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The Impact of Performance-Contingent Rewards on Perceived Autonomy and Competence[1]

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Two studies examined the impact of performance-contingent rewards on perceived autonomy, competence, and intrinsic motivation. Autonomy was measured in terms of both decisional and affective reports. The first study revealed an undermining effect of performance-contingent rewards on affective reports of autonomy among university students, and an increase in reports of competence. Decisional autonomy judgements were unaffected by rewards. The second study replicated this pattern of findings among elementary school children. These results help resolve Cognitive Evaluation Theory's (E. L. Deci & R. M. Ryan, 1985; R. M. Ryan, V. Mims, & R. Koestner, 1983) and Eisenberger, Rhoades, et al.'s (R. Eisenberger, L. Rhoades, & J. Cameron, 1999) divergent positions on the impact of performance-contingent rewards on autonomy. The studies also included measures of intrinsic motivation.

KEY WORDS: motivation; rewards; autonomy; competence.

The power of rewards to change and modify behaviors is indisputable. However, whether rewards will have a beneficial long-term motivational impact is questionable. Indeed, a debate persists between social cognitive and behaviorist researchers regarding performance-contingent rewards' impact on intrinsic motivation. That is, there are conflicting views on whether such rewards will encourage spontaneous, interest-driven behaviors in situations where the reward contingencies are no longer salient. As with many debates, one side argues that performance-contingent rewards will have a negative impact whereas the other argues that it

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will have a positive impact. What is unique about this debate, however, is that the two sides have identified exactly the same mediating variable in the reward-intrinsic motivation relationship—namely, perceived autonomy—but have arrived at opposite conclusions regarding the impact of performance-contingent rewards on this critical mediator. Thus, cognitive evaluation theory (Deci & Ryan, 1980, 1985, 2000) argues that performance-contingent rewards will typically undermine intrinsic motivation because they *decrease* feelings of autonomy. By contrast, behaviorist researchers contend that performance-contingent rewards will enhance intrinsic motivation because they *increase* feelings of autonomy (Eisenberger, Pierce, & Cameron, 1999; Eisenberger, Rhoades, & Cameron, 1999). The present article will clarify how this particular debate has taken such an unusual turn.

HOW PERFORMANCE-CONTINGENT REWARDS INCREASE AUTONOMY

A laboratory study done by Eisenberger, Rhoades, et al. (1999) sought to examine the relations of performance-contingent rewards with perceived autonomy and intrinsic motivation. Performance-contingent rewards are defined as those given for performing an activity well, matching a standard of excellence, or surpassing a specific criterion (Ryan, Mims, & Koestner, 1983). Their study revealed that performance-contingent reward enhanced perceived autonomy and both self-reported enjoyment and free-choice persistence. It was also shown that perceived autonomy reliably mediated the effect of reward on enjoyment but was unrelated to free-choice persistence. Perceived autonomy was measured with a single item that assessed perceptions of choice/decision about engaging in the activity ("How much choice did you have as to whether or not carry out the picture task?" Eisenberger, Rhoades, et al., 1999, p. 1029). These findings were interpreted as demonstrating that performance-contingent reward has a strong positive impact on perceived autonomy, and that perceived autonomy is in fact the key mediating variable in promoting intrinsic motivation.

In explaining the findings described above, Eisenberger and colleagues (Eisenberger, Pierce, et al., 1999; Eisenberger, Rhoades, et al., 1999) made the argument that the offer of rewards by an experimenter or a supervisor conveys freedom of action to the potential recipient, not an attempt to control behavior. That is, being in the position of having to offer a reward to someone so that they will perform at a high level is thought to communicate the fact that the rewarder cannot directly control the recipient's behavior. Consequently, the recipient can decide whether or not to accept the reward, thereby demonstrating the recipient's control over his or her environment and consequently boosting feelings of autonomy.

A potential problem with the argument outlined above is that it does not appear to be specific to performance-contingent rewards rather than, say, engagement-contingent rewards (given for simply doing a task; Eisenberger & Cameron,

1996). Thus, offering a reward so that someone will engage a task would seem to communicate that not only is the experimenter unable to control the participant's motivation to perform well but that he or she cannot even control whether the participant will choose to begin the activity. However, Eisenberger and colleagues (Eisenberger, Pierce, et al., 1999; Eisenberger, Rhoades, et al., 1999) argued that engagement-contingent rewards undermined intrinsic motivation. These authors have not specified why autonomy can be increased by some type of rewards—namely, performance-contingent rewards—but not by engagement-contingent rewards.

HOW PERFORMANCE-CONTINGENT REWARDS UNDERMINE AUTONOMY

Cognitive evaluation theory (CET; Deci & Ryan, 1985, 2000) was developed to explain the impact of external events such as tangible rewards, praise, and deadlines on intrinsic motivation and it consisted of three basic propositions (Deci, 1975; Deci & Ryan, 1980, 1985). First, intrinsically motivated behaviors were hypothesized to be based in humans' innate needs for autonomy and competence. Second, social events were expected to influence intrinsic motivation by their impact on perceptions of autonomy and competence. Thus, praise was hypothesized to enhance intrinsic motivation because it communicates competence whereas providing people with choices was expected to enhance intrinsic motivation because it makes people feel autonomous (Deci, 1972; Pittman, Davey, Alafat, Wetherill, & Kramer, 1980; Zuckerman, Porac, Lathin, Smith, & Deci, 1978). Third, the exact motivational impact of an external event such as a reward depends on whether the recipient interprets the event as controlling versus informational. Controlling events are experienced as pressure to act, think or feel in particular ways, and interfere with feeling autonomous. Informational events provide performance feedback in a context of choice and bolster competence without endangering autonomy.

Deci and Ryan (1985) have argued that of all types of reward effects, performance-contingent rewards are the most complex because they have the potential to communicate both competence and control. Engagement-contingent and completion-contingent rewards, by contrast, communicate primarily control and offer little in the way of competence feedback. It is because of the dual nature of performance-contingent rewards (enhancing competence feedback while threatening autonomy) that Ryan et al. (1983) argued that their impact will depend critically on whether the interpersonal context in which they are administered is informational versus controlling. Indeed, these researchers showed that informationally presented performance-contingent rewards enhanced intrinsic motivation relative to a no-reward control group whereas these same rewards undermined intrinsic motivation when they were presented in a controlling manner ("You will receive a $3 reward at the end of today's session if you perform up to our standards").

From the perspective of CET, the significant enhancement effect obtained by Eisenberger, Rhoades, et al. (1999) in their study could be explained if the interpersonal climate of the experiment was informational rather than controlling. CET would hold that performance-contingent rewards can only enhance intrinsic motivation by bolstering feelings of competence. Relatedly, Harackiewicz and colleagues have argued that performance-contingent rewards have symbolic properties related to competence such that individuals care more about doing well when rewards are present and thus especially relish the competence feedback that accompanies earning a performance-contingent reward (Harackiewicz, Manderlink, & Sansone, 1984; Sansone & Harackiewicz, 1998). CET suggests that the impact of performance-contingent rewards on autonomy would tend to be negative because the rewards are pressuring and convey that the individual is expected to perform up to the experimenter's standards. Although this negative effect could be mitigated if the performance-contingent rewards were offered in a noncontrolling way, there are no circumstances under which CET would hypothesize a significantly *positive* impact of rewards on autonomy. That is, although performance-contingent rewards may increase intrinsic motivation, it would be the result of enhanced competence, not autonomy.

A potential problem with the CET view of the effects of performance-contingent rewards on intrinsic motivation is that the critical study which distinguished between informational and controlling rewards, Ryan et al. (1983), failed to find a direct impact of performance-contingent rewards on perceived autonomy, although they did have their predicted effects on intrinsic motivation. A subsequent study of the impact of informational versus controlling forms of competition on intrinsic motivation did find that the negative impact of controlling competition was mediated by feelings of pressure and tension (Reeve & Deci, 1996).

WHY THE DIFFERENT RESULTS?

We believe that the results obtained by Eisenberger, Rhoades, et al. (1999) differ from the usual "CET" findings because of the way in which they operationalized autonomy. Autonomy refers to the extent to which the initiation and regulation of one's actions is determined by personal interests and meaningful values (i.e., by the self) versus being pressured and coerced by external contingencies, or unintegrated aspects of the self such as harsh introjects (Ryan & Deci, 2000). Because CET specifically links the negative impact of rewards to their controlling significance, and because control is defined in terms of pressure to act, think or feel in particular ways, researchers have tended to assess perceived autonomy in terms of the phenomenological experience of pressure–tension versus freedom. However, autonomy can also be assessed in terms of the availability of behavioral options (Iyengar & Lepper, 2000). For example, participants can be asked the extent to which they felt they had a choice about which option to select.

We suggest distinguishing these two ways of measuring perceived autonomy as "affective" and "decisional." Although the two measures of autonomy should be somewhat positively correlated, we would argue that CET was clearly framed in terms of the affective experience of autonomy whereas Eisenberger and colleagues have assessed autonomy in terms of judgements about one's opportunity to decide among behavioral options. Decisional autonomy is expected to be more difficult to report because the individual has to consciously assess whether he or she had the choice to engage in the activity or which strategy to use (e.g., "I believe I had a choice over which strategies to try"). The phenomenological or affective experience of autonomy, by contrast, can be fairly directly assessed by inquiring about the presence of feelings of pressure and tension. A more differentiated evaluation of autonomy may allow us to determine which aspect of autonomy is more affected by performance-contingent rewards, and whether it is positively or negatively. By using both Eisenberger, Rhoades, et al.'s (Eisenberger, Rhoades, et al., 1999) and CET's operationalization of autonomy, we may reach a more differentiated understanding of the impact of performance-contingent rewards on perceived autonomy and hopefully reconcile the two sides of this long-lasting debate.

PRESENT STUDIES

Two laboratory studies tested whether performance-contingent rewards have differential impacts on perceived competence and autonomy. The first study also distinguished between affective and decisional components of autonomy. The two studies also included measures of intrinsic motivation. The first study was modelled after Eisenberger, Rhoades, et al.'s laboratory study with college students (Eisenberger, Rhoades, et al., 1999) but included an assessment of both aspects of autonomy and varied whether the performance-contingent rewards were administered in a controlling or informational manner. The second study was a replication of key findings of the first study, but this time with elementary school children. It was predicted that performance-contingent rewards would enhance feelings of competence and the decisional component of perceived autonomy, whereas it would negatively impact the affective measure of perceived autonomy.

STUDY 1

Eisenberger, Rhoades, et al. (1999, Study 1) recently completed an experimental study with college students which revealed that performance-contingent rewards had a significant incremental effect on perceived autonomy, free time spent performing the task, and expressed task enjoyment. No main effect of performance-contingent reward was found on perceived competence, however.

Study 1 sought to examine the impact of performance-contingent rewards on perceived autonomy, perceived competence, and intrinsic motivation. An affective

and decisional measure of perceived autonomy was used and because previous research has shown that the interpersonal style in which rewards are administered influences their impact (Pittman, Cooper, & Smith, 1977; Ryan et al., 1983), we decided to include this as an independent variable in our design.

We hypothesized that participants in the performance-contingent reward condition would report lower affective autonomy but not decisional autonomy, and higher perceived competence than participants in the no-reward condition. Furthermore, the impact of performance-contingent rewards on intrinsic motivation was expected to depend on whether they were informational or controlling. It is possible that performance-contingent rewards administrated in an informational manner could lead to higher intrinsic motivation but controlling rewards would not (Harackiewicz et al., 1984; Harackiewicz & Manderlink, 1983).

Method

Participants

Participants in this study were 85 undergraduate students who participated for extra-credit. Their mean age was 19.3 years and 80% were women. Participants were randomly assigned to four conditions.

Procedure

All participants did the experiment individually. On reporting to the experiment, participants were told that they would be participating in a perceptual discrimination experiment. Each participant was seated at a table on which a computer and three general interest news magazines (*Time*, *McLean*, and *L'Actualité*) were placed. The computerized task consisted of finding subtle differences between drawings that looked similar. Participants reviewed seven pairs of drawings, and the task was designed so that the number of differences that had to be found increased from one drawing to the next. The task also provided automatic feedback in the sense that when the required number of differences was found (one in the first drawing, two in the second drawing, and so on till the seventh drawing) the participant was automatically advanced to the next drawing. Every participant received positive verbal feedback. The "find-the-error" task was used in previous studies and had been shown to have a high level of intrinsic interest (Eisenberger & Leonard, 1980; Eisenberger & Masterson, 1983; Eisenberger, Masterson, & McDermitt, 1982; Eisenberger, Rhoades, et al., 1999).

When seated in front of the computer, all participants faced a welcome screen and were told: "The task consists of finding subtle differences between drawings that look similar. Every drawing contains up to 10 differences, and the aim of the study is to assess the cognitive processes involved in this perceptual discrimination task. For example, (experimenter started the demo and pointed the computer mouse

on one difference) one difference in this drawing is the finger present in the right picture but not in the left picture, so you would click on it (experimenter clicked on the difference with the computer mouse)." Once the experimenter clicked on the difference, another pair of drawings appeared and the procedure was repeated, but this time two differences needed to be found. Participants were informed that they had a 4-min time limit for each pair of drawings.

Interpersonal Context Induction. All participants received either informational feedback or controlling feedback. These instructions were modelled after those employed by Pittman et al. (1977), Ryan (1982), and Ryan et al. (1983). Specifically, participants in the *informational feedback* condition were told "if you reach the point where you can find six differences, you will have achieved an excellent level of performance. Just do as well as you can."

Participant in the *controlling feedback* condition were told: "If you reach the point where you can find six differences, like you should, you will have performed up to our standard and achieved an excellent level of performance. You should try as hard as possible because I haven't been able to use most of the data I've gotten so far, but if you do well, as you should, I'll be able to use yours."

After the fourth drawing, the experimenter gave participants information on their performance. Participants in the *informational* group were told, "You are doing really well" whereas those in the *controlling* group were told, "You are doing really well, as you should, if you keep it up I will be able to use your data." Once the task was completed, the experimenter acknowledged their good performance. Participants in the *informational* group were told, "You found at least six differences, this is an excellent level of performance" whereas those in the *controlling* group were told, "You found at least six differences, just as you should, this is an excellent level of performance. I'll be able to use your data."

We used an absolute performance standard (e.g., solving a particular number of "find-the-error" problems) instead of a normative performance standard (e.g., surpassing a certain percentage of participants). Although Eisenberger, Rhoades, et al. (1999, Study 1) did not find a main effect of performance-contingent reward on perceived competence, they found a significant interaction between reward and type of performance standard on competence, so that reward increased perceived competence only when an absolute performance standard was used and not when a normative performance standard was employed. We thus decided to focus on the type of performance standard that yielded the most significant results (no other significant interaction concerning performance standard was reported by Eisenberger, Rhoades, et al., 1999).

Reward Induction. Each participant in the performance-contingent-reward condition was informed that he/she would receive $5 if he/she achieved the criteria described above.

Informational performance-contingent-reward participants were told, "We have received some extra money from a grant, so we will be able to pay those who do well on this activity. You will receive a 5$ reward at the end of this session

if you do well on the task." Starting then, after each mention of "excellent level of performance" the experimenter immediately said "for which you will receive a reward of 5$ at the end of this session."

Controlling performance-contingent-reward participants were told, "We have received some extra money from a grant, so we will be able to pay those who do as well as they should on this activity. You will receive a 5$ reward at the end of this session if you perform up to our standard." After each subsequent mention of "excellent level of performance" the experimenter immediately said "for which you will receive a reward of 5$ at the end of this session."

At the end of the task, after the experimenter highlighted their excellent performance, participants in the performance-contingent-reward conditions were told, "You earned your 5$."

The Dependent Measures. After completing the task, the experimenter informed the participants that the experiment was over, and that they needed to fill out a short questionnaire. The experimenter excused herself and stated that she had to make a photocopy of the questionnaire and that she would be back in 5 min. The participant was thus left alone for 5 min with the possibility to complete more "find-the-error" pictures or read the magazines that were left by the experimenter. The behavioral measure of intrinsic motivation consisted of the number of errors participants found (both accurate and inaccurate) during the free-choice period. In essence, this is an indication of the extent to which participants continued to be engaged with the task during the free-choice period. A recent meta-analysis of reward effects found that such a performance measure yielded similar results to the more typical behavioral observation measure (Deci, Koestnter, & Ryan, 1999).

The questionnaire consisted of 21 interspersed items assessing affective and decisional autonomy, perceived competence, and interest. Six items assessed *affective autonomy* (e.g., "During the picture task I felt pressured"). Negative worded items were reverse-scored to assess positive affective experience of autonomy (Koestner, Zuckerman, & Koestner, 1987; Reeve, Nix, & Hamm, 2001; Ryan et al., 1983). Five items assessed *decisional autonomy*, including Eisenberger, Rhoades, et al.'s (Eisenberger, Rhoades, et al., 1999, Study 1) single perceived autonomy item ("How much choice did you have as to whether or not carry out the picture task?").[5] The three items that assessed perceived *competence* included Eisenberger, Rhoades, et al.'s (Eisenberger, Rhoades, et al., 1999, Study 1) item "How poorly or well did you do on the picture task?" as well as another used in previous research (e.g., "I felt incompetent while searching for differences"; Koestner et al., 1987; Ryan et al., 1983). The seven items that assessed *interest* included Eisenberger, Rhoades, et al.'s (Eisenberger, Rhoades, et al., 1999, Study 1) single

[5]It is noteworthy that 23 of the 85 participants (27%) spontaneously asked for clarification from the experimenter regarding the meaning of the item, "how much choice did you have as to whether or not to carry out the picture task?" It seems that the wording of this question was confusing to many participants. This single item was the sole measure of autonomy used by Eisenberger, Rhoades, et al. (1999). No other items on the questionnaire elicited more than a single query from participants.

item "How enjoyable did you find the picture task?" as well as others used in previous research (e.g., "I found searching for the differences interesting"; Koestner et al., 1987; Ryan et al., 1983). Each of these scales was answered on a 7-point Likert scale. All scales had an acceptable level of internal reliability Cronbach alpha ranging from .72 to .91.

Results and Discussion

Preliminary Analyses

A principal component analysis was done on the items assessing autonomy. Two components emerged with Eigen values greater than 1 and accounted for 46.6% of the variance. The extracted components reflected affective autonomy (30.7% of the variance) as well as decisional autonomy (15.8% of the variance). The items and their factor loadings are presented in Table I. One item, "I felt relaxed while searching for differences" loaded on both components (.36 on both components), and was thus eliminated from further analyses. It is noteworthy that Eisenberger, Rhoades, et al.'s autonomy item (Eisenberger, Rhoades, et al., 1999) clearly loaded on the decisional autonomy component . The two components were unrelated to each other ($r = .17$, $p > .10$).

Correlations were calculated among the measures included in the study. Perceived competence was significantly positively related to affective autonomy ($r = .26$, $p < .05$), but was unrelated to decisional autonomy ($r = .14$). Perceived competence and decisional autonomy were significantly correlated with self-reported interest ($r = .32$, $p < .01$; $r = .23$, $p < .05$), but only perceived competence was related to free-choice activity ($r = .28$, $p < .01$). Affective autonomy was

Table I. Factors Loadings for Autonomy Items in Study 1

Items	Factor 1	Factor 2
Affective autonomy		
I felt a relaxed sense of personal freedom	.55	.11
I felt pressure (Reversed)	.85	.01
I felt tense (Reversed)	.77	.02
I felt nervous (Reversed)	.85	.02
I felt anxious (Reversed)	.86	.12
Decisional autonomy		
I felt I was pursuing goals that were my own	.13	.44
I felt I had control to decide how to solve the task	.00	.73
I believe I had a choice over strategies to try	.08	.73
I felt I was doing what the experimenter wanted me to do (Reversed)	−.05	.47
Eisenberger et al.'s item: How much choice did you have as to whether or not to carry out the picture task?	.06	.50

unrelated to self-reported interest ($r = .08$). Neither of the autonomy measures correlated with the behavioral measure of intrinsic motivation ($r's = .04$ and .07). The two measures of intrinsic motivation, self-reported interest and free-choice activity, were significantly positively related ($r = .34$, $p < .01$).

It is important to note that the obtained relation between decisional autonomy and self-reported interest ($r = .23$) was somewhat higher than the correlation of $r = .17$ obtained by Eisenberger, Rhoades, et al. (1999). It is also worth noting that Eisenberger, Rhoades, and colleague similarly obtained a nonsignificant relation between their measure of autonomy and free-choice activity ($r = -.03$). Thus, the relations obtained among outcome measures in the present study closely mirrored those reported by Eisenberger, Rhoades, et al.

Preliminary analyses revealed no two-way or three-way interactions involving gender; it was therefore excluded from the analyses that follow.[6] Preliminary analyses also indicated that the experimental conditions had no effect on actual performance during the performance period. It was therefore not necessary to control for performance when examining the critical dependent variables.

Main Analyses

To examine our central hypothesis, that performance-contingent rewards would decrease affective experience of autonomy but not decisional autonomy, while enhancing perceived competence, a $2 \times 2 \times 3$ ANOVA was performed with Reward (Present/Absent) and Interpersonal Style (Informational/Controlling) as between-subject factors and Type of Need (Affective Autonomy/Decisional Autonomy/Perceived Competence) as a within-subject factor. For this analysis, we used the standardized scores of affective and decisional autonomy and perceived competence. This ANOVA revealed a significant Reward $\times$ Type of Need interaction, $F(1, 83) = 4.89$, $p < .01$. Participants in the performance-contingent reward condition reported relatively lower affective autonomy but relatively higher feelings of competence compared to participants in the control condition. Decisional autonomy did not vary much between conditions. Interpersonal style did not account for any main effect or interaction. Means and standardized scores for the reward and control conditions are reported in Table II.

To more carefully examine the strength of the reward effects on the dependent variables, separate 2×2 ANOVAs were performed with Reward (Present/Absent) and Interpersonal Style (Informational/Controlling) as between-subject factors. A significant main effect of performance-contingent reward on affective autonomy, $F(1, 83) = 4.07$, $p < .05$ was revealed, such that participants rewarded for their good performance reported significantly less affective autonomy ($M = 4.18$) than participants in the no-reward condition ($M = 4.74$). In addition,

[6]Gender had a main effect on perceived competence $F(1, 83) = 4.22$, $p < .05$, such that women reported feeling more competent ($M = 6.02$) than men ($M = 5.61$).

Table II. Means and Standardized Scores by Performance-Contingent Reward Condition for Study 1

Variables	Rewards	No reward
Affective autonomy	4.18 (−0.21)	4.74 (0.22)
Decisional autonomy	5.34 (−0.13)	5.54 (0.13)
Competence	6.08 (0.19)	5.79 (−0.19)
Autonomy	5.86	5.81
Competence	6.33	6.21
Interest	6.00	5.81

Note. Italicised variables are the exact items used by Eisenberger, Rhoades, et al. (1999). Values in parentheses are the standardized scores.

performance-contingent reward had a marginal effect on perceived competence, $F(1, 83) = 3.07$, $p = .08$, such that participants in the performance-contingent reward condition felt somewhat more competent ($M = 6.08$) than participants who were not rewarded for their good performance ($M = 5.79$). Performance-contingent reward had no main effect on decisional autonomy. It should be noted that we also included Eisenberger, Rhoades, et al.'s perceived autonomy, competence, and interest items as separate dependent variables in this same analysis (Eisenberger, Rhoades, et al., 1999), and no effect approached significance (p's $> .26$). In addition, interpersonal styles had no effect on any of the dependent variables.

Separate 2×2 ANOVAs were performed on the two measures of intrinsic motivation with reward and interpersonal style as between-subject factors. No effect approached significance (p's $> .10$). Thus, even if performance-contingent rewards had a detrimental impact on affective autonomy, they had no impact on participants' self-reported interest or free-choice activity.

STUDY 2

This second study aimed to replicate the key findings of Study 1 with elementary school children. Reward strategies are often used in elementary school to promote motivation and the rewards used are typically performance contingent. It might be argued that school children are accustomed to receiving performance-contingent rewards and thus are unlikely to experience as much tension–pressure or other negative consequences when such rewards are offered to them. We thus wished to examine if the same pattern of results for performance-contingent rewards would be obtained for children's reports of affective autonomy and perceived competence. We hypothesized that performance-contingent rewards would decrease reports of affective autonomy while enhancing feelings of competence. We did not include a measure of decisional autonomy for the children because it had not been influenced by rewards in Study 1.

Methods

Participants

Participants were 145 children in the third, fourth, fifth, and sixth grade (65 boys, 80 girls) recruited through the Montreal School Board. Approval was given by school principals and teachers. A letter was sent to parents, explaining the purpose and nature of the study. Parents were asked to return a signed permission slip to their child's teacher. Only children whose parents had agreed to let them participate took part in the experiment.

Procedures

Children were randomly assigned to the performance-contingent reward versus no-reward conditions. Each child was seen individually by the experimenter who escorted them from their classroom to another room, where they were invited to sit at a table. They were introduced to the experimental task, which consisted of exercises from Raven's Standard Progressive Matrices (Raven, 1976). They were given an example of the exercises and were instructed on how to solve it. Children were instructed that they would work with a set of 10 matrices and that they would be given 4 min to complete the set. Children in the performance-contingent reward condition were told that they would get a reward if they performed well. Children in the no-reward condition were simply asked to do the task.

An easy set of matrices was selected so that all children would feel successful. The mean number of correct responses was 8.12 out of 10.

Once the experimenter made sure that the children understood the nature of the task, children were given the set of exercises. All were stopped after 4 min. The experimenter then proceeded to review children's answers. At that point, all children were told, "You did well," regardless of their actual performance. Children in the reward conditions were then given their reward (i.e., a decorative pencil).

The Dependent Measures. Perceived competence, affective autonomy, and interest-enjoyment were assessed with a three-item questionnaire that used 6-point scales. Specifically, children were asked to rate the extent to which they "felt they did well on the task," "felt pressured while doing the task," and "enjoyed the task." The questionnaire was completed at the end of the task; after children in the performance-contingent reward had received their reward.

Results

Preliminary Analyses

Correlations were calculated among the dependent variables. The correlations replicated perfectly our findings in Study 1. Perceived competence was positively

Table III. Means and Standard Deviations by Performance-Contingent Reward Condition for Study 2

Variables	Rewards	No reward
Affective autonomy	4.98 (1.18)	5.36 (0.89)
Enjoyment	4.66 (0.58)	4.31 (0.95)
Competence	4.24 (0.87)	4.09 (0.86)

Note. Values in parentheses are standardized scores.

correlated with affective autonomy and self-reported interest ($r = .23$, $p < .01$; $r = .17$, $p < .05$). Affective autonomy was not related to self-reported interest ($r = .05$, $p > .05$).

Preliminary analyses indicated that the experimental condition had no effect on the children's actual performance on the matrices. It was thus not necessary to control for performance when examining the dependent variables.

Main Analyses

To replicate the critical findings of Study 1, we tested the hypothesis that performance-contingent reward would decrease affective experience of autonomy while enhancing perceived competence. A $2 \times 2 \times 2$ ANOVA was performed with Gender and Reward (Present/Absent) as a between-subject factor and Type of Need (Affective autonomy/Perceived competence) as a within-subject factor. This ANOVA revealed a significant Reward $\times$ Type of Need interaction, $F(1, 141) = 7.23$, $p < .01$. As can be seen in Table III, children in the performance-contingent reward condition reported relatively lower affective autonomy but higher perceived competence. On the other hand, children in the no-reward condition reported relatively higher affective autonomy but diminished perceived competence. This ANOVA also revealed an unexpected and significant gender by rewards interaction, $F(1, 141) = 5.90$, $p < .05$, such that performance-contingent rewards produced a greater negative impact on girls' reports of affective autonomy ($M = 4.74$) than on boys ($M = 5.33$).[7]

To clarify the unique strength of the effect of rewards on autonomy and competence, separate t tests by reward condition were conducted with affective autonomy and perceived competence as the dependent variables. These tests revealed that there was a highly significant effect of reward on affective autonomy, $t(143) = 2.17$, $p < .01$, but that the reward effect for competence failed to approach significance, $t(143) = 1.02$, *ns*.

A 2×2 ANOVA with gender and reward as between-subject factor was performed on children's report of enjoyment. The only significant effect to emerge

[7] Gender had a main effect on perceived competence $F(1, 143) = 3.95$, $p < .05$, such that boys reported feeling more competent ($M = 4.31$) than girls ($M = 4.03$).

was a main effect for reward, $F(1, 141) = 5.98$, $p < .05$, reflecting that children who received a reward reported greater enjoyment than those who did not. No other interactions with gender reach significance.

GENERAL DISCUSSION

The present studies sought to assess the impact of performance-contingent rewards on perceived autonomy, competence, and intrinsic motivation. We differentiated affective autonomy (absence of feelings of pressure and tension) from decisional autonomy (feelings of choice). Our findings suggest that performance-contingent rewards have a negative impact on affective autonomy but not on decisional autonomy. These results point to the importance of distinguishing between affective and decisional autonomy for a more complete and thorough assessment of the influence of performance-contingent rewards. The possible differential impact of such incentives on affective and decisional autonomy adds to the current debate, in that it may explain the opposing points of view of CET and Eisenberger, Rhoades, et al. (1999).

Although we did not replicate Eisenberger, Rhoades, et al.'s finding that performance-contingent rewards have a positive effect on autonomy (Eisenberger, Rhoades, et al., 1999), we found that such rewards are not detrimental to the decisional component of perceived autonomy. This finding somewhat corroborates Eisenberger, Rhoades, et al.'s contention that participants do not interpret such incentives as a form of social control. On the other hand, we substantiated CET's argument that performance contingent can be experienced as controlling and that they are detrimental to affective autonomy, that is, such incentives created feelings of pressure to do the task and anxiety about one's performance. Thus, even if participants did not explicitly experience performance-contingent rewards as limiting their capacity to decide on behavioral options, they still felt anxious and pressured to do the task. It may be that the sentiments of anxiety and pressure are easier to measure because they are more phenomenologically accessible than the degree to which a behavior is personally chosen.

Some support was found for CET's contention that performance-contingent rewards increase perceived competence relative to their effect on (affective) autonomy. It is logical that receiving a reward for an excellent performance will enhance our feelings of competence. In this sense, the reward rightfully acts as a competence cue (Harackiewicz et al., 1984; Sansone & Harackiewicz, 1998). However, the feeling of competence did not safeguard against the sentiments of anxiety and tension. Participants in the reward condition tended to experience higher levels of competence that were accompanied by high levels of anxiety and pressure, compared to participants in the control condition.

One of the major issues of the present studies concerns the definition and operationalization of autonomy. What is autonomy? According to self-determination

theory (Deci & Ryan, 2000) autonomy "refers to volition—the organismic desire to self-organize experience and behavior and to have activity be concordant with one's integrated sense of self" (p. 231). Autonomy does not refer to individualism, independence, or control, which are concepts more easily assessed. Indeed, measuring autonomy is not easy. Since the concept of autonomy is not as easy to report on as, say, level of self-esteem, experiential markers of autonomy are used instead. When the need for autonomy is fulfilled (by providing an autonomy supportive environment), people report the absence of feelings of anxiety and pressure and a sense of having personally chosen the activity they are engaging in. We would suggest that individuals are more in touch with their feelings of pressure–tension versus freedom and that these markers provide a clear test of CET's predictions regarding the potential controlling impact of rewards. We suspect that asking participants "how much choice did you have as to whether to carry out the experimental task," as Eisenberger, Rhoades, et al. (1999) did, left participants confused because the experimenter did not specify that there were any behavioral options and the act of agreeing to participate in an experiment necessarily implies that one has chosen to do the experimental activity.

Many self-determination researchers measure autonomy in terms of perceived locus of causality, as reflected in the relative endorsement of intrinsic, identified, introjected, and external reasons for engaging in a given behaviour (Deci & Ryan, 2000). It would have been useful to include such measures in the present study, especially given that neither of our measures of autonomy was found to directly mediate the effects of rewards on intrinsic motivation. Ideally, our study would have shown not only that performance-contingent rewards undermine feelings of autonomy, but also that this undermining translates into reduced levels of intrinsically motivated behaviors.

It is important to note that we did not find a significant effect for controlling versus informational experimenter style in Study 1. An informational or controlling interpersonal style did not diminish or enhance the impact of rewards on anxiety and pressure as we were expecting. This null finding stands in contrast to previous studies that have obtained significant negative effects for rewards and praise with controlling experimenter style (see Deci et al., 1999, for a review). A possible interpretation of this is that our paradigm, based on Eisenberger, Rhoades, et al. (1999), might be globally more controlling than Ryan et al.'s paradigm (Ryan et al., 1983). The experimenter in our study was perhaps more directly imposing even in our "informational" condition. Indeed, even if the experimenter did not use a controlling vocabulary (e.g., should, have to, etc.), the instructions contained "if . . . then" contingencies ("if you reach the point where you can find six differences, you will have achieved an excellent level of performance") that can be perceived as controlling. In the self-esteem literature (Baldwin & Sinclair, 1996) such contingencies can foster negative feelings in certain individuals.

A second point that must be acknowledge is that performance-contingent rewards did not undermine intrinsic motivation in Study 1, and actually enhanced

reports of enjoyment in Study 2. Recent meta-analyses of the reward literature have yielded confusing results for performance-contingent rewards compared to the results for other types of rewards. Thus, Eisenberger and Cameron (1996) concluded that performance-contingent rewards significantly enhanced intrinsic motivation on self-report measures but not on behavioral measures. Deci et al. (1999), by contrast, concluded that performance-contingent rewards significantly undermined intrinsic motivation when measured behaviorally but had no effect on self-reports. These latter authors also noted that the impact of performance-contingent rewards was difficult to assess because researchers had used widely varying control conditions and different performance standards across studies.

A possible explanation for the enjoyment-enhancing effect in Study 2 is that rewards may have heightened the competence value (Harackiewicz et al., 1984; Sansone & Harackiewicz, 1998). Because the second study used an easy task at which all participants excelled, it may be that the rewards heightened the value of competence and then children experienced greater enjoyment when they performed well. In Study 2, children who received a performance-contingent reward did feel more competent than children in the no-reward condition. This hypothesis is in line with CET's proposition that the only way performance-contingent rewards can increase intrinsic motivation is by enhancing perceived competence.

CONCLUSION

The present studies examined the impact of performance-contingent rewards on perceived autonomy, competence, and intrinsic motivation. For the first time, autonomy was measured in terms of both decisional and affective reports. Decisional autonomy refers to feeling of choice, whereas affective autonomy refers to an absence of feelings of pressure and tension. Results revealed that performance-contingent rewards undermined affective autonomy, but decisional autonomy judgements was unaffected by rewards. In addition, results suggest that performance-contingent rewards have a positive effect on feelings of competence. We believe that this new conceptualization of autonomy and this set of findings help resolve CET's (Deci & Ryan, 1985; Ryan et al., 1983) and Eisenberger, Rhoades, et al.'s (Eisenberger, Rhoades, et al., 1999) divergent views on the impact of performance-contingent rewards on autonomy.

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