Rewarding creativity: when does it really matter?

Markus Baer\textsuperscript{a,}\textsuperscript{*}, Greg R. Oldham\textsuperscript{a}, Anne Cummings\textsuperscript{b}

\textsuperscript{a}Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Wohlers Hall, MC 706, 1206 South Sixth Street, Champaign, IL 61820-6980, USA

\textsuperscript{b}Department of Management, Wharton School, University of Pennsylvania, Philadelphia, PA, USA

Abstract

This study examined the possibility that the relation between extrinsic rewards (e.g., pay and recognition) and employee creativity varied as a function of two conditions: employee job complexity and employee cognitive style. Our results showed a positive relation between extrinsic rewards and creativity for employees with an adaptive cognitive style who worked on relatively simple jobs. We found a weak relation between rewards and creativity for employees with an innovative cognitive style who worked on complex jobs and a negative relation for those in the adaptive style/complex job and innovative style/simple job conditions. We discussed theoretical and practical implications of these findings.

© 2003 Elsevier Inc. All rights reserved.

1. Introduction

Recent research has highlighted the importance of employee creativity in contributing to organizational innovation, effectiveness, and survival (Amabile, 1996; Nonaka, 1991). Consequently, today’s managers face the challenge of creating the conditions necessary for such creativity to flourish (Mumford, Scott, Gaddis, & Strange, 2002). Several scholars have argued that high intrinsic motivation (i.e., the individual is excited about an activity and engages in it for the sake of the activity itself) is a necessary ingredient for creative achievement (Amabile, 1996; Shalley & Oldham, 1997). Moreover, a number of studies have shown that intrinsically motivated individuals are most likely to exhibit high creativity (see Amabile, 1996). Given this perspective and these findings, managers interested in boosting...
creativity should consider implementing practices and procedures designed to enhance employees’ intrinsic motivation levels. For example, managers might provide employees with opportunities to obtain intrinsic rewards by assigning them to jobs that are challenging and stimulating in nature (Hackman & Oldham, 1980; Oldham & Cummings, 1996).

Although the literature suggests that providing employees with intrinsic rewards has the potential to enhance creative performance, many managers continue to emphasize the use of extrinsic rewards (e.g., monetary incentives and recognition) in an effort to stimulate their employees’ creativity (Fairbank & Williams, 2001; Frese, Teng, & Wijnen, 1999; Van Dijk & Van den Ende, 2002). Unfortunately, there is little agreement among scholars concerning the likely direction of the effects of such rewards on creativity (see Amabile, 1996). That is, some authors argue that offering extrinsic rewards for creativity will enhance individuals’ subsequent creative performance (Eisenberger, 1992), while others argue that the use of contingent, extrinsic rewards will actually diminish creativity by undermining individuals’ intrinsic motivation (Amabile, 1996). Moreover, there is empirical research that provides support for both positions—that is, some studies show positive effects of rewards on creativity (Eisenberger, Armeli, & Pretz, 1998; Eisenberger & Rhoades, 2001) and others show negative effects (Amabile, Hennessey, & Grossman, 1986; Kruglanski, Friedman, & Zeevi, 1971). Still, other studies demonstrate that extrinsic rewards have weak or negligible effects on individuals’ creativity (Hennessey, 1989; Joussemet & Koestner, 1999).

Given these contradictory findings, research is needed that explores the specific circumstances under which extrinsic, contingent rewards have positive, neutral, or negative effects on creativity (Eisenberger & Cameron, 1996). The results of such research could help us better understand these earlier inconsistent findings while providing managers with a clear strategy for the optimal use of extrinsic rewards with respect to creativity. Unfortunately, little research of this type has been conducted. The goal of the present investigation is to address this gap in the literature. In the pages to follow, we first define employee creativity and then briefly review the literature that has examined the effects of extrinsic rewards on it. Next, we discuss two conditions—employee job complexity and employee cognitive style—that might affect employees’ responses to contingent, extrinsic rewards. Finally, we report on a study that tests these ideas in a field setting.

1.1. Creativity and extrinsic rewards

We consider employee creativity to be the production of ideas, products, or procedures that are (a) novel or original and (b) potentially useful to the organization (Amabile, 1996; Shalley, 1991; Zhou & George, 2001). These ideas may reflect either a recombination of existing materials or an introduction of new materials to the organization. Further, creative ideas may be generated by employees in any job and at any level of the organization, not just in jobs that are traditionally viewed as demanding creativity (Madjar, Oldham, & Pratt, 2002; Nonaka, 1991).

As noted above, earlier investigations that have examined the effects of extrinsic rewards on creativity have yielded generally mixed results (Eisenberger et al., 1998; Joussemet &
Koestner, 1999; McGraw & McCullers, 1979). For example, Eisenberger and Rhoades (2001) compared the creativity of movie and short-story titles developed by two groups of preadolescent students: a group that was rewarded during a prior training task (generating creative uses for common objects) and a group that was trained but received no monetary rewards. Results indicated that students who received money during the initial training task subsequently developed more creative titles than individuals who received no money. In another study, Eisenberger and Rhoades examined whether the promise of a financial reward would result in more creative short-story titles generated by college students. Results showed that the titles produced by students who were promised money were significantly more creative than the titles of students who were not promised rewards.

Other studies, however, showed that contingent rewards diminished individuals’ creativity. For example, Kruglanski et al. (1971) gave two creativity tasks to Israeli high school students who either had or had not been promised a reward (i.e., a tour of the Tel Aviv University psychology department) for their participation. Results showed that nonrewarded students exhibited higher creativity than rewarded students did. Similarly, Amabile et al. (1986) demonstrated that children and adults who engaged in creative activities to obtain an extrinsic reward (i.e., taking pictures with an instant camera or receiving money) were significantly less creative than those who participated without receiving a reward. Finally, Hennessey (1989) examined the creativity of children completing two computer tasks. Students were assigned to one of three conditions: reward-experimenter (they were awarded a certificate for participation by the experimenter), reward-computer (they received a certificate controlled by the computer), or control (no reward contingency). Results showed no statistically significant differences in creativity between the three conditions.

One explanation for these inconsistent results involves the aforementioned concept of intrinsic motivation. As discussed earlier, many scholars argue that individuals are likely to be most creative when they experience high levels of intrinsic motivation (Amabile, 1996; Oldham & Cummings, 1996; Shalley & Oldham, 1997). Under such conditions, individuals tend to be curious, cognitively flexible, willing to take risks, and persistent in the face of barriers (Deci & Ryan, 1985; Utman, 1997; Zhou, 2003)—characteristics that should facilitate the development of new and potentially useful ideas. Moreover, intrinsically motivated individuals tend to experience positive mood states, such as excitement and enthusiasm (Amabile, Goldfarb, & Brackfield, 1990), which enable them to make more connections among stimuli and to integrate a variety of available resources, again contributing to higher creativity (Isen, 1999).

Earlier empirical work provides support for the connection between intrinsic motivation and creativity. For example, studies by Amabile (1979), Koestner, Ryan, Bernieri, and Holt (1984), and Shin and Zhou (in press) showed positive relations between measures of intrinsic motivation and individuals’ creative responses.

Following this intrinsic motivation perspective, the inconsistent reward-creativity results observed in early studies may be due to the fact that extrinsic rewards boost intrinsic motivation levels in some circumstances, whereas these same rewards diminish intrinsic motivation and creativity in others. What then are the conditions under which extrinsic rewards have these differential effects? One possibility, suggested by the earlier literature
1.2. Extrinsic rewards, job complexity, and creativity

The challenge and complexity of jobs has long been considered an important contributor to employees’ intrinsic motivation and creativity (Amabile, 1996; Boomer & Jalajas, 2002; Hackman & Oldham, 1980). Specifically, complex jobs (i.e., those characterized by high levels of autonomy, skill variety, identity, significance, and feedback) are expected to encourage higher levels of intrinsic motivation and creativity than jobs that are relatively simple and routine in nature. When jobs are complex, individuals are likely to be excited and enthusiastic about their work activities and interested in performing them for the sake of the activities themselves (Oldham & Cummings, 1996)—conditions conducive to creativity at work.

Empirical studies provide some support for these arguments. For example, a metaanalysis of the job design literature concluded that employees working on complex jobs are more satisfied and internally motivated than employees working on jobs that are relatively simple (Fried & Ferris, 1987). With regard to the possible link between job complexity and creativity, Hatcher, Ross, and Collins (1989) demonstrated that a job complexity measure significantly and positively predicted an indicator of creativity—the number of suggestions employees contributed to a formal involvement system.

Given these findings, what might be the role of employee job complexity in explaining the mixed effects of extrinsic rewards on creativity? One possibility is that extrinsic rewards have positive effects on creativity at certain levels of employee job complexity and negative effects at others. According to Cognitive Evaluation Theory (Deci & Ryan, 1985), offering extrinsic rewards to individuals who work on complex jobs that produce high intrinsic motivation should have detrimental effects on their subsequent intrinsic motivation and creativity. In this circumstance, individuals are likely to perceive their behavior as being motivated by the extrinsic reward contingency rather than by the work itself. As a consequence of this shift in perceived locus of causality from intrinsic to extrinsic, employees will begin to view their job as a means to an extrinsic end rather than appreciating its challenging, stimulating qualities. Under such conditions, then, employees should experience their jobs as less enjoyable and involving and should be less apt to engage in the kind of divergent thinking necessary for creativity. Consequently, administering extrinsic rewards to employees occupying complex jobs should cause an undermining of their intrinsic motivation and subsequent creativity (Calder & Staw, 1975; Daniel & Esser, 1980; Deci, Koestner, & Ryan, 1999).

By contrast, offering contingent, extrinsic rewards to employees occupying simple, routine jobs should boost their subsequent creative performance. The activities required by such jobs provide employees with little opportunity to exercise personal control at work (Hackman & Oldham, 1980). Consequently, many individuals in these simple job conditions are likely to seek out alternative ways to exert personal control (Lawler, 2000). Contingent, extrinsic reward systems might provide such an opportunity by giving employees a chance to control the extrinsic rewards they receive for producing creative work (Eisenberger & Rhoades,
By participating in an extrinsic reward program, individuals’ feelings of personal control may be enhanced, thereby boosting levels of intrinsic motivation and creativity. In addition to the possible effects of extrinsic rewards on the experience of personal control, such rewards may have effects on other aspects of employees’ jobs. For example, simple jobs are generally not perceived by employees as significant or important in the greater scheme of things and provide individuals with few opportunities to obtain feedback about their effectiveness (Hackman & Oldham, 1980). It may be that the presence of extrinsic rewards in simple job conditions will suggest to employees that their work is significant and of value to the organization while simultaneously providing tangible information about their performance at work. According to Feedback Intervention Theory (Kluger & DeNisi, 1996), this information should be highly beneficial to employees occupying such jobs. In total, then, we expect extrinsic rewards to enhance the intrinsic motivation and creativity of employees who occupy relatively simple, routine jobs.

Although no research has examined whether the effects of extrinsic rewards on creativity vary as a function of job complexity, a few earlier studies focusing on intrinsic motivation provide indirect support for our arguments (e.g., Deci, 1971; Eisenstein, 1985). For example, Deci (1971) demonstrated that offering individuals contingent monetary rewards for completing a challenging puzzle-solving task decreased their intrinsic motivation relative to individuals who received no rewards for completing the task. Calder and Staw (1975) conducted an experiment in which they manipulated task interest as well as whether or not participants received financial rewards for working on the task. Results showed that financial rewards decreased satisfaction for participants working on the interesting task and increased satisfaction for individuals working on the dull task. McLoyd (1979) demonstrated that extrinsic rewards (e.g., a “Good Reader Award”) increased children’s intrinsic motivation to perform an uninteresting activity. Finally, Loveland and Olley (1979) showed that a “Good Player Award” significantly boosted intrinsic motivation among participants who initially showed little interest in performing an activity.

Thus, based on the arguments and the literature reviewed above, we predict:

**Hypothesis 1:** Job complexity and extrinsic rewards will interact such that employees in complex jobs will exhibit lower creativity and employees in simple jobs will exhibit higher creativity as rewards increase.

1.3. Extrinsic rewards, job complexity, cognitive style, and creativity

Early theory and research has argued that the effects of contextual conditions on employee creativity might vary as a function of stable, individual difference characteristics (see Amabile, 1996; Oldham, 2002). In particular, Amabile (1996) suggests that individuals’ “creativity-relevant skills” (e.g., their cognitive styles) may influence the way they respond to contextual conditions, including extrinsic rewards and the challenge and complexity of jobs. One approach to understanding and measuring individuals’ cognitive styles has been suggested by Kirton (1976, 1994). Specifically, Kirton’s (1994) Adaption-Innovation Theory proposes a bipolar continuum of cognitive styles with adaptors and innovators being located
at opposite ends. According to this perspective, individuals with an adaptive cognitive style (adaptors) tend to operate within given paradigms and procedures without questioning their validity, whereas those with an innovative style (innovators) tend to be willing to take the risk of violating the agreed-upon way of doing things to develop problem solutions that are qualitatively different from previous ones.

In addition to differing in the extent to which they propose creative and frame-breaking ideas (e.g., Keller, 1986; Lowe & Taylor, 1986; Tierney, Farmer, & Graen, 1999), adaptors and innovators also differ in the extent to which they derive excitement and enjoyment from extrinsic rewards (Amabile, Hill, Hennessey, & Tighe, 1994). Specifically, adaptors value being recognized for their efforts and achievements, while innovators describe themselves as depending less on extrinsic reinforcements such as rewards and recognition (Amabile et al., 1994). In addition, employees with an innovative style tend to value complex, challenging activities that stretch their abilities and allow them to gain new experiences, whereas those with an adaptive style prefer work that is relatively routine and straightforward (Amabile et al., 1994; Kirton, 1994).

How then might extrinsic, contingent rewards and creativity be related once we consider both the complexity of employees’ jobs and their cognitive styles? We argued earlier that when employees work on complex, challenging jobs, extrinsic rewards should undermine intrinsic motivation and creativity because they might cause employees to think of their work as instrumental to obtaining the rewards, thereby preventing the playful engagement necessary for creativity. However, when individuals with an innovative style are placed on such jobs, we expect extrinsic rewards to have a much weaker undermining effect on creative responses. Innovators are primarily driven by the challenge and stimulation of the work itself and are likely to find these properties when occupying complex jobs. Consequently, a good “person-job match” should be achieved, resulting in very high levels of intrinsic motivation (Puccio, Talbot, & Joniak, 2000). This is relevant because previous research has demonstrated that when individuals experience extremely high levels of intrinsic motivation, they are basically immune to the detrimental effects of extrinsic rewards (Arnold, 1976; Hennessey, Amabile, & Martinage, 1989; Hennessey & Zbikowski, 1993). Essentially, in such circumstances, individuals are in a state of cognitive stability and have little need to cognitively reevaluate their jobs when offered financial rewards or recognition. Thus, we expect contingent, extrinsic rewards to have weak or negligible effects on the creativity of employees in the innovative style/complex job condition.

In contrast, employees with an adaptive cognitive style prefer work that is routine and predictable and, as a consequence, tend to derive less enjoyment and intrinsic motivation from challenging activities (Amabile et al., 1994; Kirton, 1994). Thus, when adaptors occupy complex jobs, intrinsic motivation levels should not be so high as to immunize them against the undermining effects of contingent, extrinsic incentives. In this circumstance, extrinsic rewards should cause a shift in individuals’ perceived locus of causality from intrinsic to extrinsic, as discussed earlier. Therefore, we expect extrinsic rewards to have generally negative effects on the creativity of employees in the adaptive style/complex job condition.

We predicted that extrinsic rewards would enhance the intrinsic motivation and creativity of employees occupying simple, routine jobs. However, it is also possible that individuals’
cognitive style will influence their responses to the extrinsic rewards offered in these simple job conditions. As noted earlier, one of the primary reasons that contingent, extrinsic rewards are expected to boost creativity in simple job conditions is that the extrinsic reward program provides employees with additional opportunities to exert personal control at work by engaging the reward system itself. However, it may be that individuals with different cognitive styles differ in the extent to which they take advantage of these control opportunities. Specifically, because adaptors value extrinsic incentives (Amabile et al., 1994), it is probable that they are most likely to find these opportunities attractive and to actually exercise this form of personal control at work. Thus, we expect contingent, extrinsic rewards to have positive effects on the creativity of employees in the adaptive style/simple job condition.

In contrast, individuals with an innovative cognitive style tend to value extrinsic rewards and recognition less than those with an adaptive style (Amabile et al., 1994). Therefore, when innovators are placed in simple, routine jobs, they should be less likely to take advantage of opportunities to exert greater control at work by engaging the external reward program. Thus, we expect contingent, extrinsic rewards to have generally weak or negligible effects on the creativity of employees in the innovative style/simple job condition.

On the basis of these arguments, we predict:

**Hypothesis 2:** Job complexity, cognitive style, and extrinsic rewards will interact such that innovators in complex or simple jobs will exhibit no change in creativity, adaptors in complex jobs will exhibit lower creativity, and adaptors in simple jobs will exhibit higher creativity as rewards increase.

### 2. Method

#### 2.1. Research setting, participants, and procedure

This study was conducted as part of a larger research project concerned with employee creativity. Survey data were collected from 171 employees from two manufacturing organizations (118 employees from organization 1 and 53 employees from organization 2). Managers in both organizations identified representative units within each organization suitable for conducting a study investigating the role of individual and contextual conditions on employee responses. All employees in the identified units were invited to participate. The overall response rate was 83% (87% response rate in organization 1 and 75% in organization 2). The sample consisted of employees who held a wide range of jobs in the two organizations (e.g., line operator, technician, tool maker, trainer, design drafter, process engineer, and design engineer). Average age was 41 years, average organizational tenure was 13 years, modal education level was “business college or technical school degree,” and 38% were women.

Employees completed questionnaires assessing job complexity, cognitive style, extrinsic rewards, and demographic characteristics. Respondents were assured of confidentiality when
completing the questionnaire and indicating their names on it. In addition, supervisors of participating employees provided ratings of employees’ creativity.

2.2. Measures

2.2.1. Job complexity
This was measured with items from the Job Diagnostic Survey (Hackman & Oldham, 1980). Three items were used to assess each of the five job dimensions—autonomy, skill variety, task feedback, task identity, and task significance—with respondents indicating on a scale ranging from “very inaccurate” (1) to “very accurate” (7) the extent to which the statements accurately described their jobs. To form an overall complexity index, scores for all 15 items were averaged ($\alpha = .82$). Thus, complex jobs are those that provide job incumbents with independence, opportunity to use a variety of skills, information about their performance, and chance to complete an entire and significant piece of work.

2.2.2. Cognitive style
We used the Kirton Adaption-Innovation Inventory (KAI) (Kirton, 1976) to assess employees’ cognitive style. The KAI is a 32-item instrument on which respondents indicate on a scale ranging from “very hard” (1) to “very easy” (5) how difficult it would be for them to present themselves as a certain type of person. The inventory consists of three subscales—sufficiency of originality, efficiency, and rule/group conformity—with the efficiency and rule/group conformity subscales reverse scored. To derive an overall KAI score, scores for all 32 statements are summed. Adaptors are identified as those receiving low scores on all three subscales; innovators are those receiving high scores.

Over the past 25 years, the KAI has been found to demonstrate acceptable psychometric properties with reliabilities ranging from 0.79 to 0.91 (Brown, 2001). In the present study, Cronbach’s $\alpha$ for the sufficiency of originality, efficiency, and rule/group conformity subscales were .81, .70, and .78, respectively, and .84 for the entire inventory. Items include “A person who would sooner create something new than improve it” (sufficiency of originality), “A person who enjoys detailed work” (efficiency; reverse scored), and “A person who never seeks to bend or break the rules” (rule/group conformity; reverse scored).

2.2.3. Extrinsic rewards
Consistent with previous research investigating the effects of rewards on creativity (George & Zhou, 2002), we used a perceptual measure. Using a scale ranging from “strongly disagree” (1) to “strongly agree” (7), employees responded to the following three items developed for this study: “We have programs in this organization that reward individual creativity”; “This organization rewards people financially for developing unique ideas or products”; and “Individuals in my work unit receive special recognition for unique contributions.” Scores for the three items were averaged to form an index ($\alpha = .77$).

To evaluate the discriminant validity of our independent measures, we conducted maximum likelihood confirmatory factor analysis (CFA). To increase the likelihood of successfully fitting a measurement model, we reduced the number of observable indicators
(see Bentler & Chou, 1987) by using the subscales of the KAI as well as the subscales capturing the five job dimensions. For extrinsic rewards, we used the three individual items as observed indicators of the latent construct. The hypothesized three-factor model was tested against a two-factor and a one-factor model. Model fit was determined by inspecting the overall $\chi^2$ value together with its degrees of freedom and probability value and by considering four subjective fit indices: adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), incremental fit index (IFI), and root mean square error of approximation (RMSEA). Following Browne and Cudeck’s (1993) suggestion, RMSEA values of 0.05 and less were assumed to indicate a good fit between the hypothesized model and the observed data. For the other fit indices, we used the commonly employed cutoff value of 0.90.

We found an acceptable fit for the hypothesized measurement model ($\chi^2_{41} = 56.26, p > .05$, $\text{AGFI} = 0.91$, $\text{CFI} = 0.97$, $\text{IFI} = 0.97$, $\text{RMSEA} = 0.05$) and a rather poor fit for the two-factor ($\chi^2_{43} = 157.03, p < .01$, $\text{AGFI} = 0.76$, $\text{CFI} = 0.74$, $\text{IFI} = 0.75$, $\text{RMSEA} = 0.13$) and the one-factor ($\chi^2_{44} = 264.04, p < .01$, $\text{AGFI} = 0.69$, $\text{CFI} = 0.50$, $\text{IFI} = 0.51$, $\text{RMSEA} = 0.17$) models. We assessed the relative improvement of our hypothesized model over the two alternative models by calculating the difference in $\chi^2$ ($\Delta \chi^2$) between our model and the alternative models. Both differences evaluated using the difference in degrees of freedom ($\Delta df$) were statistically significant ($p < .01$), indicating improvement in model fit and thereby supporting the three-factor structure proposed in this study. Detailed results of these analyses are available upon request.

2.2.4. Creativity

Consistent with previous research (e.g., Madjar et al., 2002; Tierney et al., 1999), we used supervisory ratings to assess employee creativity. Each participant’s direct supervisor rated him or her on the following three items (Oldham & Cummings, 1996): “How original and practical is this person’s work? Original and practical work refers to developing ideas, methods, or products that are both totally unique and especially useful to the organization”; “How adaptive and practical is this person’s work? Adaptive and practical work refers to using existing information or materials to develop ideas, methods, or products that are useful to the organization”; and “How creative is this person’s work? Creativity refers to the extent to which employee develops ideas, methods, or products that are both original and useful to the organization.” We averaged scores for these three items to form a creativity index ($\alpha = .90$).

2.2.5. Control variables

Demographic differences between respondents could have independent effects on creativity and explain the direct and indirect effects observed in this study (Madjar et al., 2002; Shin & Zhou, in press). Thus, we controlled for employees’ education (0 = grade school, 8 = master’s or higher degree), organizational tenure (in years), race (0 = nonwhite, 1 = white), and sex (0 = male, 1 = female) in our analyses. In addition, because some positions may offer employees more opportunities to exhibit creativity (Oldham & Cummings, 1996), we controlled for position (0 = nonprofessional, 1 = professional) in all analyses.
3. Results

Table 1 displays means, standard deviations, and correlations among all variables. An innovative cognitive style was positively related to education ($r=0.27$, $p<0.01$), position ($r=0.20$, $p<0.01$), and creativity ($r=0.24$, $p<0.01$) and negatively related to tenure ($r=-0.22$, $p<0.01$) and sex ($r=-0.28$, $p<0.01$). Job complexity was unrelated to any demographic variable but showed significant correlations with extrinsic rewards ($r=0.32$, $p<0.01$) and creativity ($r=0.22$, $p<0.01$). Sex and extrinsic rewards were positively related ($r=0.16$, $p<0.05$), indicating that women tended to receive higher amounts of extrinsic rewards for exhibiting creativity in the organization. No other significant relation emerged for the extrinsic rewards measure. Finally, education ($r=0.29$, $p<0.01$), tenure ($r=-0.23$, $p<0.01$), position ($r=0.21$, $p<0.05$), and sex ($r=-0.22$, $p<0.01$) all related to creativity.

We predicted that extrinsic rewards would interact with job complexity and cognitive style to affect creativity. To test our hypotheses, we conducted moderated regression analysis entering first the five control variables (education, sex, tenure, position, and race) followed by the three main effect variables (job complexity, cognitive style, and extrinsic rewards), all possible two-way interactions (Cognitive style × Job complexity, Cognitive style × Extrinsic rewards, and Job complexity × Extrinsic rewards), and the three-way interaction (Cognitive style × Job complexity × Extrinsic rewards). Results of this analysis are presented in Table 2.

Hypothesis 1 predicted that as extrinsic rewards increased, employees in complex jobs would exhibit decreased creativity while employees in simple jobs would exhibit increased levels of creativity. Consistent with this hypothesis, results in Table 2 show a significant Job complexity × Extrinsic rewards interaction ($\beta = -7.77$, $p<0.05$). To examine the nature of this interaction, we used procedures described by Aiken and West (1991). Using the unstandardized regression weights and constant from the saturated regression analysis, we plotted the interaction for high and low levels of job complexity and extrinsic rewards. As Fig. 1 shows, the relation between extrinsic rewards and creativity was negative for employees in complex jobs. In contrast, there was a positive relation between extrinsic rewards and creativity for employees in simple jobs. Thus, Hypothesis 1 was supported.

Table 1
Means, standard deviations, and correlations among all variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education</td>
<td>4.59</td>
<td>1.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Organizational tenure</td>
<td>12.74</td>
<td>8.63</td>
<td>-0.50**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Position</td>
<td>0.49</td>
<td>0.50</td>
<td>0.60**</td>
<td>-0.63**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Race</td>
<td>0.77</td>
<td>0.42</td>
<td>0.12</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td>0.16*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Sex</td>
<td>0.38</td>
<td>0.49</td>
<td>-0.57**</td>
<td>0.26**</td>
<td>-0.55**</td>
<td>-0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cognitive style</td>
<td>94.58</td>
<td>13.00</td>
<td>0.27**</td>
<td>-0.22**</td>
<td>0.20**</td>
<td>0.02</td>
<td></td>
<td>-0.28**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Job complexity</td>
<td>5.10</td>
<td>0.81</td>
<td>0.11</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.05</td>
<td>-0.08</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Extrinsic rewards</td>
<td>4.29</td>
<td>1.48</td>
<td>0.04</td>
<td>-0.03</td>
<td>-0.13</td>
<td>-0.13</td>
<td>0.16*</td>
<td>-0.02</td>
<td>0.32**</td>
<td></td>
</tr>
<tr>
<td>9. Creativity</td>
<td>4.60</td>
<td>1.29</td>
<td>0.29**</td>
<td>-0.23**</td>
<td>0.21*</td>
<td>-0.02</td>
<td>-0.22**</td>
<td>0.24**</td>
<td>0.22**</td>
<td>0.08</td>
</tr>
</tbody>
</table>

* $p<0.05$.
** $p<0.01$, two-tailed test.
Table 2 also shows an unexpected significant Cognitive style × Extrinsic rewards interaction ($\beta = -6.63$, $p < .05$). We plotted this interaction following procedures suggested by Aiken and West (1991) and found that innovators exhibited a decrease in creativity as extrinsic rewards increased, whereas adaptors exhibited higher creativity as rewards increased. The plot of this interaction is available on request from the authors.

![Fig. 1. Interaction of job complexity and extrinsic rewards on creativity.](image-url)
Hypothesis 2 predicted that as extrinsic rewards increased, (a) innovators in complex or simple jobs would exhibit no change in creativity, (b) adaptors in complex jobs would exhibit lower creativity, and (c) adaptors in simple jobs would exhibit greater creativity. Consistent with this hypothesis, Table 2 shows a significant Cognitive style × Job complexity × Extrinsic rewards interaction ($\beta = 7.71, p < .05$). An inspection of the interaction plot (Fig. 2) indicates that, as expected, innovators in complex jobs showed no change in creativity as extrinsic rewards increased. Also, as expected, extrinsic rewards were negatively related to creativity for adaptors in complex jobs and positively related to creativity for adaptors in simple jobs. Only the relation between rewards and creativity for innovators in simple job conditions was unexpected—these individuals exhibited a negative response to extrinsic rewards. Thus, Hypothesis 2 received partial support.

4. Discussion

An important question within the creativity literature is whether extrinsic, contingent rewards (e.g., pay and recognition) promote or inhibit individuals’ creative performance. Although much empirical research has addressed this question (see Amabile, 1996; Eisenberger and Rhoades, 2001), results have been largely inconsistent, with studies showing positive, negative, and neutral effects of rewards on creativity (Eisenberger & Rhoades, 2001; Hennessey, 1989; Kruglanski et al., 1971). The purpose of the current study was to address these inconsistent findings by examining the possibility that two conditions suggested by earlier theory and research (Amabile, 1996; Calder & Staw, 1975)—employee job complexity and cognitive style—might moderate the extrinsic reward-creativity relation.

In general, our results suggested that many of the inconsistent results obtained in previous investigations might be a function of the job complexity and cognitive style variables.
Specifically, results showed that contingent, extrinsic rewards were positively related to creativity for employees occupying simple jobs and negatively related for employees holding jobs that were complex and challenging in nature. The effects of job complexity on the extrinsic reward-creativity relation were further modified by employees’ cognitive style. Only employees with an adaptive style who worked on simple jobs benefited from extrinsic rewards. For these individuals, there was a strong, positive relation between extrinsic rewards and creativity. Those with an innovative style in complex jobs were generally unaffected by extrinsic rewards, while those in the adaptive style/complex job or innovative style/simple job conditions exhibited lower creativity as extrinsic rewards increased.

These findings provide substantial support for the notion that the effects of monetary incentives and recognition on creativity are not uniform across different jobs and employees. Moreover, they suggest that neglecting those differences might be one reason previous research has failed to produce consistent and conclusive support for either positive or negative effects of rewards on creativity. As shown in Fig. 2, extrinsic incentives can promote creative performance in the workplace, inhibit it, or not affect it at all depending on the complexity of jobs and employees’ cognitive styles. Hence, rather than focusing on the question of whether extrinsic, contingent incentives positively or negatively affect creativity, we concur with Eisenberger and Cameron (1996) that future research should shift its attention to the conditions that likely interact with rewards to simultaneously determine creativity.

Our finding that adaptors in simple jobs responded most positively to extrinsic rewards is consistent with our argument that individuals with this cognitive style are most likely to take advantage of the opportunity to exert additional personal control at work by engaging the external reward system. Apparently, when adaptors have the opportunity to influence the reward system, their feelings of self-determination are enhanced, which in turn boosts creativity. Consistent with immunization arguments suggested by Hennessey and her colleagues (Hennessey et al., 1989; Hennessey & Zbikowski, 1993), we found no effects of extrinsic rewards for innovators holding complex jobs. Apparently, the innovative style/complex job condition produces a good person-job match, which then results in intrinsic motivation being sufficiently high to immunize employees against the undermining effects of extrinsic, contingent rewards. While the idea that under certain conditions individuals will be immune to the negative effects of rewards is not new (Amabile, 1996; Hennessey et al., 1989), our study is the first to suggest that such immunization might be the result of a match between individuals and their jobs. More research is now needed to examine other conditions under which individuals are immune to the effects of extrinsic rewards.

In further support of Hypothesis 2, our results revealed a negative relation between extrinsic rewards and creativity for employees with an adaptive style who worked on challenging, complex jobs. Because adaptors tend not to appreciate the intrinsic motivational qualities of such jobs to the same extent as innovators, their intrinsic motivation levels are relatively lower under these conditions and, as a consequence, they are more likely to cognitively reevaluate their jobs as being instrumental to obtaining extrinsic incentives when offered such. Although we expected the creativity of adaptors in complex jobs to suffer as extrinsic rewards increased, no such effect was predicted for employees with an innovative style occupying simple, routine jobs. Apparently, relative to adaptors, innovators in simple
jobs are not only less likely to appreciate control opportunities extrinsic to their jobs but also respond to such opportunities with decreased intrinsic motivation and subsequent creativity. One potential explanation for this finding is that innovators in simple jobs view the possibility of exerting control over the extrinsic reward systems as a poor substitute for control opportunities provided by the job itself and therefore experience increased dissatisfaction and frustration with their work. Under such circumstances, creativity is likely to suffer.

In terms of practical implications, our results suggest that when monetary incentives and recognition awards are offered to employees in organizations, a selective approach would be most beneficial. Although managers often use reward and recognition programs in an effort to enhance their employees’ creativity (Fairbank & Williams, 2001; Van Dijk & Van den Ende, 2002), rarely are such programs selective in targeting specific employees in particular jobs. Our results suggest that programs that address employees irrespective of their jobs and cognitive styles will be largely ineffective in stimulating creative contributions, because only employees with an adaptive cognitive style working on simple, routine jobs are likely to exhibit substantially higher creativity when such incentives are offered. In other circumstances, contingent reward programs may either have few benefits (e.g., innovators in complex jobs) or may adversely affect creative responses (e.g., adaptors in complex jobs and innovators in simple jobs). All of this suggests that it would be worthwhile for managers to regularly and systematically assess the cognitive styles and job characteristics of employees and to administer contingent, extrinsic rewards selectively on the basis of these assessments.

Our results also demonstrated that innovators in complex jobs are most creative across all levels of extrinsic rewards and that adaptors in simple jobs, while benefiting from increasing amounts of extrinsic rewards, are not as creative as those occupying complex jobs and possessing innovative cognitive styles (see Fig. 2). These results suggest that while there are benefits to offering money and recognition for creative contributions to adaptors in routine jobs, extrinsic rewards should not be used as a substitute for providing employees the opportunity to engage in challenging activities, especially when they possess an innovative cognitive style. This further highlights the need for managers to acquire in-depth knowledge of their employees and the jobs available to them. Not only will such knowledge allow managers to optimally use extrinsic rewards by offering them selectively to those who are likely to benefit from them (e.g., employees in routine production jobs) but it will also allow them to effectively manage employees’ intrinsic motivation by matching employees with the appropriate job assignments (e.g., assigning innovators to complex jobs). Thus, managing creativity requires two elements: managing intrinsic rewards by matching people and jobs on the one hand and managing extrinsic rewards by selectively offering money and recognition to those who are likely to benefit from them on the other.

Although our study has some clear practical and theoretical implications, it also has some limitations. First, although we have hypothesized causal relations among our variables, and results are generally consistent with predictions, the correlational nature of our study precludes a clear determination of the direction of causality. It is possible that creative employees describe their jobs and cognitive styles differently from employees who are less creative and that this might account for the effects observed in the present study. To rule out
such an alternative explanation, future research should employ experimental procedures to provide additional support for the causal linkages proposed. Second, we have argued that extrinsic rewards affect creativity via effects on intrinsic motivation. However, like many other investigations following an intrinsic motivation perspective (e.g., Oldham & Cummings, 1996; Shalley & Oldham, 1997), we did not measure intrinsic motivation directly, and consequently, it is not clear whether the proposed effects of rewards, job complexity, and cognitive style are actually mediated by this construct. More research is needed that directly assesses intrinsic motivation and determines its mediating effects. In a related manner, previous research has shown that other variables (e.g., locus of causality) may play a role in mediating the effects of external conditions on creativity (Shalley & Perry-Smith, 2001).

Thus, work is needed that contrasts intrinsic motivation with other possible mediators to determine the underlying process responsible for the effects observed in the present study. Finally, we argued that the relation between extrinsic rewards and creativity varied as a function of certain psychological conditions resulting from the interplay between cognitive style and job complexity. For example, we hypothesized that innovators in complex jobs should be immune to the undermining effects of extrinsic rewards due to a good person-job match. However, our study does not allow us to determine the validity of the immunization argument or the other arguments suggested regarding the conditions resulting from matching or mismatching individuals to jobs. Future research is now needed to investigate these issues.

Other potential avenues for future research might include examinations of additional contextual conditions that affect the relation between extrinsic rewards and creativity. For example, feedback and evaluation have been identified as extrinsic constraints that determine the surfacing of employee intrinsic motivation and creativity and might play an important role in determining the effects of extrinsic rewards (Amabile et al., 1990; Zhou, 2003). Also, previous research has distinguished between different reward contingencies and ways in which rewards can be administered (Amabile, 1996; Ryan, Mims, & Koestner, 1983). Thus, it would be interesting to explore whether extrinsic rewards that are noncontingent on creativity elicit results similar to the effects of contingent rewards observed in this investigation.

Acknowledgements

We thank Michael Pratt for his helpful comments on an earlier version of this paper. This paper also benefited from thoughtful comments provided by Michael Mumford.

References


