

No margin, no mission?

A Field Experiment on Incentives in the Social Sector

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(with Nava Ashraf and Kelsey Jack)

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Answer is key to:

- ▶ understanding observed behavior
- ▶ designing incentives that align the individuals' interests with those of the organization they work for

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Literature focuses on financial incentives in the private sector

Lessons might not apply to the social sector

The “social sector”

Public or private organizations (NGO, charities etc) that share the following features:

- ▶ value or mission driven
- ▶ pursue goals with positive externalities
- ▶ produce “social” value
- ▶ reinvest profits (if any) into the mission

Typically match with workers that share interest in the mission
[Besley and Ghatak 2005]

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Applying the same recipe to social organizations raises two issues:

- ▶ financial incentives might crowd out intrinsic motivation [Bénabou and Tirole 2003, 2006]
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Need an alternative reward scheme

- ▶ to give a non-monetary stake in success
- ▶ to leverage intrinsic motivation

This study

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First (developing country) field evidence on:

- ▶ the effect of financial incentives in a social organization
- ▶ the practical relevance of motivation crowding out [Titmuss 1970, Gneezy and Rustichini 2000, Ariely et al 2009]
- ▶ the effect of symbolic rewards/ social recognition on effort [Eriksson and Villeval 2010, Kosfeld and Neckermann 2010]
- ▶ the effect of incentives on agents selection [Lazear 2000, Lazear et al 2006, Bandiera et al 2007, Eriksson and Villeval 2008]

Plan of the talk

- ▶ Basic theoretical framework
- ▶ Context
- ▶ Experimental design
- ▶ Preliminary findings

Basic framework

The organization hires a worker to produce social “output” $Y(e)$. e is effort, non-observable, $Y(e)$ is an imperfect signal, $Y'(e) > 0$

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 - ▶ where σ_i is the weight worker i gives to social output, $c(m)$ captures the possibility of motivation crowding-out $c' < 0$
 - ▶ reduced form of many social preferences: pure altruism, reputation etc

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 - ▶ reduced form of many social preferences: pure altruism, reputation etc
- ▶ disutility of effort $d(e)$, $d' > 0$, $d'' > 0$

Monetary incentives and effort choice

For given workers' characteristics (ϕ_i, σ_i)

► FOC/IC: $[\phi_i m + \sigma_i c(m)] Y' = d' \Rightarrow e(m)$

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Given the agent's type, the principal $\max_m Y(e^*(m))(1 - m)$

- ▶ Note $\frac{de^*}{dm} = \frac{Y'}{-\Delta}(\phi_i + \sigma_i c')$ i.e. for c' or σ_i sufficiently large or ϕ_i sufficiently small, financial incentives can backfire

Non-monetary incentives and effort choice

If the principal could increase the agents' utility from non-monetary payoff- e.g. by offering social recognition r as function of the agents' performance

- ▶ $\frac{de^*}{dr} = \frac{Y'}{-\Delta}(\sigma_i r c) > 0$, i.e. non-financial incentives increase effort, but size of the effect depend on agent's type σ_i
- ▶ implicitly assume that non-financial incentives cannot crowd out financial motivation...

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Note: heterogeneous response to incentives: high ϕ_i types respond more to m , high σ_i types respond more to r

Selection

Composition of the workforce is endogenous

Choice of (m,r) affects the composition of the workforce in equilibrium

Exact solution depends on market structure- not necessary to solve here

Experiment goals

1. Test whether different incentive schemes attract different “types” of agents (unusually rich data- we have information on all potential candidates)
2. Design and evaluate one possible way to increase r , i.e. increase the sensitivity of the non-monetary payoff to effort
3. Compare the effectiveness of r with selected financial incentives
4. Test whether financial incentives crowd out “intrinsic” motivation

Field experiment context

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Agents' task: distribute female condoms in urban compounds

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Agents: hairdressers and barbers

- ▶ Thousands of salons, found in all neighborhoods
- ▶ Good client relationships (key for targeting)
- ▶ Clients are “captive” while getting hair done – good for information provision
- ▶ 42% of our sample stylists talk to clients about HIV at the baseline

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Characteristic of many social sector programs:

- ▶ teachers for deworming
- ▶ community members for health products

Stages and data

- ▶ Census: Survey all salons in Lusaka (~2500)
- ▶ Randomly assign 1200 salons to four treatments
- ▶ Invite to training, collect further information + experimental game to measure “intrinsic motivation”
- ▶ Sales and monitoring (SFH restocking data + promoters' logbooks): collect monthly for one year
- ▶ Endline: Resurvey all census salons
- ▶ Customer surveys (~2000 individuals, from 16 marketplaces)

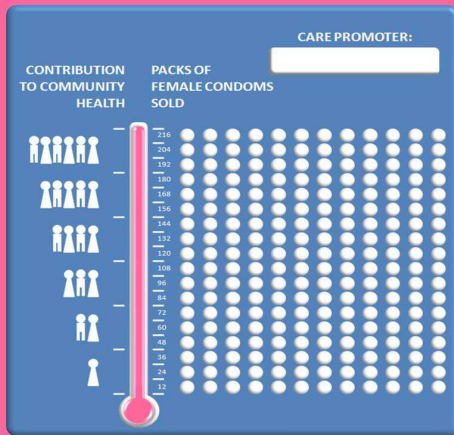
Incentives

All stylists sell at the same price (K500/pack), restock from SFH
Each dispenser contains 12 packs of 2 condoms each
Incentives calculated monthly for number of packs sold

Pure volunteer (PVT)	no reward
Low powered financial (LPFT)	K50/pack (10% margin)
High powered financial (HPFT)	K450/pack (90% margin)
Symbolic rewards (ST)	chart marking sales with stars public ceremony after threshold

Wall Thermometer

For lovers
who choose to *Care!*



Manipulating r

Tie reward (stars) to sales effort (# stars proportional to social value)

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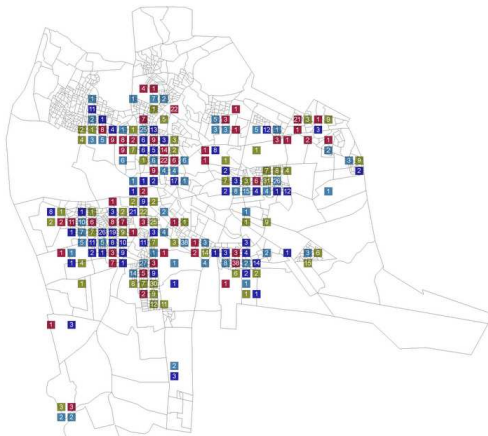
Can affect non-monetary payoff in a variety of ways:

- ▶ Warm glow (remind self)
- ▶ Reputation (make contribution visible)
- ▶ Relative status concern (allow social comparison with other promoters)

Randomization

- ▶ Assign treatment based on gridcell location via GPS coordinates of salons
- ▶ Buffer between any 2 salons in different treatments (150m)
- ▶ ~200 gridcells, 500sqm each, with an average of 14 salons/gridcell
- ▶ Stratified on type of salon, presence of bar, manager's assets, index of altruism, number of employees, number of products sold
- ▶ Announced to stylists AFTER training, but BEFORE they decide to join

Randomization



Randomization balance and attrition

Treatment was assigned at the census stage

2 points where attrition could occur:

- ▶ Stylists assigned to receive training invitations did not receive them
- ▶ Stylists who received training invitations did not attend the training

Treatment was not revealed until training stage: re-test balance for trained salons

No differential attrition by treatment

	Received invitation		Attended training	
	Conditional on assigned to program		Conditional on received invitation	
High powered financial treatment	-0.005 [0.033]	-0.006 [0.029]	0.016 [0.042]	0.016 [0.041]
Low powered financial treatment	0.029 [0.034]	0.031 [0.031]	-0.023 [0.042]	-0.012 [0.040]
Symbolic rewards treatment	-0.006 [0.031]	0.003 [0.030]	-0.042 [0.046]	-0.031 [0.046]
Constant	0.799* [0.021]	0.706*** [0.051]	0.797** [0.032]	0.713*** [0.067]
Controls		yes		yes
Observations	1222	1217	981	978

Balance at training

Randomization balance at training

Table: Stratification and control variable means and standard deviations.

	High financial	Low financial	Volunteer	Stars	Max Delta
Stratification variables					
Hair salon	0.518 [0.501]	0.527 [0.501]	0.476 [0.501]	0.416 [0.494]	0.158
Barbershop	0.424 [0.496]	0.412 [0.494]	0.481 [0.501]	0.427 [0.496]	0.098
Near a bar (0/1)	0.921 [0.270]	0.863 [0.345]	0.854 [0.354]	0.897 [0.304]	0.151
Low assets index (bottom quartile)	0.215 [0.412]	0.220 [0.415]	0.203 [0.403]	0.184 [0.388]	0.063
Number of employees	1.733 [0.893]	1.713 [0.820]	1.703 [0.904]	1.881 (1.271)	0.114
Dictator game donation above median	0.600 [0.491]	0.552 [0.499]	0.597 [0.492]	0.587 [0.494]	0.068
Sells other products in salon	0.241 [0.429]	0.280 [0.450]	0.311 [0.464]	0.259 [0.440]	0.112
Gridcell population (density)	16.53 (12.84)	15.32 (11.99)	14.53 (10.30)	11.91 (7.051)	0.315
Other controls					
Low socioeconomic status (0/1)	0.204 [0.404]	0.236 [0.426]	0.142 [0.349]	0.200 [0.401]	0.172
Roman Catholic (0/1)	0.236 [0.425]	0.214 [0.411]	0.226 [0.420]	0.254 [0.437]	0.066
Married (0/1)	0.539 [0.500]	0.495 [0.501]	0.566 [0.497]	0.525 [0.500]	0.101
Motivated by profit	0.366 [0.483]	0.324 [0.469]	0.264 [0.442]	0.438 [0.497]	0.261

Max Delta is the maximum pairwise standard normal difference.

Spillovers: design features

- ▶ Stylists on different treatments are trained on different days
- ▶ Staff who distributes invitations does not know that treatments differ on different invitation days
- ▶ Incentive treatments are equivalent to an outside observer (same price) - eliminates the risk that customers spread information about different treatments
- ▶ Buffers place untreated salons between different treatment groups

Spillovers: evidence

- ▶ Collect data on friendship/family links between all stylists in the census
- ▶ At baseline, median hairstylist reports only one other hairstylist in the city as either relative, friend or acquaintance
- ▶ We monitor how this changed every month throughout the year
 - ▶ between 60% and 80% of stylists report meeting a new stylist in the first four months of treatment- this is the same across treatments
 - ▶ very few report meeting stylists after the 4th month
 - ▶ over 90% of the new acquaintances are met at training- hence receive the same treatment
- ▶ We ask our surveyors to record all comments/ complaints stylists might have every month
 - ▶ nobody complained about different margins

Test 1: Selection

- ▶ Do different incentives attract different types?
- ▶ 97 percent of trained stylists joined the program

$$y_{ic} = X_i\beta_i + \sum_{j=1}^4 \delta_{0j} \text{treat}_{jc} + \sum_{j=1}^4 \delta_{1j} \text{treat}_{jc} * x_i + u_{ic}$$

- ▶ y_i = joined program (conditional on attended training)
- ▶ X_i = all stratification and control variables

Finding 1: Treatment does not affect selection

- ▶ 97% of agents invited to training joined the program
- ▶ Only 5% left during the following year
- ▶ Both are equally distributed by treatment
- ▶ In this setting, different incentives did not attract different types
- ▶ This might be due to the fact that this is not their main occupation – only a small side activity

Female condom sales

Over 12 months, 15,661 female condoms distributed

Total packs stocked	
High powered financial treatment	3614
Low powered financial treatment	3418
Pure volunteer treatment	3875
Stars treatment	4754
Total	15661

- ▶ outcome measure is restocking

Test 2: Comparison of incentive treatments

Do incentives significantly affect restocking?

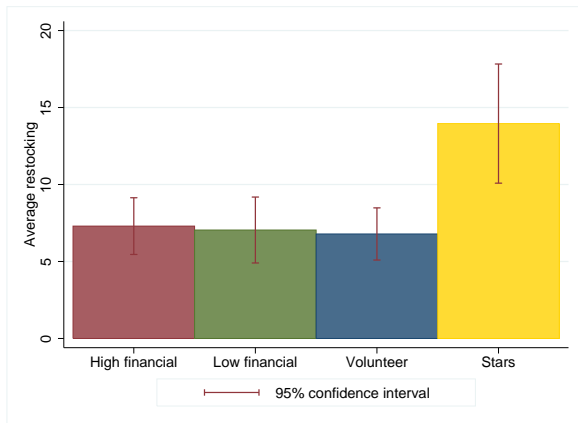
- ▶ Cross section: total restocking

$$y_{ic} = \sum_{j=1}^4 \delta_j \text{treat}_{jc} + X_i \beta + u_{ic}$$

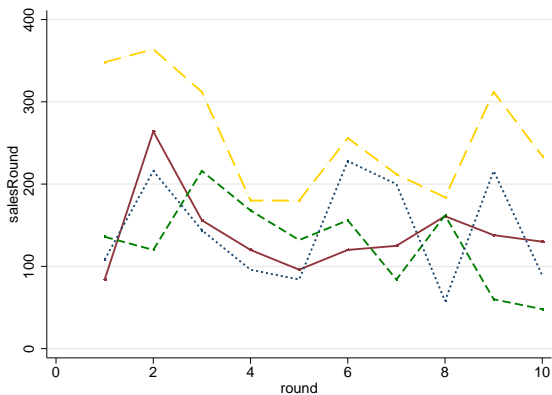
- ▶ Panel: restocking by monitoring round

$$y_{ict} = \sum_{j=1}^4 \delta_j \text{treat}_{jc} + X_i \beta + u_{ict}$$

Test 2: Unconditional sales by treatment



Test 2: Sales by treatment over time



Test 2: Comparison of incentive treatments

Dependent variable is packs restocked			
	(1)	(2)	(3)
High powered financial treatment	0.511	0.928	0.981
	[1.622]	[1.644]	[1.695]
Low powered financial treatment	0.256	0.712	0.816
	[1.527]	[1.550]	[1.554]
Symbolic rewards treatment	7.169***	7.250***	7.298***
	[2.437]	[2.584]	[2.528]
<i>Stratification variables</i>			
Barbershop		3.126*	3.165*
		[1.556]	[1.568]
Mixed (barber and hair salon)		3.208	3.347
		[3.848]	[3.860]
Near a bar (0/1)		0.691	0.616
		[1.999]	[2.041]
Low assets index (bottom quartile)		0.808	0.964
		[1.660]	[1.698]
Number of employees (log)		1.57	1.593
		[2.651]	[2.630]
Dictator game donation above median		2.999**	2.970**
		[1.116]	[1.114]
Sells other products in salon		5.001**	5.245**
		[1.721]	[1.719]
Gridcell population (log)		-0.224	-0.199
		[0.922]	[0.935]
<i>Other controls</i>			
Low socioeconomic status (0/1)			-1.17
			[1.373]
Roman Catholic (0/1)			-3.563**
			[1.314]
Married (0/1)			1.548
			[1.233]
Motivated by profit			1.024
			[1.349]
Mean of packs restocked	8.70	8.75	8.75
Observations	770	764	764

Finding 2: Non-financial rewards are most effective

In this context non-financial rewards are more effective than financial incentives

- ▶ the difference is statistically and economically significant

Robust to the inclusion of a rich set of salon and agent characteristics

Driven by variation on the intensive margin

Two possible interpretations:

- ▶ Financial incentives backfire
- ▶ Financial incentives are just less powerful

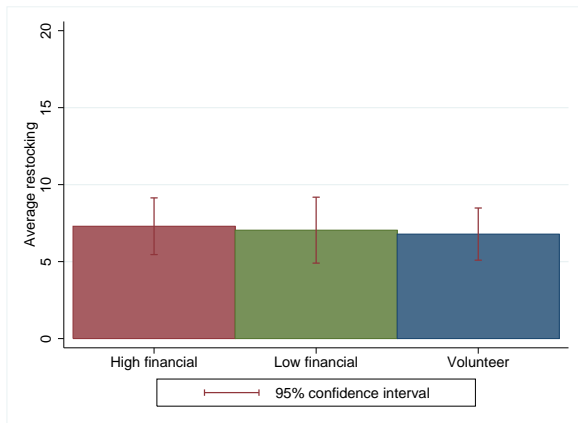
Test 3.1 Motivation crowding out

Step 1: Compare volunteer to different high and low powered financial incentives

“Standard” test, relies on the assumption that any level of financial incentive crowds out motivation

$$y_{ic} = \sum_{j=1}^3 \delta_j \text{treat}_{jc} + X_i \beta + u_{ic}$$

Finding 3.1: No motivation crowding out



- ▶ No significant different between financial incentives and volunteer treatments
 - ▶ Robust to controls

Test 3.2 Motivation crowding out

Is there any motivation to crowd out?

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Use donations in the dictator game as proxy for intrinsic motivation

Donation significantly predicts restocking

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- ▶ there is motivation to be crowded out

Do incentives differentially affect effort for agents with greater intrinsic motivation for the cause (high σ_i)?

- ▶ interact treatments with measure of σ_i

Finding 3: No crowding out

<u>Dependent variable is packs restocked</u>	
High donation (above median)	1.037 [1.509]
High financial treatment for low donation (=0)	-1.807 [1.549]
Low financial treatment for low donation (=0)	1.359 [1.860]
High financial treatment for high donation (=1)	2.866 [2.424]
Low financial treatment for high donation (=1)	0.231 [1.944]
Controls	yes
Mean of packs restocked	8.75
Observations	764

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Financial incentives do not crowd out intrinsic motivation in our setting

Stars reinforce intrinsic motivation: most effective for high donation (high σ_i)

Test 4: Do financial incentives work for high ϕ_i s?

Do financial incentives have a differential effect for agents

- ▶ with better sales skills (sell other products)?
- ▶ with stronger profit motives (“in it for the money”)?
- ▶ with higher marginal value of money (low assets, lower socioeconomic status)?

Test 4: Do financial incentives work for high ϕ_i s?

Dependent variable is packs restocked

Interaction variable	Sells other products	For-profit motive	Low socioeconomic status	Low assets (bottom quartile)
Interaction variable (I)	3.650*	2.305	-4.142***	1.751
	[2.160]	[2.099]	[1.562]	[2.717]
High financial treatment for I=0	1.461	1.742	0.587	1.12
	[1.686]	[2.026]	[2.013]	[1.678]
Low financial treatment for I=0	0.705	0.493	-0.004	0.442
	[1.630]	[1.796]	[1.721]	[1.702]
Stars treatment for I=0	4.882**	8.401***	6.686**	8.137***
	[2.103]	[2.578]	[2.837]	[2.968]
High financial treatment for I=1	-1.247	-0.718	3.441*	0.377
	[3.115]	[2.533]	[1.8]	[3.716]
Low financial treatment for I=1	0.856	1.229	4.606	1.991
	[3.174]	[3.115]	[2.894]	[3.801]
Stars treatment for I=1	14.1**	5.381	10.57***	3.702
	[5.781]	[4.204]	[3.168]	[3.463]
Controls			yes	
Mean of packs restocked			8.75	
Observations			764	

Finding 4: Value of money matters

- ▶ Sales skills

- ▶ financial incentives are not more effective for promoters who sell other products
- ▶ non-financial incentives are significantly more effective

- ▶ For-profit motivation

- ▶ financial incentives are not more effective for promoters who are “motivated by profit”

Finding 4: Value of money matters

- ▶ Sales skills
 - ▶ financial incentives are not more effective for promoters who sell other products
 - ▶ non-financial incentives are significantly more effective
- ▶ For-profit motivation
 - ▶ financial incentives are not more effective for promoters who are “motivated by profit”
- ▶ Value of money
 - ▶ financial incentives are effective for low socioeconomic status, but stars are even more effective
 - ▶ no interaction with value of assets (very noisy measure)

Exploring mechanisms

- ▶ Warm glow: stars leverage intrinsic motivation
- ▶ Social comparison/ “race” with other stylists
- ▶ Reputation with the general public –later

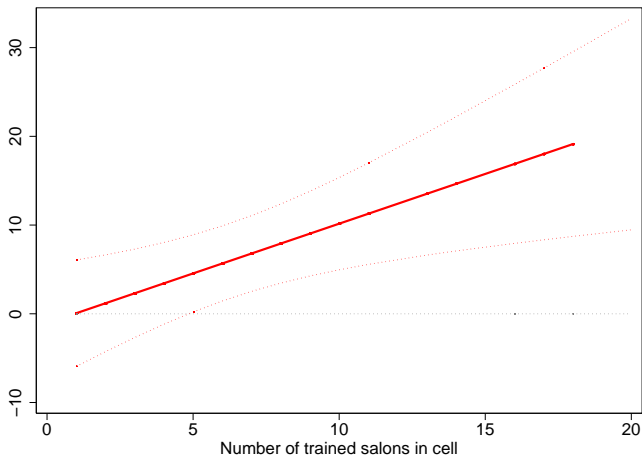
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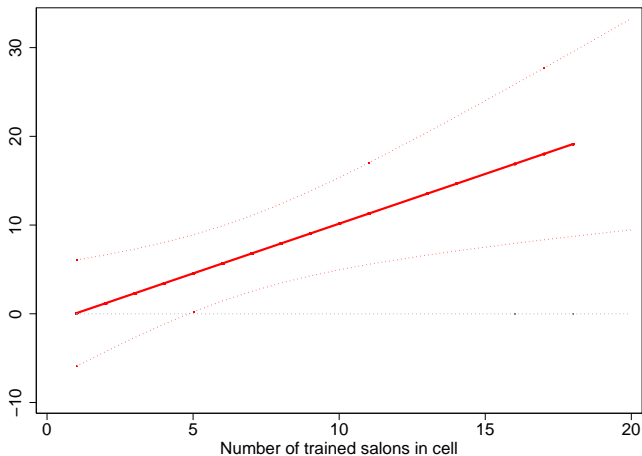
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Stars treatment for low donation (=0)	4.641 [2.898]
Stars treatment for high donation (=1)	9.204*** [3.179]
Controls	yes
Mean of packs restocked	8.75
Observations	764

- ▶ Stars are twice as effective for motivated promoters

Evidence: Social comparison

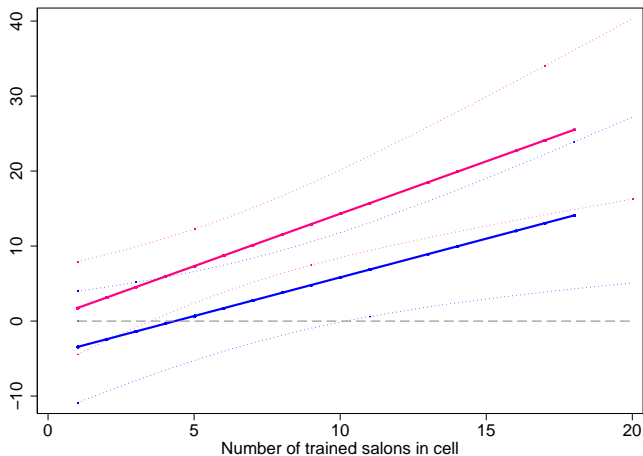


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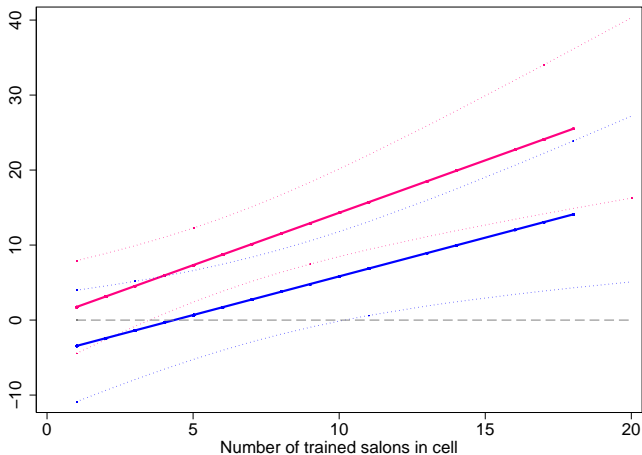


- ▶ The effect of stars is larger when there are more promoters in the same cell
- ▶ Other treatments (not shown) are equally ineffective

Evidence: Social comparison and warm glow



Evidence: Social comparison and warm glow



- ▶ both effects are at play
- ▶ but motivated promoters also sell in low density cells

Alternative explanations

Stars may be effective for reasons that have little to do with intrinsic motivation for the cause

- ▶ thermometer has an advertising effect: sales are higher because demand is higher
- ▶ money is divisible/private, stars are non divisible/public: sales are higher because more stylists within the same salon can be motivated at the same time

Stars might increase quantity at the expense of quality

- ▶ stylists in the stars treatment might target “easy sales” (male condom users) with low health impact

Advertising effect: Customer survey

Survey of ~2000 customers in markets containing salons in our sample

- ▶ conditional on visiting a salon in market

Only 11 remember seeing the thermometer

- ▶ the effect of seeing any advertisement on the likelihood of ever having used a female condom does not vary by treatment

Advertising effect: Poster experiment

Distributed a “placebo thermometer” to a random sample of financial treatment and volunteer salons

- ▶ stars represent average sales for **all** salons
- ▶ all other salons receive a generic poster
- ▶ measure subsequent period sales for placebo treatment and poster control salons

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Dependent variable is packs sold in round following placebo treatment

Placebo thermometer	-0.271 [0.317]	-0.323 [0.287]
Controls		yes
Mean of packs sold	1.13	1.12
Observations	251	250

Incentive divisibility

- ▶ Financial incentives are paid to the owner/manager and can be shared with other stylists in the salon
- ▶ Stars are posted on the wall of the salon and cannot be attributed to individual stylists (but owner's name is on it)
 - ▶ might underestimate the effect of stars if stylists free ride
 - ▶ might overestimate it if stars are a pure public good

Incentive divisibility

- ▶ Financial incentives are paid to the owner/manager and can be shared with other stylists in the salon
- ▶ Stars are posted on the wall of the salon and cannot be attributed to individual stylists (but owner's name is on it)
 - ▶ might underestimate the effect of stars if stylists free ride
 - ▶ might overestimate it if stars are a pure public good
- ▶ In our sample 50% of salons have one stylist, and only 4% have more than three
- ▶ Effect of stars (and other treatments) is identical in one- and multi- stylists salons
- ▶ Divisibility issue might have been relevant had salons been larger

Targeting

Salons in program kept a logbook of sales

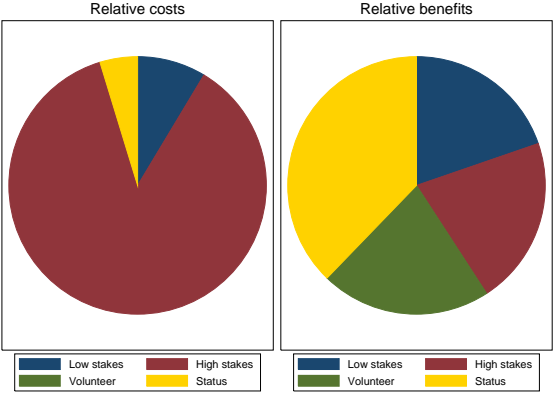
- ▶ record customer's gender, age, multiple partners, first female condom, male condom user, in a committed relationship
- ▶ data is recorded by the stylist (might not be very reliable)

No evidence of differential targeting of male condom users by stars treatment salons

Summary

- ▶ Stars (non-financial rewards) are much more effective than financial incentives in this setting
- ▶ Difference on the intensive margin
- ▶ No evidence that different incentives attract different types
- ▶ No evidence that financial incentives crowd out intrinsic motivation and reduce performance

Cost-benefit calculation



External validity

Comparison of very specific schemes:

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No crowding out:

- ▶ Very cash poor, no negative reputational effects for accepting payments

Identifying pro-social types: Donation game

“We have recently received additional money for today’s training. As a consequence we have sufficient funds to give each of you an additional K12500.

You can choose how much of this sum to keep for yourselves and how much to donate to project X, a project that works with youth on HIV prevention in Lusaka.

If you wish to donate, please put your donation in the envelope provided with this form [form has pre-printed ID number on it] and drop it in the collection box. Note that the amount you donate is totally up to you: you can give nothing, part of the K12500, or the entire thing. The amount you contribute will be kept completely confidential. We will give you a few minutes to think about it. When you’ve taken a decision, please drop your envelope in the box at the front.”

Attrition 1

Table: Randomization balance for invitation delivery

	(1)	(2)
High financial	-0.005 [0.033]	-0.007 [0.030]
Low financial	0.029 [0.034]	0.03 [0.031]
Stars	-0.006 [0.031]	0.004 [0.030]
<i>Stratification variables</i>		
Barbershop		0.062* [0.028]
Near a bar (0/1)		0.018 [0.036]
Low assets index (bottom quartile)		-0.055 [0.033]
Give to HIV causes		0.025 [0.025]
Number of employees (normalized)		-0.003 [0.016]
Sells other products in salon		0.02 [0.025]
Gridcell population (density)		0.003** [0.001]
<i>Control variables</i>		
Low socioeconomic status (0/1)		0.007 [0.025]
Roman Catholic (0/1)		0.014 [0.024]
Married (0/1)		0.056* [0.024]
Motivated by profit		-0.047 [0.027]
Constant	0.799*** [0.021]	0.695*** [0.044]
Observations	1222	1216

Attrition 2

Table: Randomization balance for attending training (conditional on receiving invitation)

	(1)	(2)
High financial	0.016 [0.042]	0.014 [0.041]
Low financial	-0.023 [0.042]	-0.014 [0.040]
Stars	-0.042 [0.046]	-0.029 [0.046]
<i>Stratification variables</i>		
Barbershop		0.058 [0.033]
Near a bar (0/1)		0.065 [0.048]
Low assets index (bottom quartile)		-0.008 [0.037]
Give to HIV causes		0.049 [0.026]
Number of employees (normalized)		-0.017 [0.018]
Sells other products in salon		-0.003 [0.032]
Gridcell population (density)		0.002 [0.001]
<i>Control variables</i>		
Low socioeconomic status (0/1)		-0.069 [0.036]
Roman Catholic (0/1)		0.023 [0.026]
Married (0/1)		0.022 [0.024]