JA4

Incentives in Schools

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EDUCATION INCENTIVES ON THE RISE

- Lets make schoolwork pay! Interest in secondary-school achievement awards is growing
  - NYC public schools are piloting an ambitious pay-for-performance scheme in elementary and middle schools
  - A plan to pay those who take AP tests is in the works as well; Dallas has already tried this

- Schools and universities have long awarded top performers with scholarship money and prizes
  - Innovation: push awards down to potential under-achievers
  - The scholarship fig leaf is coming off

Growth of Students' Incentive Programs

- Contingent transfers in developing world
  - Mexico Progresa
  - Jamaica PATH
- Merit scholarships for college in US
  - Over a dozen states
  - Georgia HOPE, Arkansas Challenge, Georgia-Hope programs for tuition and scholarships at state schools are multiplying
- New focus on incentives in elementary and secondary schools

And for Perfect Attendance, Johnny Gets... a Car

By PAM BELLUCK

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In Hartford last year, 9-year-old Fernando Vazquez won a raffle for students with perfect attendance and was given the choice of a new Saturn Ion or $10,000. (His parents chose the money.) At Oldham County High School in Buckner, Ky., Krystal Brooks, 19, won a canary yellow Ford Mustang. In Temecula, Calif., the school district prizes can include iPods, DVD players and a trip to Disneyland.

In the Chicago public schools, students with perfect attendance for the first three months of the year are eligible to win $500 worth of groceries or up to $1,000 toward a rent or mortgage payment. Joi Mecks, a spokeswoman for the district, said that for every 1 percent increase in its attendance rate, the district received $18 million more in state money.

Some experts, however, say attendance incentives are a bad approach.

"It's against our grain to suggest that you have to cajole, seduce or trick students in order to get them to learn," said Dr. Jeff Bostic, director of school psychiatry at Massachusetts General Hospital. "And where does it end? Are we going to need to give out a Porsche Boxster? Rather than say we're going to pay you if you show up, we've got to work harder at showing how school really does have relevance to these kids' lives."

Incentives? Bribes?

- Bribery of children is common
  - Teachers give stickers for good behavior
  - Parents give rewards for good report cards
- Low-income parents have fewer bribing resources
  - Weinberg (2001) "An Incentive Model of the Effect of Parental Income on Children"
  - "…parents' ability to mold their children's behavior through pecuniary incentives is limited at low incomes, leading to lower outcomes and increased reliance on non-pecuniary mechanisms such as corporal punishment."
- Incentive programs in schools have potential to compensate for these differences in parental resources

Growth of Teachers' Incentives

- Performance pay for teachers being introduced in many countries, amidst opposition from unions
- Rational: teachers may be motivated by incentive pay

Examples of such recent programs:

- Cities: Denver, Huston, Dallas, Cincinnati, Chicago
- States: Iowa, Arizona, California, Minnesota
- Countries: UK, Mexico, Chile

HOWEVER

There is little evidence on the effect of students' and teachers' incentives at schools

AGENDA

- Presents a 2001 experiment on Student's incentives for *high school achievement and f*ollow up to determine college enrollment up to six years after high school graduation
- A striking result: Girls get it; boys don't

- Presents a 2001 experiment on math and English teachers' incentives based on their high school students' achievements
- Results: improvement in math and English outcomes

JA3

The Effects of High-Stakes High School Achievement Awards on High School and Post-Secondary Schooling

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and

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ACHIEVEMENT AWARDS: Incentives for High-Stakes Testing

- The most important education milestone in Israel is the Bagrut, or matriculation certificate, awarded on the basis of tests in grades 10-12 (mostly 12)
- The Bagrut is required for most PSE and some jobs
- About half of seniors get a Bagrut, but rates are much lower in some schools and groups, especially rural, predominantly AA, immigrant, and Arab
- In an effort to increase Bagrut rates, we tried demonstration projects that offered cash incentives for low-SES pupils to take and pass Bagrut exams

DESIGN OF THE INTERVENTION

- HS Seniors graduating in 2001 received NIS 6,000 (US $1,500) when awarded a Bagrut
- A school-based GRT: We identified 40 schools with low 1999 Bagrut rates, but above 3%. Treatment randomly assigned to all students in 20 schools
  - Schools were paired on the basis of their 1999 Bagrut rates, with one treatment school in each pair to improve T-C balance
  - Sample included 10 Arab schools and 10 religious schools; 5 treated schools are *non-compliers*
- Data from 2000 and 2002 are used as a check since GRT did not balance T & C perfectly

High School effects on treated subjects

	Boys		Girls		Girls	
	Top	Bottom	Top	Bottom	3rd Quartile	4th Quartile
Effect	-0.012	0.009	0.139	-0.016	0.038	0.152
Mean	0.390	0.047	0.539	0.082	0.370	0.618

ACHIEVEMENT AWARDS RESULTS

- No effects on boys; clear effects on girls
- Why girls?
  - No difference in the likelihood of being in the “marginal group”
  - No difference in program awareness
  - A possible proximate cause: girls were more likely to participate in pre-exam “study marathons” (.30 G vs. .19 B), and the effect of treatment on participation for marginal girls is sig.

POST-SECONDARY RESULTS

- PSE outcomes:
  - Universities (“research institutions”)
  - All academic (universities plus academic colleges)
  - Academic + teachers colleges + practical engineering schools (includes, e.g., programming and systems-related)
- Where to look?
  - We focus on girls, and look at results using the same upper/lower lagged-score breakdown
  - Results by lagged-score halves and quartiles
- Results:
  - Upper quartile girls do better on academic enrollment
  - Upper half girls do better on all-inclusive enrollment

Post Secondary schooling effects on treated subjects

	Boys		Girls		Girls	
	Top	Bottom	Top	Bottom	3rd Quartile	4th Quartile
Effect	-0.028	-0.012.	0.081	0.036	0.128	0.047
Mean	0.252	0.081	0.331	0.099	0.429	0.236

University schooling effects on treated subjects

	Boys		Girls		Girls	
	Top	Bottom	Top	Bottom	3rd Quartile	4th Quartile
Effect	0.019	0.004.	-0.021	0.014	0.012	-0.034
Mean	0.064	0.003	0.069	0.011	0.112	0.027

Bottom Line

- The important results are
  - Short-term incentives have long-term effects
  - Girls respond more than boys to incentives

- Opens up new set of questions
  - Do the positive effects of incentives to learn persist into the labor market?
  - Why do girls respond so much more strongly to incentives to learn?

CONCLUSIONS

- Achievement incentives may work . . . but its not as easy as we thought it would be!
- Like interventions designed to boost skills in the labor market, the overall impact is modest, though effects can be large for some groups
- Better targeting, earlier and more attainable awards seem likely to give a bigger boost
- Girls shifted study effort, with consequent success; boys appear to have ignored the program
- First evidence of a longer-term PSE payoff from a high school award scheme

Performance Pay and Teachers' Effort, Productivity and Grading Ethics

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Design Challenges

- How should performance be measured?
- Absolute/Relative P-measures?
- Individual teachers' versus group contributions?
- How should the rewards be structured and how generous should they be?
- Spillover effects / externalities of incentives?
- Teaching to the test? Real Human capital accumulation?

The Intervention

An individual performance bonus paid to teachers on the basis of their own students' achievements:

-- English, Hebrew/Arabic, Mathematics teachers

-- Teaching in advance of matriculation exams

-- Structure: rank order tournaments

-- Multiple tournament entry, ranked each time

-- Ranking criterions: passing rate and mean score

-- Ranking base: actual outcome - predicted outcome

-- All teachers who had a positive residual in both

The Intervention

Outcomes were divided into four ranking groups

	A/score	P/rate	T/points
First	16	20	36
Second	12	15	27
Third	8	10	18
Fourth	4	5	9

The Intervention

Prizes:

30–36 points —$7,500

21–29 points—$5,750

10–20 points—$3,500

9 points—$1,750

The Intervention

Participants: 629 (E-207, M-237, H/A-148, O-37)

Awards: 302 (E-94, M-124, H/A-67, O- 17)

Survey Results:

92% percent knew about the program

70% were familiar with the award criteria

60% thought they would win awards

30% percent d/not believe they would win

The Experimental Design

- 97 eligible schools selected based on:

  Being a comprehensive school (7 - 12)

  Poor performance in math and English

- 49 chosen for treatment out of 97 eligible
- Assignment rules of eligible to treatment:

  Jewish secular: matriculation rate <= 45%

  Other schools: matriculation rate <= 43%
- Schools allowed to replace Hebrew and Arabic

  with other subjects: Bible, literature, or civil studies

Key Questions Addressed

- Did the teachers exert more effort?

  Improve preparation and teaching?

  Evaluate more effectively need for additional instructional assistance?
- Did the students' outcomes improve?
- Spillover effects in untreated subjects?
- The overall effect of the program?
- Cost effectiveness versus other interventions

Evaluation Strategy

- Non-random selection of schools
- Evaluation of English and math only
- Potential spillover effects on un-rewarded subjects

Therefore:

- Estimates effect on untreated subjects
- Overall effect, evidence on matriculation status
- Measured outcome in each subject:

# of tests, #credits attempted, #credits earned

Effects on treated subjects

	Testing rate		**Passing rate**		**Score**	
	Math	English	Math	English	Math	English
Full sample	0.041	0.033	0.087	0.039	5.307	2.527
Mean	0.802	0.865	0.637	0.795	55.05	59.50
2ed quartile	0.077	0.063	0.180	0.090	13.07	57.52
Mean	0.815	0.903	0.503	0.777	46.92	59.60
Unconditional effect	-		63%	37%	58%	24%

Additional Results

Who are the successful teachers?

Teachers' ranking in tournament is not correlated with teachers' characteristics: gender, age, experience, education

Teachers' behavioural changes observed?

Effort: significant additional after school instruction

more intensive after school preparation before exam

Teaching methods: more individualized instruction,

more tracking by ability,

adapting t-methods to students ability

Conclusions

✓ PRP incentives can align interests of teachers with interests of system w/o necessarily inducting distortions

✓ This is despite the concern about team nature of teaching

✓ Caveat: not much yet known about the long run effects

✓ Important result: real learning outcome have improved

✓ The structure of the Israeli matriculation-exam system closely resembles corresponding systems in France, Germany, Mass, NY and other countries

✓ The experiment has much in common with performance-pay initiatives being tested in other countries.

✓ So lessons are relevant beyond the Israeli context

Benefit and Cost Comparison

✓ The teacher incentive program (Lavy 2007):

Cost $170 per student - a 2% increase MR, from 42% to 44.1%

✓Student bonuses (Angrist and Lavy; 2007):

Cost $300 per student - a 6–8% increase in MR, from 19% to 26%

✓School incentives (Lavy; 2002): Cost $270 per student - 1% increase in MR, from about 45% to 46%

✓Targeted Instruction Time (Lavy and Scholser, 2005)

Cost of $1,100 per student – a 11% increase in MR, from 33% to 43%

*** MR – Matriculation rate