

Introducing Uninteresting Tasks to Children: A Comparison of the Effects of Rewards and Autonomy Support

Mireille Joussemet

Richard Koestner

Natasha Lokes

Nathalie Houlfort

McGill University

ABSTRACT Two experiments compared rewards and autonomy support as methods to promote children's self-regulation for an uninteresting vigilance task. Dependent measures were ratings of positive affect, perception of the task's value, and free-choice engagement. ANOVA results revealed some positive effects associated with autonomy support, whereas no effect for rewards was found in either study. The outcomes of most interest were correlations between free-choice behavior and self-reported measures of affect and value, reflecting the level of integration in self-regulation. As predicted by self-determination theory (Deci & Ryan, 1985, 1991, 2000), rewards were associated with behaviors incongruent from affect and value, whereas autonomy support led to integrated self-regulation. This finding was first detected in Study 1 and later replicated in Study 2. Together, these results point to autonomy support as a beneficial alternative to the common use of rewards.

Mireille Joussemet, McGill University; Richard Koestner, McGill University; Natasha Lokes; Nathalie Houlfort, McGill University.

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Correspondence concerning this article may be addressed to Richard Koestner, Department of Psychology, McGill University, Montréal (Québec), Canada, H3A 1B1. Electronic mail may be sent to koestner@hebb.psych.mcgill.ca.

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Teaching children valued behaviors is a central task for parents and teachers. In order to face this daily challenge, adults frequently rely on extrinsic rewards. This strategy has been questioned, however, by researchers who fear there are hidden costs to enlisting compliance in this way. For example, researchers have found that rewards undermine children's natural interest in activities and also interfere with the cultivation of their ability to value uninteresting but important activities (Lepper, Greene, & Nisbett, 1973; Ryan & Deci, 2000a). Moreover, alternative methods for promoting children's interest have been identified. For example, encouraging the use of fantasy and affording opportunities for choice have both been shown to promote children's interest and task engagement (Cordova & Lepper, 1996; Gilovich & Lepper, 1983; Parker & Lepper, 1992). The present studies contrast the effects of using rewards versus providing autonomy support when promoting children's involvement with an uninteresting but important activity. Autonomy support is defined as encouraging initiatives, and providing meaningful rationales for requests, as well as minimizing controlling language (Deci & Ryan, 1985, 1991, 2000).

For activities that children find inherently interesting, using rewards has a paradoxical effect. Receiving expected rewards for doing an activity that one likes and enjoys leads to a decrement in intrinsic motivation (i.e., spontaneous engagement in the activity decreases when reward contingencies are absent) (Deci, Koestner, & Ryan, 1999). This undermining effect occurs regardless of whether rewards are made contingent on simply engaging in the task, completing it, or reaching a performance standard. Furthermore, the negative impact of rewards is more pronounced with children than young adults (Deci et al., 1999). These findings suggest that rewards should be avoided when children are already interested in an activity.

But what about activities that are not inherently interesting or enjoyable? Doing uninteresting tasks is a part of children's everyday life and many such activities are required for effective social functioning. Facilitating motivation for activities such as cleaning one's room, saying "thank you," or doing homework is more difficult than simply letting intrinsic motivation flourish. It is therefore natural to ask whether rewards should be offered to foster motivation for this particular class of activities (i.e., important but uninteresting). In fact, this question was raised as soon as the first

studies indicated that rewards undermined intrinsic motivation for enjoyable tasks. Researchers suspected that the initial level of interest was an important moderating factor and tested this by varying tasks' interest level in the context of the standard intrinsic motivation paradigm (reward or no reward for an activity, followed by a self-report and/or a free-choice period) (e.g., Calder & Staw, 1975).

Thirteen studies have investigated the differential effects of rewards on interesting versus boring tasks. When the results were aggregated meta-analytically (Deci et al., 1999), it was shown that the negative impact of rewards was limited to interesting activities ($d = -0.68$, $p < .001$). For uninteresting tasks, rewards were found to have a slight positive effect on motivation, though this effect did not reach statistical significance ($d = 0.18$, $p = ns$). Thus, research currently suggests no compelling reason for or against the use of rewards when children are faced with doing an uninteresting task.

Although studies have failed to confirm any benefit of using rewards to foster motivation for tedious tasks, parents and teachers continue to rely on rewards to bring about desired behaviors in children. Gold stars, special privileges, and gifts are frequently used to promote desired behaviors in schools (O'Leary & Drabman, 1971; Newby, 1991). Likewise, parents are urged to use rewards to shape their children's behavior at home (e.g., Becker, 1971; Phelan, 1996). Rewards and other controlling strategies are especially popular for children showing behavioral problems. In educational and clinical settings, reward systems are often the interventions of choice. In sum, the use of rewards is a common practice, particularly for children who are thought to have self-regulatory difficulties.

It seems that adults believe that tangible rewards are the best way not only to gain children's compliance, but also to enhance their interest. In a series of survey studies, Boggiano and her colleagues (1987) found that adults favor using tangible rewards with children over less controlling techniques such as reasoning, especially for academic activities. Furthermore, adults do not discriminate between the short-term and long-term effects of rewards or between their differential effects for activities of low versus high initial interest.

In sharp contrast with these common views and practices, Self-Determination Theory (SDT; Deci & Ryan, 1985, 1991, 2000) questions the use of rewards, even for uninteresting activities. Deci

and Ryan acknowledge that rewards successfully control behaviors, but they argue that the goal of socialization efforts should be to promote autonomous self-regulation, not mere compliance with external controls. Similar arguments are made by developmental researchers such as Kochanska and Aksan (1995) and Grusec (1983). From the perspective of SDT, the use of rewards to promote socially desirable behaviors may interfere with the internalization of the activity's value and impede self-regulation. External prompts and reinforcement contingencies communicate that the child should behave in response to socialization agents, but they fail to assist children in learning to integrate new rules or behaviors into their sense of self. SDT therefore recommends a socialization approach that focuses on autonomy support as an alternative to rewards.

There is evidence that autonomy support promotes active engagement with uninteresting but important activities. For example, one study showed that setting limits regarding neatness on young children's painting activity did not adversely affect their intrinsic motivation, enjoyment, and creativity, as long as the limits were provided in an autonomy-supportive manner (Koestner, Ryan, Bernieri, & Holt, 1984). These authors operationalized autonomy support in terms of three elements: (a) acknowledging participants' feelings, (b) offering a meaningful rationale for the requested task, and (c) emphasizing choice rather than using controlling language.

In an experimental study with college students, Deci, Eghrari, Patrick and Leone (1994) confirmed the benefits of supporting autonomy when asking individuals to work at a boring vigilance task. When participants were provided with at least two of the three autonomy-supportive elements (as defined above), they perceived the task more positively and spent more time on task during the free-choice period. More importantly, the results showed that the quality of participants' engagement with an uninteresting activity also varied due to the experimental manipulation. When participants' autonomy was supported, their free-choice engagement and self-reports were positively correlated, reflecting an integrated form of self-regulation. In contrast, in the absence of autonomy support no relation between behavior and affect was observed. In fact, the correlation between the behavioral and the self-report measures was negative, indicating alienated self-regulation.

The level of congruence among affect, value, and behavioral engagement is one useful way to measure the extent to which an activity has been integrated into the self. It is natural to expect that affect, thoughts and behavior will relate to one another (e.g., children who enjoy an activity more will be more likely to engage in it), but it is also possible to imagine situations in which this linkage between attitude and behavior becomes divorced. For example, children may report liking an activity yet fail to engage in it, or they may persist at an activity despite finding it useless. Conflicts related to either internal or external controlling forces can result in displays of alienated functioning (Deci & Ryan, 2000; Koestner, Losier, Vallerand, & Carducci, 1996).

Self-regulation is thus said to be integrated “when a behavioral regulation is something with which the person fully concurs” (Ryan & Deci, 2000b, p. 331). In contrast, when behavior is in conflict with the individual’s values and emotional preferences, inner conflict is experienced and self-regulation can be described as alienated. Indeed, Kuhl and Beckmann (1994) define alienation as difficulty perceiving one’s needs and preferences or as a failure to behave according to one’s emotional preferences.

In total, seven studies using the free-choice paradigm have examined the impact of autonomy and control on the degree of congruence between participants’ behavior and feelings about the activity. Table 1 presents the correlations between free-choice

Table 1
Correlation Coefficients Between Enjoyment and Free-Choice Persistence, as a Function of Autonomy or Controlling Conditions

Study	Type	r Autonomy	r Controlling
Deci et al., 1994	Experimental	.55 (40)	– .44 (19)
Koestner & Zuckerman, 1994	Experimental	.22 (83)	.03 (83)
Koestner et al., 1992, Exp. 1A	Personality	.37 (24)	– .24 (31)
Koestner et al., 1992, Exp. 1B	Personality	.63 (23)	– .07 (32)
Ryan et al., 1991, Exp. 1	Experimental	.70 (16)	.45 (39)
Ryan et al., 1991, Exp. 2	Experimental	.49 (27)	.03 (27)
Ryan et al., 1991, Exp. 3	Experimental	.76 (21)	.22 (22)
Average		.44	.03

persistence and self-reported enjoyment or interest separately for the controlling and autonomous groups in these experiments. It can be seen that only when functioning autonomously was there a reliable positive relation between participants' feelings and behavior. In other words, autonomy seemed to be related to integration, while control was associated with incoherence or alienation. This between-group difference is statistically significant, $QB(1) = 47.41$, $p < .00001$.

It should be noted that in all experiments, other than Deci et al.'s (1994) study, the controlling conditions were situations where participants were led to feel pressured about their performance through ego-involving instructions and that no study has used rewards to induce a controlling context. An examination of the impact of controlling rewards on the level of integration in self-regulation would be important, given Ryan and Deci's contention that rewards often compete with natural tendencies and effective self-regulation (2000a). To date, studies have suggested no benefit or problem with rewards when tasks are uninteresting, but all 13 of these studies relied on the typical intrinsic motivation measures. Given the conceptual problems associated with the use of free-choice motivation measures for uninteresting tasks, an examination of congruence between one's behavior and feelings about the task may be useful (Ryan, Koestner, & Deci, 1991).¹

PRESENT STUDIES

The present study was designed to contrast the impact of reward and autonomy support as strategies to facilitate children's internalization of an important but uninteresting activity. No previous study has used the free-choice paradigm to examine the level of integration in self-regulation among children. The autonomy support condition was constructed after the Koestner et al. (1984) and Deci et al. (1994) experiments. The reward condition involved tangible, engagement-contingent rewards. Engagement-contingent rewards are the ones most often examined in studies of reward effects for

1. It is hard to argue that free engagement in a tedious task reflects enjoyment. In fact, Ryan et al. (1991) note that free-choice activity may reflect processes other than intrinsic motivation (e.g., internal pressure) and suggest using the correlation of affect self-report with free-choice persistence.

uninteresting activities. They are offered for simply engaging in a task, contrary to performance-contingent rewards, which are offered if a certain level of performance is met. Interestingly, Barrett and Boggiano (1988) found that adults do not differentiate between engagement and performance-contingent rewards to promote exposure to uninteresting tasks.

The outcome variables of interest were free-choice persistence and self-reports of affect, as in most motivation studies. In addition, perception of the task's value was measured because of its pertinence to the question of internalization. However, the outcome of most interest was the relation of behavior to affect and value because these relations were thought to reflect integration in relation to the new activity. Other variables were measured, such as performance at the experimental task, to examine whether it could be affected by the independent factors (especially rewards, often thought to improve performance). Also, since rewards are said to be particularly beneficial for children with behavioral difficulties, teachers were asked to rate participants' self-regulatory capacities, and this variable was used to examine whether such individual differences would have a moderating role in our analyses.

Self-determination theory (Deci & Ryan, 1985, 1991, 2000) predicts that autonomy support will promote integrated functioning, whereas expected rewards will promote alienated functioning. No direct effects on each of the intrinsic motivation measures (behavioral or self-report) were predicted however, since the target activity is uninteresting. Recall that the meta-analysis of 13 previous reward studies showed no meaningful effect on either free-choice behavior or self-reported enjoyment for uninteresting activities. Hence, it is principally on the measure of integration (i.e., congruence between one's behavioral engagement and one's feelings about the task) that the effects of autonomy support and rewards were predicted.

We planned to assess integration versus alienation by means of subgroup analyses in which we determined the correlations of free-choice behavior with self-reports of positive affect and task's value. We expected positive correlations in autonomy-supportive conditions but negative correlations in reward conditions. To be sure that we had uncovered reliable statistical effects, we planned to test these hypotheses in two separate experiments that varied slightly in their design. Study 1 used a 2×2 factorial design in which the presence

versus the absence of reward was crossed with the presence versus the absence of autonomy support (i.e., autonomy vs. control). The target activity was a 5-minute vigilance task. Study 2 used a one-way design that contrasted reward, autonomy support, and a control condition. The target activity was a 15-minute vigilance task. The two studies also differed in the order in which self-reports and free-choice behavior were assessed, as some researchers have suggested that this may influence the strength of the relation between affect and behavior (Quattrone, 1985). Obtaining consistent results for autonomy support versus rewards across two somewhat different experiments would argue in favor of the robustness of such effects.

STUDY 1 METHOD

Participants

Participants were 106 French-speaking children in first, third, and fifth grade of an elementary school in Montreal. After having gained permission from the school board, principal, and teachers, children were recruited by sending their parents written consent forms. Participants received instructions for the activity in one of two manners (autonomy-supportive or not) and were further divided in terms of whether they were offered a reward or not. Random assignment to one of the four conditions was blocked by gender (60 boys and 46 girls), grade level (29 first graders, 41 third graders, and 36 fifth graders), and who was presenting the task (pool of three experimenters; 49, 39 and 18).

Materials

Experimental task. The experimental activity was Connors' "Continuous Performance Test" (CPT; 1992), performed on a laptop computer. It is a computerized vigilance task where participants have to press the space bar each time a letter appears on the screen, except if it is the letter "x." The CPT is normally used as a research and assessment tool for attention-deficit hyperactivity disorder. It was used in the present study because it is frequently used with children, who usually find it tedious, and it can also easily be presented as an important exercise, akin to many school tasks. Moreover, the CPT program yields various performance measures (e.g., number of omissions, number of commissions), so that we could control for performance in our analyses.

Since this research is about extrinsic motivation, the experimental task was pretested to confirm that it is not a fun task. A sample of 10 children (5 boys, 5 girls in grades 4 and 5) was asked to engage in four tasks and compare them. All tasks lasted 5 minutes, were performed on a laptop computer, and were presented in a randomized order. The CPT was compared to a fun game (Super Mario), a less fun planning activity (Hanoi towers, a neuropsychological test), and an academic task (series of simple additions, subtractions, and multiplications).

After each task, children rated how much fun it was on a 5-point scale, and when all tasks were completed, children ranked them (*favorite to least preferred*) by pasting the tasks' names on a drawing of a ladder. Within-subjects analyses of variances were conducted with type of task as the only factor. Planned contrasts on the fun rating measure revealed that the CPT was rated as less fun than each of the other activities (p 's < .05). The means and standard deviations were as follows: CPT, $M = 2.4$, $SD = 0.84$; Arithmetic, $M = 3.2$, $SD = 0.79$; Towers, $M = 3.3$, $SD = 0.82$; Mario, $M = 4.6$, $SD = 0.70$. On the preference ranking measure, a similar pattern was found, with the CPT being the least preferred task (p 's < .01). The pilot testing thus confirmed that the CPT is not a fun task.

Rating scales. Participants' teachers assessed their general regulatory style in class by completing short rating scales. The teacher-report consisted of 4 out of the 7 subscales of the Teacher-Child Rating Scale (T-CRS,) assessing dimensions of "Acting-Out," "Learning Problems," "Task Orientation," and "Frustration Tolerance" (Hightower et al., 1986). Together, these 4 subscales reflect a second-order factor called "Engaged-Disengaged" (Cowen et al., 1996). We will refer to this individual difference measure as "teacher-rated self-regulatory skill."

Children self-report measures were used to assess how happy children felt while doing the experimental task as well as how valuable they thought the task was. Two single-item scales were used: positive affect (happy vs. unhappy) was rated from 1 to 6, while perceived value (useful vs. useless) was rated on a 4-point scale. Other items were included for exploratory purposes. Visual aids were used to assist children in making these ratings because it was thought that first graders would have difficulty with a simple numerical scale.

Other material. The rewards used in this study were yo-yos, small toys equally appreciated by boys and girls of various ages. Finally, three comic books were used as an alternative activity to the CPT task for the free-choice period.

Procedure

Participants were tested individually for 20 minutes. Testing was done by two female graduate students at a time: one acting as the experimenter and the other as the interviewer (roles were alternated randomly). First, children were escorted from their class by the interviewer. While walking, she engaged in casual chit-chat to make the child feel comfortable (“What was the class doing? Do you like that?”) and briefly told him/her what to expect. She explained where they were going, that the first part would be done with another experimenter, and that she would come back later to do the second part with him or her. Upon arrival in the room, she introduced the child to the experimenter and left. The experiment then began. Instructional style (autonomy support or control) and the offer of a reward (absent or present) were the two manipulated independent factors of this study.

Manipulation. Instructions for the computer activity were provided in either an autonomy-supportive or a more directive way. These instructions were adapted from Deci et al. (1994). First, the language used distinguished the different instruction styles. While choice was conveyed in autonomy-supportive contexts (e.g., “The proposed activity is...”; “If you choose to continue...”), more directive expressions such as “should,” “must,” and “have to” were included in the control instructions. In addition to conveying choice, autonomy support instructions involved offering a rationale for the computer task (e.g., “This is a useful task. It helps develop vigilance—that’s paying attention, having good reflexes. It’s the kind of task students, athletes, and even astronauts do to improve their vigilance”). Finally, participant’s feelings were acknowledged (e.g., “You might find this task a little boring... I can understand that”). Thus, the control instructions did not include a rationale or empathy statement, and they used directive language. Although no instructions can be said to be “neutral,” we believe that such control instructions are similar to the type of statements teachers typically make when guiding students in class (e.g., “what you have to do now...”; “you should do...”; “pay attention”; etc.).

The other independent variable (expected reward versus no reward) was manipulated during the instructions as well. Children in reward conditions were told, “I am going to give you a yo-yo if you play at this letter game. You will thus be rewarded for your participation.” The yo-yo was briefly shown as the instructions were given and offered immediately after completion of the task. However, they also received the same gift once the experiment was over. The reward was thus engagement-contingent, being offered in exchange for task participation, without any specific standard to meet. Children in no-reward conditions engaged in the task without getting any information about rewards.

An uninteresting task was thus presented to children in four different manners: autonomy-supportive instructions alone, autonomy-supportive instructions with reward, control instructions alone, and control instructions with reward. After receiving instructions, children worked on the target activity for 5 minutes while the experimenter was reading nearby, waiting for the child to indicate that the activity was over. After having worked on the CPT, all participants were told that they did well. For rewarded participants, the yo-yo was offered prior to this positive feedback, to prevent them from seeing the reward as contingent on their performance.

Dependent variables. Following the activity and reward manipulation, the experimenter said that the first part was over and that she had to go get the other experimenter for the second part. Before leaving, she added: "It might take a few minutes...I am not sure where she is" and that if the child wanted to, he or she could do more of the activity (by pressing the space bar) or read some comic books. Those books were left on the table next to the computer in order to provide another available activity. The child was left alone for a free-choice period of 5 minutes, as a behavioral measure of engagement. It was possible to estimate the duration of participants' engagement in the task during this free-choice period from the CPT participation summary. Thus, engagement time served as the behavioral measure of participation under no external obligation.

When the free-choice period was over, the first experimenter came in the room to inquire about the "letter game." Each of the two experimenters conducted different parts of the study to ensure that the "interviewer" would be blind to participants' experimental condition. Moreover, it was thought that this would reduce the importance of social desirability; i.e., that children would feel more comfortable describing the task to the neutral experimenter who had not introduced it. This interviewer asked children how happy they felt while doing the activity and how valuable the activity was, using pictorial scales.

RESULTS AND DISCUSSION

In a first set of analyses, 2×2 analyses of variance with autonomy and reward as between subject factors were performed on positive affect, task's value, and free-choice (FC) duration. All cell means and standard deviations are reported in Table 2. Preliminary analyses of variance with grade, gender, and experimenter as between subject factors were performed, and no significant main effects or interactions with the main dependent variables resulted.

Table 2

Means and Standard Deviations for Positive Affect, Task's Value, and Free-Choice Duration, as a Function of Each Experimental Condition in Study 1

	Control		Autonomy	
	Reward (<i>n</i> = 25)	No-Reward (<i>n</i> = 28)	Reward (<i>n</i> = 29)	No-Reward (<i>n</i> = 24)
Positive Affect	5.20 (0.65)	5.11 (1.10)	5.62 (0.68)	5.54 (0.59)
Value	3.80 (0.41)	3.36 (0.83)	3.66 (0.67)	3.75 (0.44)
Free-Choice	169.7 (121.1)	191.8 (123.1)	193.1 (114.3)	154.6 (124.0)

Note. Affect and Value were rated on 6-point and 4-point scales, respectively. Free-choice activity was measured in seconds (300 maximum).

Therefore, these variables were not included in any of the following analyses.

On the positive affect measure, a significant main effect for autonomy was obtained, $F(1, 102) = 7.74$, $p = .006$, indicating that children in autonomy support groups reported feeling happier ($M = 5.58$) while performing the task than children in the control groups ($M = 5.15$). No other effects approached significance ($ps > .20$).

On perception of the task's value, the ANOVA revealed no significant main effect ($ps > .20$), but a significant interaction effect emerged $F(1, 102) = 4.92$, $p < .05$, indicating that children receiving control instructions only saw the task as less valuable than children in the other groups. Since this finding was unforeseen, it will not be discussed further.

Finally, on duration of free-choice, the two-way ANOVA revealed no effect approaching significance ($ps > .20$). Neither reward nor autonomy had an impact on this behavioral measure. Participation during the free-choice period was approximately equal in duration for children in all experimental groups.

Supplemental 2×2 ANOVAs were performed in order to assess whether experimental conditions had an impact on the actual CPT performance of participants. These analyses were performed on all performance scores (e.g., omissions and commission errors, response times) and revealed that experimental manipulations had no effect on any of them ($ps > .20$).

Other supplemental analyses were performed, to examine whether participants' self-regulation capacity served as a moderator. Teacher-rated self-regulatory skill was included in hierarchical multiple regressions (along with autonomy and reward) on the main dependent variables (affect, value, duration of free-choice) and the results revealed no significant main or interaction effects with this individual difference factor.

Integration Findings

The correlations between duration of free-choice behavior and each of the self-reported measures were calculated separately for participants in each of the four experimental conditions. The correlations are reported in Table 3. The split-group correlational analyses reveal the same pattern across self-report measures (FC and affect, FC and value).

For participants receiving control instructions only, there was no relation found between behavior and self-reports. Furthermore, when a reward was used in addition to the control directions, the relation between behavior and feelings about the task was found to be negative. For children who received autonomy-supportive instructions only, there was a positive correlation between free-choice behavior and self-reports of positive affect. Finally, when participants were offered a reward in addition to autonomy support, there was no congruence between participants' behaviors and their feelings about the task.

Table 3
Correlation Coefficients Between Free-Choice Duration and Each of the Self-Report Variables (Positive Affect, Value), as a Function of Experimental Conditions in Study 1

	Control		Autonomy	
	Reward (<i>n</i> = 25)	No-Reward (<i>n</i> = 28)	Reward (<i>n</i> = 29)	No-Reward (<i>n</i> = 24)
FC and Affect	-0.33	0.06	0.07	0.38 [†]
FC and Value	-0.44*	0.04	0.20	0.00

Note. Affect and Value were rated on 6-point and 4-point scales, respectively. Free-choice activity was measured in seconds (300 maximum).

[†]*p* < .10. **p* < .05.

A series of *Z*-tests of linear contrasts between the four groups was performed. The weights used were -3 for rewards only, -1 for control, 1 for rewards plus autonomy, and 3 for autonomy (Rosenthal & Rosnow, 1984). On the relation between FC behavior and positive affect, the result was statistically significant, $Z = 2.33$, $p = .02$. Regarding the relation between FC and task's value, the linear trend was marginally significant, $Z = 1.64$, $p = .10$. The same trend emerged from the two linear contrasts. That is, autonomy support alone produced the highest level of integration, reward with control instructions produced the lowest level of integration, and control instructions alone and the combination of autonomy support with reward fell in between.

Summary

The results showed that autonomy support was more beneficial than rewards, leading children to feel happier while doing the new task. Importantly, autonomy support was associated with a more integrated self-regulation for an uninteresting vigilance task. The pattern of correlational results between free-choice behavior and feelings about the task perfectly matched those obtained in previous studies contrasting autonomous and controlled functioning. It seems that a hidden cost of rewards for children is that it produces an alienated form of self-regulation.

STUDY 2

The results of Study 1 were consistent with predictions derived from self-determination theory. The reward effects that were found were negative. While rewards had no impact on behavioral and self-report variables, they led to behavior that was alienated from feelings about the task when they were used without autonomy-supportive instructions. In contrast, autonomy support was associated with more positive affect while engaging in the experimental task, as well as an integrated form of self-regulation. The joint effect of autonomy support plus reward was more difficult to interpret. It seemed that combining the two strategies led to the same low level of congruence in self-regulation as no intervention at all. This condition will not be included in the next study in order to examine the specific effects of each intervention alone.

A limitation of Study 1 was the short duration of the supervised CPT participation. While similar in content and duration to the activity used by Deci et al. (1994), children in our study seemed to find some interest in it. In fact, while only 31% of the college students in Deci's study continued working on the vigilance task during the free-choice period, 74% of our participants did so. It is possible that calling CPT a letter "game" influenced task liking. Although pilot testing revealed that engaging in CPT for 5 minutes was not much fun, this short version is probably less boring than the standard 15-minute version. It is unclear whether the results found in Study 1 would generalize to a longer and more tedious activity. Study 2 was conducted to test this.

METHOD

Participants

Seventy-six children from grades three to six participated in this study. They were recruited from three different elementary schools, in the same school board as for Study 1. The experimental activity was presented to participants in one of three ways: with autonomy support, with control instructions alone, or with rewards and control instructions. Random assignment to one of the three conditions was blocked by gender (37 boys and 39 girls), grade level (6 in third, 16 in fourth, 41 in fifth and 13 in sixth grade), and experimenter (20 vs. 56).

Materials

As in Study 1, the presented activity was Connors' (1992) "Continuous Performance Test." However, a more tedious version of 15 minutes (standard paradigm) was used in the present study. Other material differences were the rewards used (attractive pencils with an animal "pen topper" rather than yo-yos) and the self-report materials. A short self-report questionnaire was developed to assess children's emotions and their perceptions of the task's value. Rather than using drawing scales, a simple written questionnaire was used because all participating children were at least 8 years of age and could easily complete the ratings. The single-item scale for positive affect was "I felt happy while doing the activity" and the item for value was "I found this activity valuable." All items were followed by a 4-point Likert scale extending from 1 (*not at all*) to 4 (*a lot*). Other items were included for exploratory purposes. Finally, participants' general self-regulation skill was rated by their teachers with the T-CRS (Hightower et al., 1986).

Procedure

Participants were tested individually for 30 minutes by one (of two) female experimenter. She provided the instructions according to the assigned condition and read while the child worked on the target activity. The CPT was referred to as an activity rather than a game. Upon completion of the task, she administered the self-report questionnaire and then left the child alone to assess behavioral persistence. As in Study 1, the reward was offered as an unexpected thank-you gift to participants in no-reward groups, before bringing them back to class.

Manipulation. The experimenter presented the task in one of three different manners: with autonomy-supportive instructions, with control instructions and the offer of an engagement-contingent reward, or with control instructions alone. Thus, only three of the four conditions found in Study 1 were present in this study (there was no group with both autonomy support and reward). Instructions and reward manipulations took place as in the previous study.

Dependent variables. Following the activity and the reward manipulation, all participants were told they had done well on the task. While placing the laptop computer slightly away from the child, the experimenter said that the first part was over. Then, children were asked to complete the self-report questionnaire about the activity and to put it in an envelope, thus emphasizing anonymity. This questionnaire assessed various perceptions, including how happy they felt while engaging in the task and how valuable the task was. Four-point Likert scales ranging from 1 (*not at all*) to 4 (*a lot*) were used for each of these items.

When the experimenter left the room supposedly to retrieve a missing questionnaire, participants were left alone for a free-choice period of 5 minutes. As in the first study, duration of participation was electronically recorded and served as the behavioral measure of persistence to perform the CPT under no external obligation. The degree of congruence between participants' feelings about the task and their free-choice behavior was the main dependent measure.

As in Study 1, participants' performance on the CPT and their general self-regulatory skill (T-CRS) were recorded to explore whether the experimental manipulation could have an impact on performance level and to examine the potentially moderating effect of individual differences in self-regulation on the relation between conditions and dependent measures.

RESULTS AND DISCUSSION

The three dependent variables were the same as in Study 1: feeling happy while doing the task, seeing the task's value, and the duration of free-choice activity. The central analyses were analogous to those in Study 1. First, one-way ANOVAs were conducted to examine the effect of condition on the key dependent variables. Means and standard deviations can be found in Table 4. Secondly, split-group correlational analyses were performed to look at the level of congruence between the behavioral and self-report measures.

A set of preliminary analyses was done with sex, grade, and experimenter on the main dependent variables. None of these variables were found to have an impact on participants' ratings of the task's value, or on the duration of their free-choice engagement, ($ps > .20$). Regarding the reported positive affect, the only variable that had an effect was experimenter $F(2, 73) = 3.12, p = .05$. However, there was no interaction between condition and experimenter ($p < .20$). As in Study 1, grade, sex, and experimenter were not included in any of the subsequent analyses.

On the positive affect measure, the one-way ANOVA yielded no effect for condition, ($ps > .20$). Children in all groups reported approximately the same level of happiness while performing the boring task under supervision.

A significant effect of condition emerged in the ANOVA of task's value, $F(2, 73) = 3.68, p < .05$. A Sheffe post-hoc comparison indicated that children in the autonomy support condition reported

Table 4
Means and Standard Deviations for Positive Affect, Task's Value, and Free-Choice Duration, as a Function of Each Experimental Condition in Study 2

	Control/Reward ($n = 24$)	Control/No-Reward ($n = 25$)	Autonomy ($n = 26$)
Positive Affect	3.44 (0.77)	3.64 (0.57)	3.31 (0.93)
Value	2.48 (1.23)	3.08 (1.08)	3.27 (0.92)
Free-Choice	53.3 (98.1)	73.6 (119.5)	78.5 (120.9)

Note. Affect and Value were rated on 4-point scales. Free-choice activity was measured in seconds (300 maximum).

finding the task significantly more valuable than the children in the reward condition. Children in the control condition reported a level of perceived value midway between the reward and autonomy support conditions. Finally, no effect approaching significance emerged for the free-choice behavior ($ps > .20$).

As in Study 1, supplemental analyses were performed. One-way ANOVAs revealed no condition effects on any of the CPT performance scores. Secondly, hierarchical multiple regressions with teacher-rated self-regulatory skill yielded nonsignificant results, indicating it had no moderating effects on any of the main dependent variables.

Integration Findings

The correlations between free-choice behavior and each of the self-report measures were calculated separately for participants in the three experimental conditions. Table 5 presents these correlations. It can be seen that the same pattern from Study 1 was found across the two self-report measures (FC and affect, FC and value).

Split-group correlational analyses reveal that the strongest positive relations between behavior and affect were found among children in the autonomy-supportive condition. There was less congruency between FC and self-reports among children in the control condition, and finally, rewarded children's behavior and feelings about the task were incongruent (negative correlations).

Z-tests of linear contrasts for the three conditions were performed, with weights of -1 for reward, 0 for control and 1 for autonomy (Rosenthal & Rosnow, 1984). On the relation between FC behavior and positive affect, the result was statistically significant, $Z = 2.20$, $p = .03$. The linear trend for the FC and task's value relationship was also significant, $Z = 2.04$, $p = .04$. The same trend emerged from these two linear contrasts. Autonomy support led to integration; rewards were associated with behavior alienated from feelings about the task; and the control group fell in between.

Summary

Reward and autonomy support had no effect on the free engagement or on the level of positive affect. The absence of effect on positive affect may be due to the task's low level of interest;

Table 5
Correlation Coefficients Between Free-Choice Duration and Each of the Self-Report Variables, (Positive Affect, Value), as a Function of Experimental Conditions in Study 2

	Control/Reward (<i>n</i> = 24)	Control/No-Reward (<i>n</i> = 25)	Autonomy (<i>n</i> = 26)
FC and Affect	− 0.20	0.27	0.43*
FC and Value	− 0.39 [†]	0.11	0.20

Note. Affect and Value were rated on 4-point scales. Free-choice activity was measured in seconds (300 maximum).

[†]*p* < .10 **p* < .05.

perhaps no strategy used here could enhance the way participants felt while engaging in this lengthy vigilance task. However, on the perceived value of the task, autonomy support had a positive impact. This latter finding suggests that autonomy is important in the process of internalization. Finally, the Study 1 finding regarding integration in self-regulation was replicated in this study, with autonomy support leading to integrated functioning and rewards associated with alienated self-regulation. Thus, even if the task was very tedious (with a free-choice participation rate of only 30%), autonomy support, but not rewards, was found to promote internalization of the task's value and an integrated self-regulation process.²

Combining Results Across Studies

Supplemental analyses were performed to examine the level of integration in self-regulation across both Study 1 and Study 2. These analyses allowed an examination of integration across levels of task'

2. We included all participants in our analyses, including those who showed no free-choice time. One of the studies cited in Table 1, Deci et al., 1994, restricted their consistency analyses to those participants who showed at least some free-choice persistence. All of the other studies have included all participants in their analyses. The alienation phenomenon that we identified can be seen as equally relevant for those who desisted despite liking the task as for those who persisted despite disliking the task. However, when we only consider those participants who actually did persist to some extent, our split-group correlational results across the two studies yield the same pattern as reported for the entire sample.

interest, in addition to providing more reliable results, due to a larger sample size (n s between 49 and 53 per group). The correlations are reported in Table 6. Split-group correlational analyses between free-choice duration and each of the self-report measures were performed, and results revealed the same pattern as in each separate study. That is, while positive correlations between behavior and affect were found in the autonomy support group, no relation emerged in the control group, and behavior tended to be negatively correlated with self-reports in the reward group.

Z-tests were performed on each of these linear trends, with weights of -1 for reward, 0 for control and 1 for autonomy. Results revealed a significant contrast for affect/behavior correlations, $Z = 3.03$, $p < .01$, as well as for the value-behavior correlations, $Z = 2.48$, $p < .01$. These results suggest that autonomy support promoted integrated self-regulation whereas engagement-contingent rewards promoted an alienated form of self-regulation (incongruence between one's behavior and feelings about the task).

GENERAL DISCUSSION

The present studies were designed to compare the effects of rewards and autonomy support as motivational strategies for introducing an uninteresting activity to children. In general, the effects of rewards found in these studies were either null or negative. No reward effects were found on participants' perception of the task's value, on their emotions during task engagement, or on their behavioral persistence during a free-choice period. Therefore, rewards had no impact on individual measures of participants' cognitive, affective, or behavioral experience with the experimental task. Moreover, rewards tended to be associated with a lack of congruence between behavior and feelings about the task across both studies. Thus, consistent with SDT, rewards led to alienated self-regulation and this finding points to a hidden cost of rewards.

In contrast, autonomy support was found to have various positive effects on children's capacity to integrate an uninteresting task. Although autonomy support had no impact on free-choice persistence, this motivational approach led to a better appreciation of the task's value for the longer task, as well as more positive affect when the task was of limited duration. In terms of congruence

Table 6

Correlation Coefficients Between Free-Choice Duration and Each of the Self-Report Variables (Positive Affect, Value), as a Function of Experimental Conditions in Combined Studies

	Control/Reward (<i>n</i> = 49)	Control/No-Reward (<i>n</i> = 53)	Autonomy (<i>n</i> = 49)
FC and Affect	-0.26 [†]	0.11	0.35*
FC and Value	-0.36*	0.06	0.14

Note. Standardized scores of all variables (affect, value, FC activity) were used in these analyses.

[†]*p* < .10. **p* < .05.

between behavior with affect and thoughts, autonomy support was found to have a positive impact: children tended to self-regulate in an integrated manner. In the SDT framework, such coherence reflects an autonomous type of self-regulation since participants acted in accord with how they felt and what they thought of the task.

The outcome of most interest in the present studies was the correlation between participants' behavior and their feelings about the task. Previous empirical studies of rewards suggested no clear benefit or detriment, but they were limited by relying solely on self-report or free-choice measures of motivation. Combining these measures allowed us to make inferences about the quality or the process of self-regulation, and our results indicate that rewards had a pernicious effect. These results are consistent with previous studies comparing the effect of control and autonomy on affect-behavior correlations (see Table 1) and they identify rewards as another controlling technique leading to affect-behavior discrepancy. According to SDT (Deci & Ryan, 1985, 1991, 2000), people have a natural tendency to integrate extrinsic values and regulations within the self, but social contexts can challenge this natural process (Ryan, 1995). The present results suggest that rewards are one contextual factor that can hinder integration. Together, these results shed further light on the effects of motivation strategies for uninteresting tasks.

An important issue to explore in future research is what psychological event led to alienated self-regulation in rewarded participants. Since integrated individuals have been described as

tuned in to their inner feelings, values, and needs (e.g., Sherman & Fazio, 1983; Sheldon & Kasser, 1995), one possible cause for the negative effect of reward could be a lack of awareness to these internal cues. In fact, Ryan, Kuhl, and Deci (1997) report that “for controlled regulation, the actor’s task involves suppressing or inhibiting access to holistic representations and instead focusing on control-relevant information in the environment or its introjected structures” (p. 717). Perhaps rewarded children were less aware of their personal opinion and affective states, focusing instead on tangible rewards. However, the fact that rewarded participants tended to act *opposite* to their thoughts and feelings points to a potentially more dynamic effect in which individuals respond to rewards in a reactive manner so that they actually thwart the possibility for need-satisfying experiences (Deci & Ryan, 2000).

Self-regulating with such inner conflict could have a detrimental impact both on children’s well-being and on their internalization of the target activity. First, integration (vs. alienation) is a key concept in psychology that is associated with adaptive development (e.g., Cicchetti & Tucker, 1994), psychological health and well-being (e.g., Seeman, 1983; Sheldon & Kasser, 1995; Ryan, Deci, & Grolnick, 1995). In the present studies, an autonomy-supportive approach led to more enjoyment, internalization of the task’s value, and more integrated functioning. In contrast, a detrimental effect of rewards was detected after only a brief exposure to this controlling context. The results thus suggest that contingent rewards can have an almost instant impact on alienation. One could expect that rigid, alienated functioning at a global level could result after years spent in controlling contexts. For example, perhaps long-term exposure to controlling rewards could mold children’s personality such that they develop an extrinsic causality orientation in general (Vallerand, 1997). Several recent studies have indicated that such an extrinsic orientation is associated with low levels of well-being (Kasser & Ryan, 1993, 1996; Sheldon & Kasser, 1998).

The task’s internalization could also be affected by self-regulation styles. Evaluation of the effectiveness of teaching strategies depends on what goals socializing agents have for children. If compliance is the goal, then rewards seem to be an effective strategy because they control behavior quickly. However, one problem with this goal is that it distracts from the more important developmental task of

integration, thus more autonomous self-regulation. Compared to autonomous self-regulation, controlled behavior lacks “cohesive commitment” and is less likely to be sustained in difficult conditions (Ryan et al., 1997). Rewards bring about compliance as long as they are operative, but our results suggest that this popular method may impede the longer-term goal of autonomous internalization and regulation that is well integrated into the sense of self. The present studies suggest that uninteresting but important tasks seem to be best integrated within autonomy-supportive rather than controlling contexts. Moreover, while no performance effects were found in these experiments, it is possible that controlled regulation will impede performance in the long run by increasing the likelihood of burnout and dropout (Vallerand & Bissonnette, 1992; Vallerand, Fortier, & Guay, 1997).

Since our research project used an experimental task, it is limited in its ecological validity. However, similar counterproductive effects of controlling procedures on self-regulation have also been identified in studies looking at real-life tasks. For example, when a reward was offered for an uninteresting but prosocial behavior, children who were used to being rewarded by their mothers showed decreased free-choice prosocial behavior (Fabes, Eisenberg, Fultz, & Miller, 1988). Another limitation of our studies is the use of single-item scales. Although this format was practical with a child population and the time constraints that come with doing a study in a school setting, it would have been better to include multiple-item scales to measure affect and value.

The present results argue against the common practice of using rewards to promote children’s integration of new tasks. Despite extensive research showing that they have detrimental effects, rewards are still very popular. One reason might be that rewards are commonly believed to increase performance. In our studies, we found no such performance increment. Another reason why socializing agents lean toward behavioral strategies such as rewards may be to control “difficult” children. We found, however, that our pattern of results was not moderated by children’s self-regulatory capacities in class. Although most participants in the present studies came from regular schools, teacher ratings revealed a wide range of behavioral adjustment levels. Whether our findings generalize to children with very severe behavioral disorders still needs to be explored in future research.

It is important to note that arguing against the use of rewards to motivate children should not be interpreted as advocating permissiveness. As Grolnick (2003) noted, the use of goals, guidelines, and limit setting is often important even if children cannot be expected to like them. Without such structures, children will be unlikely to internalize essential cultural values. The question is how to provide these structures in a context that supports autonomy. The answer seems to be that autonomy support involves taking children's perspective and encouraging self-initiation and personal responsibility. In contrast to a permissive style, supporting autonomy requires a high level of attentiveness and responsiveness to children. Instead of adopting a laissez-faire posture toward a child's activities, autonomy support "requires being clear, being consistent, and setting limits in an understandable, empathic manner" (Deci & Flaste, 1995, p. 104).

As an alternative to rewards, the present studies suggest the use of an autonomy-supportive approach. For fun activities, autonomy support means avoiding external reinforcements and simply letting intrinsic motivation flourish. For uninteresting but important tasks such as the one used in the present studies, autonomy support can be operationalized by three ingredients: empathy, choice, rationale. Communicating a rationale is particularly critical because it means helping children understand why they should engage in the task, allowing them to see personal meaning in it and thus internalize the task autonomously.

But what if children are required to do a task for which it is impossible to provide a good rationale for performing it? Unfortunately, it is probably not uncommon for parents to be in a position of encouraging their children to perform a simplistic and repetitive school assignment that seems (or maybe even is) patently useless. Most parents would probably say, "if the teacher assigned it, that means you have to do it," but more autonomy-supportive responses could be imagined. For example, a parent can echo the child's predicament in saying that the homework sure doesn't seem valuable, but that, unfortunately, completing such tasks is part of the role of student. It is a matter of resignation, and empathy would probably be a key element. Another approach could be to encourage children to find a rationale themselves, as a way try to make the task personally meaningful (e.g., "I am not learning more math, but it helps me practice my memory, or my patience"). Finally, perhaps,

parents could collaborate with their child to think about a way to talk to the teacher and ask for more meaningful and challenging exercises. It would be very interesting to examine whether such autonomy-supportive responses would help children cope with being assigned useless activities.

Our results are in line with SDT (Deci & Ryan, 1985, 1991, 2000) and point to the importance of supporting children's sense of autonomy. But how does one become autonomy-supportive? Does it only consist of three elements? In a recent study, Reeve and his colleagues identified numerous behaviors that characterized autonomy-supportive teachers from more controlling ones (Reeve, Bolt, & Cai, 1999a). For example, they were more likely to listen, respond to questions, and make perspective-taking statements. They were also less likely to withhold the material, use commands, or reveal solutions. Some interpersonal style ratings also served to describe autonomy-supportive teachers, such as "student centered," "promotes a valuing of task," and "supports student's confidence." Importantly, it was shown in an experiment (Reeve, 1998) that this approach can be learned with instruction, that it is not simply a personality style.

The present investigation identified another hidden cost to using rewards: it alienates children's behavior from their thoughts and feelings. A meta-analysis as well as two empirical studies were conducted and showed that autonomy support promotes an integrated self-regulation process. Clinical researchers have suggested that such integration represents a hallmark of healthy, adaptive self-regulation (Gruen, 1988). Our findings thus suggest that parents and teachers should question their automatic reliance on rewards to promote motivation and instead consider strategies that are more likely to support children's autonomy.

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