Background

Economists often emphasise that "incentives matter".

- Higher financial incentives should lead to more effort and better performance.

This has led to several behavioural interventions based on the application of financial incentives:

- Incentivising students to attend school; reading; better grades.
- Dis-incentivising teacher absenteeism.
- Blood donation
- Quitting smoking
- Exercise.

Background

Today we will look at how extrinsic incentives can clash with other social/personal motivations.

Introducing/changing monetary incentives to do a task may:

- Change how the task is perceived by those targeted by the incentives
  - If incentives are not large enough, this change in perception may lead to undesired effects
- Incentives may work in the short-run, but weaken intrinsic motivations.
  - Hence, when incentives are removed, levels of desired behaviour may fall below pre-intervention levels.

Potential Crowding-Out Effect versus Extrinsic Incentives

Monetary incentivising behaviour X have two types of effects:

1. A direct income effect which makes X more attractive
2. An indirect psychological effect, which may or may not be in opposition to 1.

Bénabou and Tirole (2006) propose a utility function in which three components are valued:

- extrinsic rewards for doing a task
- enjoyment from doing a task
- care about their image vis-à-vis themselves or others
  - based on reputation concerns, and how public their image is

Potential Crowding-Out Effect versus Extrinsic Incentives

This model illustrates some channels through which incentives can affect agents' effort decisions.

1. Information. In a private-good context when the principal is better informed than the agent rewards can signal that:

- the principal views the task as difficult/unattractive
- the principal views the agent as lacking in intrinsic motivation

2. Extrinsic incentives crowding out other motivations.

- Some tasks are associated with higher reputational benefits derived from motives like altruism (e.g. volunteering)
- compensating such tasks at a high value may "devalue" the signal associated with the task
- if the image (de-)motivation is stronger than the price effect, effort could go down if incentives go up

Crowding Out in the Short Run when Incentives Are in Place
Pay Enough—Or Don't Pay At All

Gneezy and Rustichini (2000a) asked University of Haifa students to do a quiz similar to GMAT (50 questions).

- Main treatment variable was piece rate value on correct answer (none, 10 cent, 1 NIS, 3 NIS)

	No payment	10 cents	1 NIS	3 NIS
Mean	28.40*	23.07	34.70***	34.10***
	(13.92)	(14.72)	(8.88)	(9.42)
Median	31	26	37	37

Crowding Out in the Short Run when Incentives Are in Place
Pay Enough—Or Don't Pay At All

Gneezy and Rustichini (2000a) asked Israeli high-school students on a regular charity collection drive.

- Students were told their collection data was to become part of a study (therefore public information);
- Main treatment variable was compensation: none, 1% or 10% of amount collected

	No payment	1%	10%
Mean	238.60*	153.60	219.30***
	(165.77)	(143.15)	(158.09)
Median	200	150	180

Crowding Out in the Short Run when Incentives Are in Place: Large Stakes and Big Mistakes

Gneezy and Rustichini (2000a)'s results suggest that high powered incentives could be the way out.

Ariely et al. (2009) look at the impact of extremely large incentives on performance. They report on two experiments.

Crowding Out in the Short Run when Incentives Are in Place: Large Stakes and Big Mistakes

Experiment 1: sample: 87 residents of a rural town in India.

Task: A series of 6 games, which measure creativity, memory or motor skills

Compensation: treatment variable — Low (2 INR); Medium (20 INR); High (200 INR).

Crowding Out in the Short Run when Incentives Are in Place: Large Stakes and Big Mistakes

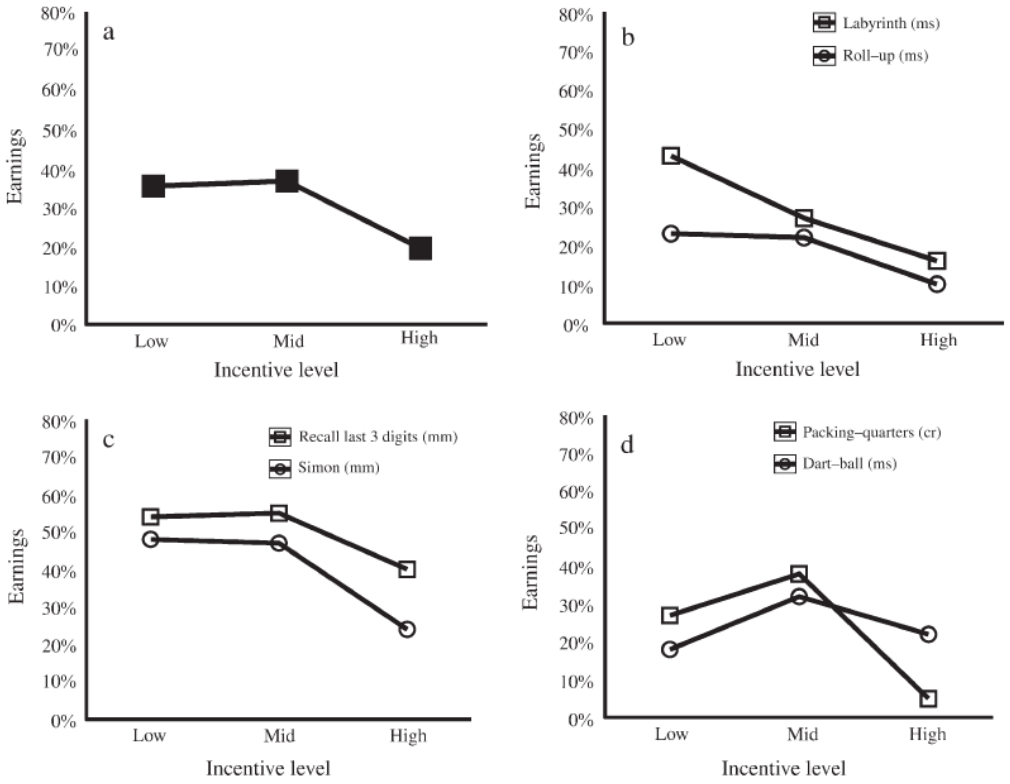

FIGURE 1

Means of the share of earnings relative to the maximum possible earnings for the three payment levels. For all six games combined (a), and plotted separately by game (b–d). Games are indicated by their category: motor skills (ms), memory (mm), and creativity (cr)

Crowding Out in the Short Run when Incentives Are in Place: Large Stakes and Big Mistakes

This experiment had interesting findings:

1. No significant difference in the performance between the low- and mid-payment conditions (exc. Labyrinth).
   - Performance did not go up as a result of higher incentives
   - Perhaps incentives were set at too high a level.
2. Performance was always *lowest* in the high payment condition
3. No obvious difference in the effect of incentives across different games

Two caveats:

1. Unfamiliar task to the subjects
2. Between-subjects design

Crowding Out in the Short Run when Incentives Are in Place: Large Stakes and Big Mistakes

Experiment 2: sample: 24(!) MIT undergraduate students.

Task 1: Very complicated addition task Task 2: Pressing the "v" and "n" keys in a sequence as many times as possible.

Compensation:

- Task 1: \$15 (\$150) if solved at least 10; \$30 (\$300) maximum
- Task 2: \$15 (\$150) if pressed at least 600 times; \$30 (\$300) maximum

Crowding Out in the Short Run when Incentives Are in Place: Large Stakes and Big Mistakes

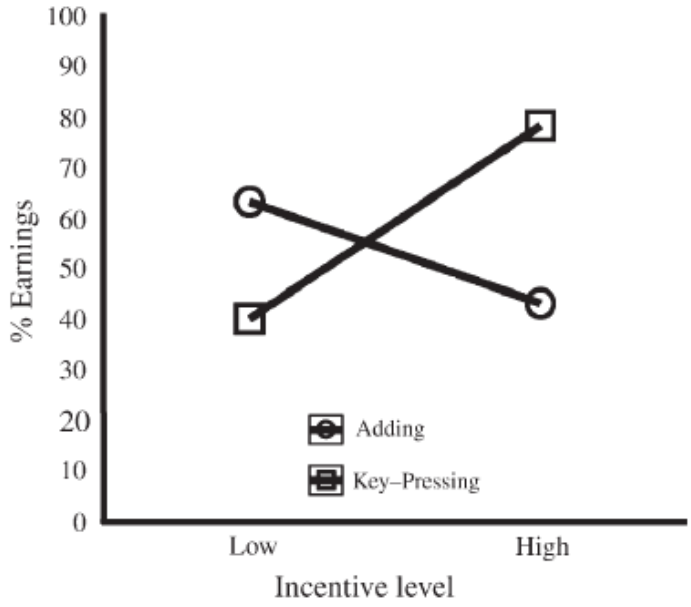

FIGURE 3

Means of the share of earnings relative to the maximum possible earnings for key pressing and adding

Crowding Out after Incentives Are Removed

If incentives signal some form of "bad news," agents who receive incentives will update their beliefs about the task, their own type, or their assessment of their principal.

As a result, their motivation to perform the task without the additional incentive can be reduced permanently.

Meier (2007a) studies the effect of matching donations on charitable contributions

- Matching incentive (a 25 or 50 percent match rate) increases donations in the short run
- Once matching incentives are removed, donations decrease below the pre-incentive period.
- The net effect over time of providing the matching incentive is even negative!

Crowding Out after Incentives Are Removed

Gneezy and Rustichini (2000b) provide an example in which behavior is not just a function of the current incentives, but may be affected by the incentives offered in previous periods.

In their experiment, a daycare began charging late-coming parents a small fine

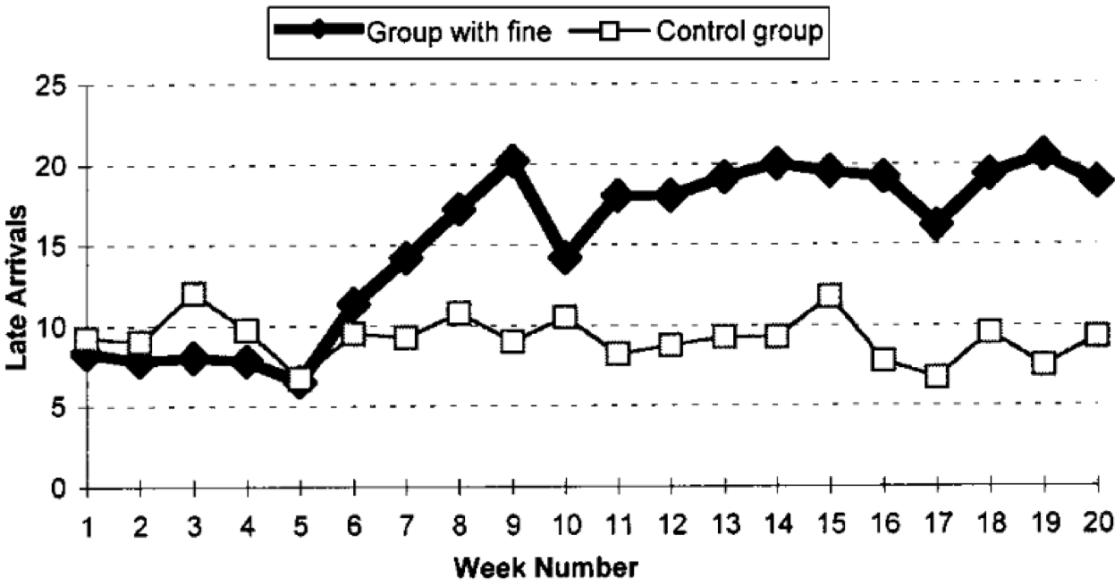

FIGURE 1.—Average number of late-coming parents, per week

Crowding Out after Incentives Are Removed

One interpretation of this result is information:

- Parents did not initially know how important it was to arrive on time.
- The contract specified that they should pick their children up on time but failed to specify the penalty if they did not.
- The distribution of the parents' beliefs regarding how bad it was to be late may have included bad scenarios (for example, "the teacher will make my child suffer").
- Once a small fine was imposed, the contract was complete in that being late was priced.
- The relatively small fine signaled to parents that arriving late was not that important.

Crowding Out after Incentives Are Removed

This new piece of information—that it was not so bad to be late—did not disappear once the fine was removed.

- Even after the fine was removed, parents who had faced the fine were more likely to pick up their children late than were those in the control group.

Once the message has been sent that being on time is not that important, it is hard to revert back.

Incentives in Education

Incentives may seem the ideal tool to increase performance in the classroom.

Students (particularly from disadvantaged backgrounds) may put too little effort in education because

- They overly discount the future
- Have time inconsistent preferences
- Underestimate the returns on education

Incentives can give parents and teachers extra reasons to educate their kids or to ensure their school attendance (Glewwe et al. 2010)

Incentives in Education

This is a sensitive application of incentives.

Critics argue that extrinsic incentives crowd out other underlying reasons for education decisions

Many believe (perhaps rightly) that one of education purposes is to increase the importance of intrinsic motivation for learning!

Incentives in Education: Attendance/Enrolment

Behrman et al. (2005) study the *Oportunidades* programme in Mexico, a Conditional Cash Transfer programme.

- Average amount was $35-40 per month
- Targeted at families that meet eligibility criteria.

To receive a school subsidy, children or youth in participating households have to attend school in one of the subsidy-eligible grade levels (grades 3-12) for at least 85% of school days.

- They also cannot receive a subsidy more than twice for the same grade.

Incentives in Education: Attendance/Enrolment

The way this programme is set up can have unpredictable effects:

- e.g. parents with two children may want send one child 85% of the time and keep the other at home instead of sending both to school 50% of the time

Behrman et al. use data from three groups:

1. eligible households who participated in the programme
2. eligible households who did not participate but lived in intervention areas
3. eligible households who live in non-intervention areas

Incentives in Education: Attendance/Enrolment

Groups 1 and 2 are used to estimate a model of the programme participation decision,

Groups 1 and 3 are used for impact evaluation.

- Group 2 is not used to evaluate impact because of spillover effects onto non-participating households in intervention areas

After 2 years of implementation, the programme led to:

- positive effects on school attainment, enrolment, proportions working and amount of time children spent on homework
- negative effects on the % of children whose parents help them with their homework
  - Adults may have worked more in response to the program, so less time to help kids

Incentives in Education: Attendance/Enrolment

Similar effects found in evaluation of the PACES and *Familias en Acción* programmes in Colombia.

Overall, the effect of the programmes is positive at least in the short-run

1. extrinsic rewards are large and on clear cut objective measure
2. incentives given to the family rather than the child, so may not crowd out intrinsic motivation

Incentives in Education: Academic Achievement

Bettinger (2010) studied direct incentives for higher grades in primary schools in Coshocton, Ohio

- A foundation sponsored a study so that students could receive as much as $100

All students in a given grade at a given school either were eligible for the incentive, or not (at random).

Incentives for higher grades increased math scores (particularly the most apt students) but not those of other subjects, such as reading or social science.

- external incentives might be more effective in concrete subjects, such as primary school math, than in more conceptual topics, such as reading and social sciences.

Incentives in Education: Academic Achievement

Fryer (2010) conducted randomized incentive experiments in public schools in four urban school districts (Chicago, Dallas, NY, and Washington, D.C.) during the 2007-08 and 2008-09 school years.

Incentives applied on education inputs (attendance/good behavior/reading) and outputs (grades). Study varied frequency and level of incentives.

- $6.3M were paid to 38,000 students in 261 schools.

Incentives offered on inputs were more effective than incentives on outputs.

- students may control inputs well, but may not know how to turn effort into higher grades.

Incentives in Education: Variation across Subgroups

It could be that incentives affect different people in different ways.

Angrist and Lavy (2009) look at a RCT in Israeli schools

- Students received a step-by-step series of rewards to complete a high-school diploma (*bagrut*)

Incentives led to higher completion rates and enrolment in tertiary education among girls but not boys.

Incentives in Education: Variation across Subgroups

Leuven et al. (2010) provided incentives to econ and business students at UvA to pass all 1st year requirements within one year.

This had a positive effect in the most able students, but a negative effect on the least able students after 1 year

These effects were magnified after three years, suggesting dynamic spillover effects

Incentives in Education: Overview

Evidence from large-scale field experiments seems to show:

1. incentives work well in increasing attendance and enrollment;
2. incentives have mixed results on effort and achievements;
3. incentives seem to work for some students but not for others.

Incentives and Lifestyle Habits: Smoking

Public policy already attempts to provide some incentives for people not to smoke

- Information about health hazards, no branding on packs, imagery

Further, 70% of smokers report wanting to quit, but only 3% actually do (Volpp et al. 2006)

In the case of smoking the trade-offs are financial and quite salient

- A 20-cig pack costs £7-10 (tesco.com)
- Minimum hourly wage is £5.60-7.50

If you work for minimum wage and smoke a pack a day, you are consuming over 10 percent of your income *now*.

Incentives and Lifestyle Habits: Smoking

The main difficulties for people to stop smoking may be:

- impulsiveness
  - the inability to delay gratification and to withhold a response (Loewenstein, 1987; Laibson, 1997)
- drug-induced euphoria
  - subjective or mood states that correspond to feelings of well-being that are commonly associated with behavioral preferences for drugs (de Wit and Phan, 2009).

To help those who wish to quit overcome these obstacles, two alternative policies have been tried:

- a direct payment for a successful reduction in smoking
- a payment for participation in a cessation program

Incentives and Lifestyle Habits: Smoking

This literature is vast (see Donatelle et al. 2004 for a survey).

Most early studies involved a small number of volunteers. The long-run effects of these programmes are not great.

Volpp et al. (2006) ran an RCT with smokers who were randomised into incentive and non-incentive treatments.

The study combined incentives to participate in a 5-class smoking-cessation programme and incentives to quit smoking

Incentives and Lifestyle Habits: Smoking

The incentive group was offered $20 per class attended and $100 if they quit smoking for 30 days post-completion.

Incentivised participants were more likely to complete the classes than non-incentivised (26 vs. 12%)

Incentivised participants were more likely to quit in the short run than non-incentivised (16 vs. 5%)

After 6 months, quit rates between the treatments were not significantly different (6 vs. 5%)

Incentives and Lifestyle Habits: Exercise

Exercise is another area where standard assumptions about self-control and commitment fail

DellaVigna and Malmendier (2006) analyze a dataset from three U.S. health clubs, over three years

- what contracts each of 7,752 members choose
- their day-to-day attendance decisions

Incentives and Lifestyle Habits: Exercise

The observed consumer behavior is difficult to reconcile with standard preferences and beliefs.

Members who choose a flat monthly fee contract of over $70 attend on average 4.3 times per month.

- They pay a price per expected visit of more than $17
- Even though they could pay $10 per visit using a 10-visit pass
- On average, these users forgo savings of $600 during their membership.

Incentives and Lifestyle Habits: Exercise

Consumers who choose a monthly contract are 17% more likely to stay enrolled beyond one year than users committing for a year.

- Even though monthly members pay higher fees for the option to cancel each month.

It is likely that consumers are overconfident about their future self-control or about their future efficiency.

Overconfident agents overestimate attendance.

Incentives and Lifestyle Habits: Exercise

Charness and Gneezy (2009) conducted field experiments in which university students were offered incentives to attend the university?s gym.

- One group received no incentives
- two other groups were promised $25 to attend the gym at least once during the next week
- All students received literature on the benefits of exercise.

Incentives and Lifestyle Habits: Exercise

The following week, students in one of the incentive groups were promised an additional $100 (paid upon completion) to attend the gym eight more times during the next four weeks.

- The authors were able to observe attendance before, during, and after the intervention.

Requiring people to visit the gym at least eight times significantly improved attendance rates during and, more importantly, *after* the intervention.

- The rise in gym attendance was entirely driven by people who had not been regular attendees.

Incentives and Lifestyle Habits: Exercise

Babcock and Hartman (2010) focus on the social effects of exercise incentives.

They randomly incentivized students to go to the gym.

Prior to the experiment, they elicited a detailed friendship network from the participants, all of whom lived in the same residence hall.

They then looked at how variation in the numbers of treated and untreated peers to which the participant was exposed influenced the effectiveness of the incentives.

Incentives and Lifestyle Habits: Exercise

They find similar results to Charness and Gneezy (2009).

More interestingly, they find evidence of peer effects:

- People on the treated group attended more, the more treated people in their social network .

This demonstrates the importance of social networks in enhancing the effect of incentives for habit change.

In the case of exercise, habit formation seems to be critical. Self-commitment devices like gym memberships may be ineffective.