CENTER ON EDUCATION POLICY CEP

2. Can Money or Other Rewards Motivate Students?

This is the second in a series of six papers from the Center on Education Policy exploring issues related to students' motivation to learn. The first paper provides the general context for the topic and background information on theories and dimensions of motivation. The major findings from all six papers are summarized in the CEP report Student Motivation—An Overlooked Piece of School Reform.

Imagine you are back in kindergarten and your teacher offers you a piece of candy for correctly reciting the alphabet. Now imagine you are in 3rd grade and you're told that if you can complete the sevens times table without a mistake, you can have an extra five minutes of recess. Finally, imagine yourself in high school. What will it take to convince you to study for your chemistry test? The promise of a longer lunch break? A homework pass? How about $50 in cash? This may sound like the daydream of a bored student, but such programs are the reality in a growing number of schools and districts across the country.

As noted in the first paper of this series, motivation to learn is one of the most important factors in a student's educational journey, but a robust discussion about students' motivation may be the "missing piece" of education reform. So how can we ensure that students are motivated? This paper examines one possibility—pure rewards. Perhaps this is the easiest answer to the challenge of engaging students; as they say, money is the universal language. So why not just pay students to exhibit the behavior we want, whether it's higher grades, higher test scores, or increased attendance? Why get bogged down in trying to convince students to believe intrinsically in the value of learning? In fact, this idea has taken shape in various forms in schools across the nation, but whether such programs work "continues to be a raging debate," according to Penn State University professor Barbara Marinak (cited in Guernsey, 2009).

Arguments For and Against Rewards as Motivators

A review of the arguments made by proponents and opponents is helpful to understanding the controversy about rewards.

Arguments for reward programs

- Education is unique because the costs are up front, in terms of time and effort expended, while the benefits are delayed and sometimes difficult to grasp. Short-term rewards can balance that discrepancy (Wallace, 2009).

- Rewards are nothing new in education. Most of us remember smiley-face stickers, gold star charts, or the teacher's candy jar. But perhaps rewards need to change with the times. As one Baltimore teacher said, "Some teachers give children candy, some teachers give them school supplies. We have a new era of children coming through. For a lot of them, money is a motivator." For wealthier parents, rewarding children with money is nothing new—allowing schools to do the same for all children simply evens the playing field (Miller, 2008).

- Even if students only study for a test or finish their math homework because they desire the reward, they're still studying more or doing more math than they would have otherwise (Willingham, 2008).

- In the process of pursuing the reward, students may learn something—such as better study skills or higher self-confidence—that will lead to changed behavior even after the reward disappears (Wallace, 2009).

- Rewards can be used to teach financial literacy and long-term goal setting—especially if cash rewards are put into a scholarship fund or if rewards are structured as a system of points that students can use to "buy" other privileges (Wallace, 2009).

- In some cases, a task simply has no other motivator, such as the program described later in this paper that pays students for taking state standardized tests that have no effect on students' individual grades but are important for the school (Mitchell, 2008).

Arguments against reward programs

- Classrooms should be about fostering learning and curiosity, not training students to perform with treats (Willingham, 2008).

- Reward programs are unrealistic because they can't go on forever, but when the reward is taken away, students no longer have a reason to continue their behavior (Willingham, 2008).

- If the reward is too large, students may feel they have no choice but to take part, which can strip away their feelings of control and decrease motivation (Willingham, 2008). Oversized rewards can also raise ethical issues about whether students are being coerced.

- Some rewards encourage compliance instead of cognition, and this is not what true learning is about (National Research Council, 2004).

- There is some evidence that extrinsic rewards can decrease intrinsic motivation (Rigby et al., 1992), especially when students see the reward as a method of control, or when the activity being rewarded was initially done purely for enjoyment (Pintrich, 2003). Several researchers have found that rewarding a student for an activity they inherently enjoy decreases motivation to perform that activity in the future (Willingham, 2008).

- Performance rewards are unfair because some students are naturally talented, while others work very hard but don't perform well; some will earn rewards easily while others will try hard only to become frustrated (Wallace, 2009).

- As discussed in the first paper in this series, students show a decrease in motivation as they get older, but extrinsic rewards have the smallest effect on secondary school students (National Research Council, 2004).

How Do the Four Dimensions of Motivation Apply to Rewards?

As discussed in the first paper in this series, most scholars agree that four dimensions are critical to motivation: competence, control/autonomy, interest/value, and relatedness.

All of these factors need to be addressed for a reward system to work best. For example, regarding the argument that reward systems are unfair because of differences in students' abilities psychologists might say this problem can be balanced by rewarding behaviors that students can control, such as completing homework assignments or reading a certain number of pages per night. Doing so plays into the autonomy/control factor and spurs students' feelings of competence for completing the task. In fact, such a reward system could even encourage relatedness if students who previously struggled feel they are accomplishing the same things as the rest of the group, further increasing motivation.

What Has Research Shown About Rewards as Motivators?

Research based on motivational theory suggests several elements need to be considered in the design of reward programs to improve student motivation,

Rewarding mastery vs. performance

If a reward system is designed poorly, it can actually discourage motivation, say psychologists. In one experiment, Edward Deci found that kids who were rewarded for drawing drew more often, but when the reward was removed, they drew *less* often than they originally had and were less likely to do so purely for pleasure later (Ripley, 2010). Students are also less likely to work hard, psychologists say, if a reward system goes counter to one of the four critical dimensions of motivation—for example, if the task being rewarded is too hard, thereby impeding competence, or if students feel they have no control over whether they're rewarded because the payoff is too delayed or is based on something like grades that students can't directly control (Willingham, 2008). Most research suggests that rewarding students' performance—such as whether they outscore their peers or reach a certain performance level on a test—is less effective in the long run than rewarding their mastery of a task, skill, or subject. Research has found that students who pursue mastery goals rather than performance goals "display positive affect, flexible and adaptive strategy use, and deep cognitive engagement in the task. They will tend to persist at difficult problems and learn from their mistakes," unlike students who are encouraged chiefly to reach certain levels of performance and are more likely to demonstrate avoidance, helplessness, and frustration with failure (Seifert, 2004, p. 146).

This all makes sense if we think back to the factors necessary for motivation. If students approach learning with performance goals in mind, they are constantly attempting to validate their ability. If they fail, this can signify a lack of ability in their minds, undermining their feelings of competence. Likewise, if students feel the bar is set too high, competence and control are undermined. And if students think that failing to reach a certain level will indicate a lack of ability, they may proactively scale back their effort as an avoidance measure or excuse (Heymen & Dweck, 1992). Indeed, performance goals have been found to be "associated with the avoidance of challenge" even when students have high levels of confidence in their abilities (Heyman & Dweck, 1992, p. 237). Meanwhile, children who approach learning with a mastery-goal orientation are better able to transfer their knowledge to new situations, retain their learning longer, develop better strategies to overcome failure, and be less likely to avoid challenging situations (Heymen & Dweck, 1992). Similar findings have been repeated numerous times (Ryan, 1982; Deci et al., 1981; Benware & Deci, 1984; Dweck, 1986). On a related note, Mueller & Dweck found that when adults praise students for their effort or strategy, those students are better able to deal with failure than students who are praised for their intelligence or performance (Mueller & Dweck, 1998; Dweck, 2010).

Expected vs. unexpected rewards

Also important in the design of reward programs is whether or not the participants are expecting to receive a reward when they first begin the task. A groundbreaking study in the 1970s examined whether children participating in a reward program behaved differently

when the reward was expected versus when it was unexpected. Lepper, Green, and Nisbett (1973) found that an unexpected reward given after completing a task greatly increased the interest of students who were not very interested in the task to begin with, but resulted in only "a trivial decrease in interest" among students who were initially more interested in the task (p. 135). On the other hand, children who entered into the activity *expecting* to receive a reward spent less time and effort on the activity and showed a substantial decrease in interest after receiving the reward. A meta-analysis by Edward Deci and his colleagues reaffirmed this point, finding that unexpected rewards generally do not undermine intrinsic motivation, as expected rewards have been shown to do (Deci et al., 1999). However, a program that utilizes unexpected rewards would not entice students to make the same adjustments to their behavior in anticipation of the reward.

Rewarding extrinsic vs. intrinsic motivation

Research has also shown a positive correlation between increased *intrinsic* motivation and increased engagement in school, better psychological and social health, and a general improvement in learning (Pintrich, 2003). That correlation is absent, however, when only *extrinsic* motivation is increased—and paying students for certain accomplishments is purely extrinsic. At least two sets of researchers found that subjects offered a financial reward for solving a series of problems had a more difficult time when they were asked to solve problems that required a different strategy, which suggests that the reward had undermined "cognitive flexibility" (Rigby et al., 1992). It has also been demonstrated that rewarding artistic projects both reduces creativity (Rigby et al., 1992) and makes it less likely that the subject will undertake a similar project in the future without the promise of a reward (Willingham, 2008). However, researchers have found that extrinsic rewards "can sometimes complement or increase intrinsic motivation" if implemented correctly (Rigby et al., 1992, p. 168).

Based on this evidence from cognitive psychology, designers of reward programs need to be extremely cautious about what behavior they reward. Beneficial and detrimental program design will be discussed in more detail later in this paper, but the theoretical context can help understand why certain programs may be more or less effective than others.

What Are the Effects of Reward Programs?

Despite the controversy surrounding reward programs, they have obviously been viewed as a viable option in schools all over the country. But do these programs work? Unfortunately, the research base is limited; only a few studies have examined the effects of actual reward programs in a systematic way. In addition, many programs exist in just one district, one school, or even one classroom. Comparing results across programs is very

difficult because each is unique; even when programs are similar in the type of reward, each district or school may implement them differently (Singer-Vine, 2008).
It is also important to keep in mind that two separate processes are at work: what happens during the reward program and what happens after the program ends. A correctly designed program should affect student behavior. But when the program ends and the reward is removed, outcomes are much more variable and less often measured by studies.

With these caveats, the findings of three studies allow us to learn something about how such programs work.

- ***Coshocton, Ohio.*** This school district implemented a program that paid elementary school students up to $100 for score on state exams.

  Results: A study by Eric P. Bettinger found that the Coshocton program yielded mixed results. Math scores on state exams improved in grades 3-6, but there were no significant gains in reading, science, or social studies scores. The program had the largest effect in improving the scores of students who were already likely to pass the test. At the same time, students eligible for the cash reward one year but not the following year saw smaller test score gains after rewards disappeared, suggesting the benefits were not sustainable (Viadero, 2008).

- ***Chicago, Dallas, D.C., New York***. The most comprehensive study of reward programs was conducted by Harvard economist Roland Fryer (2011). He worked with schools in Chicago, Dallas, Washington, D.C., and New York City to implement and study the outcomes of four reward programs of varying design that reached 18,000 students. Most of the programs were privately funded, but some had financial help from the districts. The Chicago program reached 4,396 9th graders from 20 schools, paying them for good grades—$50 for each A, $35 for each B, and $20 for each C—for a total of up to $2,000 per year. The average earning per student was $700, and half of the earnings were put into a bank account that was made available to the student upon graduation from high school. In Dallas, 1,780 2nd graders from 22 schools were paid $2 each time they read a book and took a corresponding online quiz. On average, students earned $14 per year. The Washington, D.C. program targeted 3,495 students from 17 middle schools, paying them based on various factors that were chosen by each school but always included good attendance and behavior. Students were paid up to $100 dollars every two weeks, with an average yearly earnings of $532. Lastly, in New York, 8,320 4th and 7th graders from 63 schools could earn cash for increasing tests scores—$25 per test for 4th graders and $50 for 7th graders. The average earnings for the year were $139 for 4th graders and $231 for 7th graders; most parents reported depositing at least some of that sum into a savings account.

  Results: Fryer found that the programs, each of which rewarded students for different behavior on a different time frame, exhibited very different outcomes. Paying students

for test scores led to the worst results; students in New York showed no increase in grades or test scores. This is particularly interesting because although students claimed to be excited about the prospect of money (fulfilling the interest/value dimension of motivation), they had little knowledge of how to control their test scores. In fact, although students reported in interviews that they had tried different test-taking strategies to increase scores, not one said they had stayed after school for academic help. In Chicago, paying for better grades at the end of the year had a mixed effect—grades and attendance went up, but test scores did not. In this case, students had partial control over the outcome and so partially changed their behavior by attending class more (1.5 weeks more, on average). This resulted in higher grades for some, but not all, and no increase in learning. The Washington, D.C., program had decent results. Students were paid frequently for things they could control like attendance and good behavior. Reading test scores and skills improved, especially for kids with a history of behavior problems. Dallas, interestingly, had by far the best results. Students were paid for something entirely under their control, and the program targeted the youngest students of all. Students in the Dallas program saw a dramatic increase in standardized test scores; these gains continued at about half the rate the year after the program ended (Ripley, 2010; Fryer, 2011). After-program effects in the other cities were not discussed in the study.

- **Charter schools.** Margaret Raymond of Stanford University examined various reward programs used in 186 charter schools in 17 states that had been open for two or more years and served students in grade 4 or higher (Raymond, 2008). After surveying the schools in 2007, she designed a matrix that displayed whether the school had a reward program and whether it rewarded academics or behavior, and that ranked how intensely the program evaluated each student.

  Results: Raymond found that 57% of the charter schools surveyed had some sort of reward system in place; 40% used a system that accumulated rewards over time (positive incentives), 30% used a system that subtracted rewards (negative incentives), and the remainder used some combination. Ninety-three percent of the programs rewarded a combination of academics and behavior. The most common academic factors rewarded included completion of work (89% of programs) and attendance (70%), both factors under students' control. The most common behaviors rewarded included good classroom behavior (93% of programs) and good student-student and student-teacher conduct (more than 75%). Corresponding with the social relatedness dimension of motivation, teachers were relied on more heavily than principals and other staff to distribute the rewards. More than half of the schools gave out rewards at least weekly, if not more often. Cash accounted for only 8.5% of all rewards—other rewards included activities, certificates, or special privileges. About 4% of programs contributed to college funds. The most successful systems had near-continuous assessments of behavior, consistently applied rules, strong alignment among school personnel, and rewards for behaviors that were under students' control. In terms of the

programs' effects, Raymond's only finding across systems was a stable and constant positive effect on reading achievement, which occurred across grades (Raymond, 2008).

What Are Some Other Examples of Reward programs?

Countless reward programs have been implemented around the country but never formally studied. Some are districtwide, while others affect only one school or even one classroom. Some programs attempt to change social, civic, or classroom behavior as way to indirectly improve academic achievement, while some more directly target academics.

Many programs have used cash rewards to try to influence students' behavior, paying students for improved tests scores, attendance, or participation in after-school tutoring (Ash, 2008; Miller, 2008; Shaw, 2008). One district offered cash as an incentive for students to put more effort into taking a state standardized test that had no effect on their individual grades but was used for school accountability (Mitchell, 2008). Several states have participated in a pilot program funded by Exxon/Mobil that pays students for earning passing grades on AP exams (Singer-Vine, 2008; Toppo, 2008).

Other programs have used non-cash rewards, such as Pizza Hut certificates or McDonald's Happy Meals, to reward good grades (Elliott, 2007; Wallace, 2009). Some schools have given away iPods, cars, or TVs for good test scores or perfect attendance, often by entering the top-performing students in a raffle to win such prizes (Associated Press, 2011; Toppo, 2008; Viren, 2008; Wallace, 2009). In Brooklyn, a program gave students cell phones and rewarded good behavior, attendance, homework completion, and test scores with cell phone minutes; the phones also enabled students and teachers to communicate about homework and tests (Medina, 2008). At a Virginia public school, students who make the Honor Roll are awarded a "VISA" (Very Important Student Academically) card that entitles them to special privileges like a two-minute early release. The principal says he has witnessed an increase in grades and a social movement that makes it "cool" to be a cardholder, which motivates the desired behavior (Calhoun, 2011).

Charter schools were some of the earliest proponents of comprehensive reward programs, and many have implemented points systems to reward students for good behavior and academic achievements. At KIPP charter schools, students are paid in KIPP dollars, which can be redeemed for rewards that have value to students and change with the student's age, from supplies at the school store to privileges like listening to music during lunch (Raymond, 2008).

As this short list of examples shows, the types of reward program, the behaviors they target, and the rewards they use vary greatly from school to school. More research is needed to determine how these programs affect student behavior and academic achievement.

What Do These Findings Suggest about Rewards as Motivators?

It may seem overwhelming to consider the many types of reward programs that have been proposed or implemented, how they correspond to psychology and scientific theory, and what effects actual programs have had. In addition, people will always disagree about reward programs because of differences in values, philosophies, and theories. Still, by considering findings from evaluations of reward programs and theoretical research on cognition and motivation, we have identified several broad themes to consider when designing and implementing reward programs.

First, research suggests that reward systems can have positive effects on student motivation and achievement. While test gains were made most consistently in reading, some students also improved scores on college entrance exams or other standardized tests. At the same time, these gains were mostly small, and there is little evidence they were sustained over the long-term. Both psychology research and studies of programs highlight an important point, however: these systems only work when implemented thoughtfully, carefully, and within a set of guidelines.

Second, research points to certain characteristics that are associated with more effective and less effective reward programs, including the following:

- Rewarding students for mastering certain skills or demonstrating increased understanding is more likely to foster motivation than rewarding them for reaching a particular performance level or outperforming others.

- Rewards are more likely to be effective if they target behaviors or tasks that students feel are achievable, clearly articulated, and within their control (rather than subject to judgment calls from others).

- The tasks being rewarded should be challenging enough to maintain students' interests, but not so challenging that they could undermine students' feelings of competence.

- Rewarding students to do tasks they inherently enjoy can actually decrease motivation.

- Social rewards and privileges can be effective alternatives to cash rewards if they are sufficiently appealing to students. Some studies suggest that rewards linked directly to academics, such as books, are preferable to cash or non-academic rewards.

- Programs that allow students to choose whether to pursue a reward are more promising than those in which students may feel obligated to participate.

- Rewards are best given promptly enough for students to see a clear link between their behavior and the reward.

- Conditioning students to always expect or become dependent on a reward is less motivating than rewarding them unexpectedly.

- Rewards are more effective if they come from someone of social or personal importance to the study.

Lastly, it is pertinent to consider that the effects of reward programs might vary when applied in different contexts. Research on how different programs affect students from diverse socioeconomic, cultural, or racial/ethnic backgrounds is scarce, as is research comparing the same or similar programs in different contexts. The same program might have a completely different outcome when implemented in a large or smaller school, an elementary or high school, an urban or rural school, or a school with different percentages of low-income or minority children—or, it might not. Simply put, it is important to acknowledge how little we know for certain about how reward programs function, which is all the more reason for conducting more research.

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Center on Education Policy
Graduate School of Education and Human Development
The George Washington University
2140 Pennsylvania Avenue NW
Washington, D.C. 20052
Ph: 202-994-9050
Fax: 202-994-8859
E-mail: cep-dc@cep-dc.org
Web: www.cep-dc.org