only approached statistical significance, the condition for mediation requiring that the mediator have a significant correlation with the dependent variable was not met (Kenny et al., 1998). As such, we were unable to test whether intrinsic interest mediated the relationship between the reward manipulation and creativity.

To test for reverse causal effects in the mediated model, the positions of perceived self-determination and performance pressure were switched with the position of intrinsic interest. In this model, the reward manipulation influences intrinsic interest which, in turn increases perceived self-determination and performance pressure; these lead to greater creativity. Since intrinsic interest was significantly related to both performance pressure ( $\beta = .12$ ,  $p < .05$ ) and perceived self-determination ( $\beta = .63$ ,  $p < .01$ ), the alternative direction of mediation remains plausible.

## Discussion

Study 3 adds to the correlational evidence of a positive relationship between performance-reward expectancy and performance pressure, as found in the first two studies, by manipulating reward experimentally. Students whose reward depended on high performance experienced greater performance pressure than students asked to meet a performance criterion without reward. Performance pressure mediated the relationship between reward for performance and intrinsic interest. However, the direction of reverse causality between intrinsic interest and performance pressure could not be ruled out because an alternative model containing such reverse paths had comparable fit

statistics. Performance pressure was positively related to creativity, but mediation involving intrinsic interest could not be assessed since the relationship between intrinsic interest and creativity only approached statistical significance. These results, especially the positive relationships of manipulated reward for high performance and performance pressure with intrinsic interest and creativity, support the view that expected reward for high performance influences performance pressure and its consequences. The modeling results were less definitive and suggest the need for replication.

## General discussion

Though our results do not provide definitive evidence that the direction of causality agrees with our hypothesized model, the present series of studies is generally consistent with the view that expected reward for high performance produces the discomfiting perception of the necessity of superior performance, leading to increased intrinsic interest and creativity. Study 1 found that among employees working in diverse occupations, expected reward for high performance was positively related to performance pressure, perceived self-determination, and intrinsic job interest. Study 2 replicated this result and showed positive relationships of employees' performance-reward expectancy and performance pressure with supervisors' ratings of creative performance. Study 3 found that college students' receipt of experimentally manipulated reward for high performance increased performance pressure which, in turn, was positively related to intrinsic interest and creativity.

Mediational analyses provided partial support for our hypotheses. In all the three studies the indirect effect of reward for high performance through performance pressure to intrinsic interest was statistically significant, controlling for the direct effect of reward for high performance on intrinsic interest. Further, in Study 2, the indirect effect of performance pressure through intrinsic interest on creativity was statistically significant, controlling for the direct effect of performance pressure on creativity. However, in Study 3, because the relationship between intrinsic interest and creativity only approached statistical significance, mediation of the indirect effect of performance pressure through intrinsic interest on creativity was not assessed.

Models reversing the direction of performance pressure and intrinsic interest could be rejected in Study 1 but not in Studies 2 and 3. Therefore, as an alternative to the present view that performance pressure leads to intrinsic interest, one might consider the intriguing possibility that employees who become interested and care about their job feel pressure to perform well. The present findings tilt slightly in favor of our hypothesized model because the alternative model with reverse causality did not produce a statistically significant relationship between intrinsic interest and performance pressure in Study 1. Certainly, further tests involving panel designs are warranted to provide better evidence regarding causality. Whether performance pressure leads to intrinsic interest, intrinsic interest leads to performance pressure, or the effects are bidirectional, performance pressure appears to be linked to intrinsic task interest, as heretofore unsuspected.

In our studies, expected reward for high performance showed distinctive positive relationships with performance pressure and perceived self-determination. The latent factor correlations between performance pressure and perceived self-determination in the three studies were .06, .20, and  $-.09$ , respectively, indicating little relationship between the constructs. Moreover, the two psychological states made discrete contributions to intrinsic interest. The distinctiveness of performance pressure and perceived self-determination may seem surprising: feeling pressured to do well would appear to foreclose the perception that one's behavior is self-initiated and engaged in willingly. Yet, there appears

to be a clear psychological distinction between the perceptions of being free or compelled to engage in a behavior and feeling little or much pressure to work toward a goal based on reward.

Although performance pressure and perceived self-determination were distinct, we found in all three studies that reward for high performance was positively related to both of these constructs. Whether assessed in the field studies by expected reward for high performance or manipulated experimentally by a reward contingency, reward for high performance enhanced both perceived performance pressure and self-determination. The present studies suggest that individuals who expect reward for high performance feel a greater compulsion to perform well and a greater sense of control over the initiation of their behavior. The present studies join a growing body of research with children, college students, and employees showing that expected reward for high performance is associated with increased intrinsic interest and creativity (e.g., Cameron et al., 2005; Eisenberger & Rhoades, 2001; Eisenberger et al., 1999).

### *General implications*

Accounts of the pleasurable and freewheeling nature of creative activities have seemed to support contemporary theories emphasizing pleasant mind states as precursors of intrinsic interest and creativity. Nickerson (1999), for example, observed that “there is a great deal of whimsy and play. . . in much of the thinking that scientists do—a considerable amount of toying with ideas and fantasizing—imagining oneself, for example, riding at the head of a beam of light” (p. 410). Consistent with Deci et al. (1999) and Eisenberger et al. (1999), we found that perceptions of self-determination were positively linked to intrinsic interest and creativity. Yet, in the present research we also found that reward for high performance led to a discomforting pressure to perform well, which was also associated with increased intrinsic interest and creativity. Offers of incentives for high performance may make individuals feel freer regarding whether and how to perform the task, as suggested by Eisenberger et al. (1999), but individuals additionally feel more driven to carry the task out. This performance pressure, as well as perceived self-determination, increases intrinsic interest and creativity. The inclusion of performance pressure in our understanding of creativity at work provides a more comprehensive view than prior accounts of employees’ reactions to incentives for improved performance.

The contribution of performance pressure to creative performance found in our studies is consistent with self-regulatory theories of behavior, which emphasize the motivational properties of negative moods (Carver & Scheier, 1990; Klein, 1989). These theories hold that when individuals’ progress toward a goal is less than expected, negative emotionality results, increasing efforts to attain the goal. Providing an incentive for meeting a performance criterion would enhance the aversive emotional reaction to slow progress, producing greater strivings for success (Carver, 2001). In accord with these views, the aversive mind state of performance pressure, produced by a proffered incentive for meeting a high performance standard, would increase intrinsic interest through greater use of diverse and high-level skills (Hackman & Oldham, 1976) and enhanced vigor of performance (Csikszentmihalyi & Le Fevre, 1989; Eisenberger et al., 2005; Gonzalez-Roma et al., 2006; Sonnentag, 2003). Intrinsic interest, in turn, would lead to greater risk taking, consideration of diverse problem solutions, and persistence that converting insights into usable innovations (Shalley et al., 2004). Thus, the discomforting tension of unfulfilled performance, as well as the pleasing perception of self-determination, evidently contributes to intrinsic interest and creativity.

Our findings suggest the benefits of providing employees rewards for high performance. In our studies, expected reward for high performance and the resulting performance pressure were associated with enhanced intrinsic interest and creativity. As employers in many industries increasingly give employees at all ranks enhanced responsibility for directing their own performance and problem

solving (Mumford et al., 2002; Shalley et al., 2004), reward contingencies for high performance can be used to encourage job interest and creativity. As a cautionary note, extremely difficult performance requirements such as “winner-take-all” reward systems may work effectively only for a small number of highly talented or highly motivated employees. For incentive systems to work for the majority of employees, rewards must be realistically attainable. For example, employees can be rewarded based on the degree of increase in performance. Within these limitations, reward for high performance provides a promising method for enhancing employee interest and creativity.

### *Limitations*

The present research has its limitations. First, only two items were used to assess performance pressure in Studies 1 and 2. The inverse relationship between attenuation due to measurement error and number of scale items (Fan, 2003) may have contributed to relatively low internal reliability of the performance pressure scale. When the number of items was expanded in Study 3, a substantially higher level of reliability was obtained.

The present studies examined solely financial reward for high performance as a source of performance pressure. Employees may feel pressured to reach a high performance criterion for reasons other than pay, leading to greater intrinsic interest and creativity. Incentives such as the prospect of supervisor’s personal approval (Raven, 1992) and promotions may be important sources of performance pressure. Threats of job loss may also increase performance pressure as, for example, General Electric’s historical policy of firing the 10 per cent of the workforce receiving the lowest job ratings (Abelson, 2001). Thus, future research should examine a more diverse set of sources of performance pressure in the workplace.

Study 3 had the value of showing an experimentally manipulated relationship between reward and performance pressure. However, the relationship between intrinsic interest and creativity was only marginally significant, precluding a test for mediation. Thus, replication with an experimental design is needed to examine the influence of performance pressure on creativity, as mediated by intrinsic interest.

### *Suggestions for future research*

Future research could extend the findings in various ways. Our experimental study required participants to perform at a high level in order to retain money they had been given. We used the threat of withdrawal of reward because prospect theory (Tversky & Kahneman, 1981; Kahneman et al., 1991) maintains that people are more highly motivated by potential losses than gains and therefore would experience high performance pressure to avoid loss. Future research should address the effects of other kinds of reward contingencies on performance pressure and its consequences.

Dispositional differences might influence the degree of performance pressure induced by offers of reward for high performance. For example, need for achievement (Atkinson, 1974; McClelland, 1961, 1987) has been characterized as an orientation toward “striving to do well, desiring to fully utilize one’s capacities to succeed and to be judged by oneself and others on this success” (Fineman, 1977, p. 2). High need achievers may experience added performance pressure to meet high performance criteria since their self-regard depends on the successful development and utilization of talents and skills. Incentive size may contribute strongly to performance pressure for high need achievers as an indicator of relative merit.

According to goal setting theory (*cf.* Locke & Latham, 2002) offering an incentive for meeting a performance standard increases goal commitment. Owing to the motivation to reach a high

performance standard, goal commitment resulting from the offer of incentives might increase the experience of performance pressure and thereby intrinsic interest and creativity. Consistent with this view, Shalley, Oldham, and Porac (1987) found students' intrinsic task interest was increased by a performance standard that produced high goal commitment.

The present studies provide the first evidence that the subjective experience of performance pressure is positively related to intrinsic interest and creativity. The results are generally consistent with the view that reward for high performance has a positive influence on performance pressure and, as a result, influences intrinsic interest and creativity. These findings suggest a departure from the traditional view that intrinsic interest results from pleasing experiences such as greater self-determination and captivating characteristics of the task itself. Our results suggest that internal pressure to perform well, a discomforting subjective state, is also linked to employees' intrinsic interest and creativity. For example, many scientists and mathematicians such as Einstein, Feynman, and Ramanujan view a sense of incompleteness and urgency as contributing to their creative work when progress is less than anticipated (Clark, 1972; Kanigel, 1991; Macrae, 1992). The present conceptualization of performance pressure and our empirical findings thus supplement contemporary views of intrinsic interest by considering the driven quality of intrinsic interest when goals are perceived to be achievable but require enhanced performance.

## Author biographies

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