

# **Dictator games in the lab and in nature: Evidence of external validity from Ugandan primary schools**

by

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# Introduction

- **Focus:** Teacher absenteeism is a significant problem in publicly funded schools throughout the developing world
- **Aim:** to establish whether a Dictator Game can be used simultaneously
  - as a baseline in a series of laboratory experiments designed to investigate what would happen if Ugandan school management committees (SMCs) were empowered to hold teachers to account
  - to generate a measure of teachers' intrinsic motivations
- **Specifics:** Test and investigate the external validity of the DG
- **Why the DG?**

It appeared to be a good match for the status quo in Ugandan schools

# Introduction

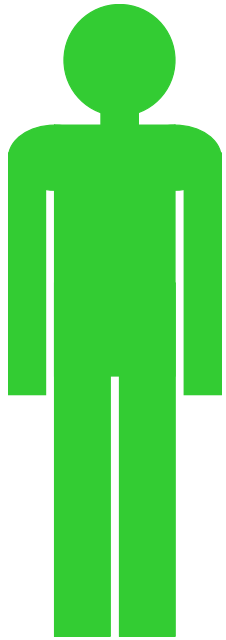
- **Focus:** Teacher absenteeism is a significant problem in publicly funded schools throughout the developing world

## A characterization of the status quo

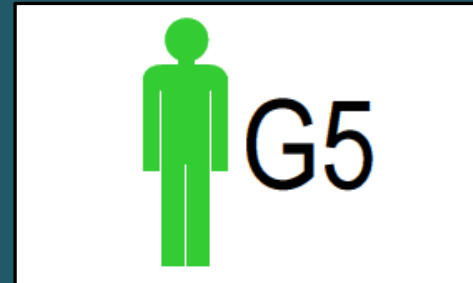
- Teachers sell a contracted amount of time to the government each month
- The government gives back this time and sends them off to remote communities to use the time to teach
- The teachers are not monitored => their contracts are not enforced => they are free to choose how much time to allocate to teaching and how much to themselves
- **This looks like a Dictator Game:** the teachers are the dictators; the communities are the recipients; the currency is the teachers' time; and the size of the stake is specified in the contract

# Design

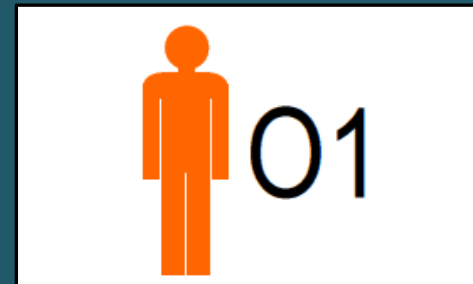
- 1 make-shift lab in each of 100 Ugandan primary schools
- 1 session in each involving
  - 5 teachers in the role of dictator
  - 5 parents of pupils in the role of recipient
  - 5 SMC members (present, paid, but passive in the DG)
- Teachers and parents randomly and anonymously paired
- 1 one-shot DG played
- Stake = 5,000 Ugandan Shillings (just under \$3.00)



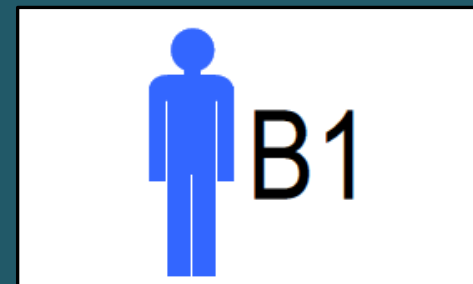
On arrival, teachers had to randomly pick one out of five badges with a green figure on it. They were told they would be referred to as *green players*.



On arrival, parents had to randomly pick one out of five badges with an orange figure on it. They were told they would be referred to as *orange players*.



On arrival, SMC members had to randomly pick one out of five badges with a blue figure on it. They were told they would be referred to as *blue players*.



Once subjects were seated in player-colour-specific zones, the session leader would do the introductions and then ask "Am I right in thinking that you are all teachers?" ...  
"During the workshop I will refer to you as green players."

# Theoretical framework

$$U_{it}^{\kappa} = x_{it}^{\kappa} - w^{\kappa} \alpha_t \sum_{j=i, -i} (x_{jt}^{\kappa} - \gamma_j^{\kappa})^2$$

where

$x_{jt}^{\kappa}$  = allocation by teacher  $t$  to  $j$  ( $=i$  for self,  $-i$  for other) in context  $\kappa$  ( $=S$  for contracted time,  $l$  for DG)

$\gamma_j^{\kappa}$  = reference point allocation to  $j$  in context  $\kappa$

$\alpha_t$  = preference to adhere to reference point

$w^{\kappa}$  = weight applied to reference point in context  $\kappa$

# Theoretical framework

$$x_{-it}^{s*} = \gamma_{-i}^s - \frac{1}{2w^s \alpha_t} \quad \text{and} \quad x_{-it}^{l*} = \gamma_{-i}^l - \frac{1}{2w^l \alpha_t}$$

Rearranging and combining on  $\alpha_t$  yields

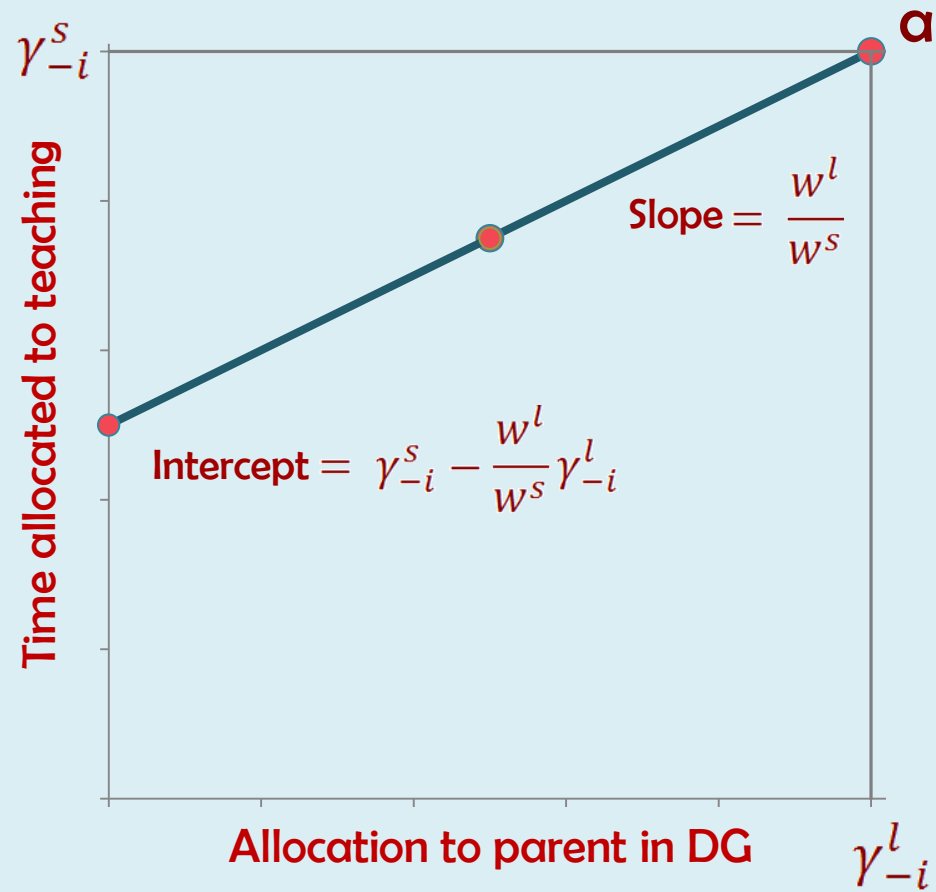
$$x_{-it}^{s*} = \beta_0 + \beta_1 x_{-it}^{l*}$$

where

$$\beta_0 = \gamma_{-i}^s - \frac{w^l}{w^s} \gamma_{-i}^l \quad \text{and} \quad \beta_1 = \frac{w^l}{w^s}$$

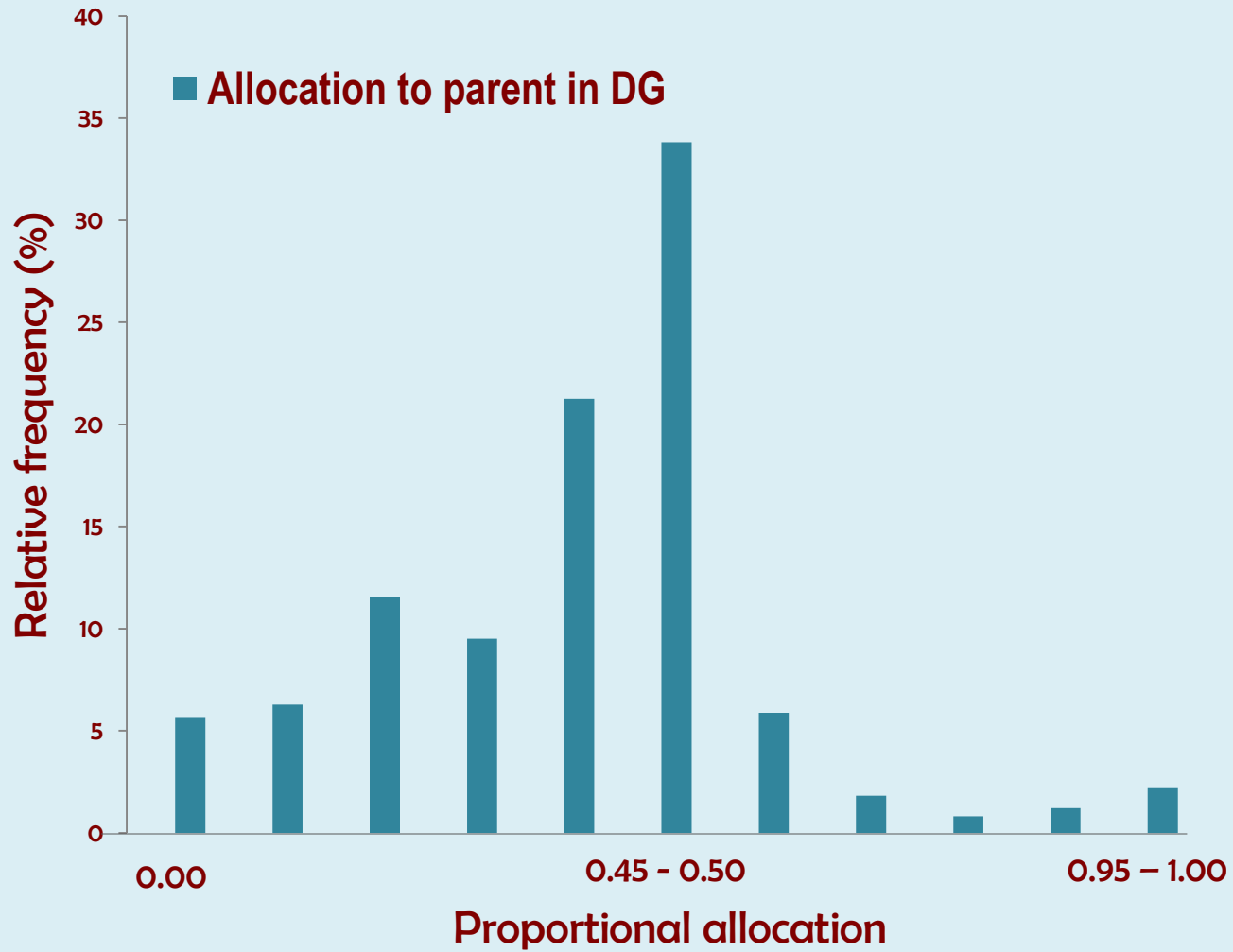


# Theoretical framework

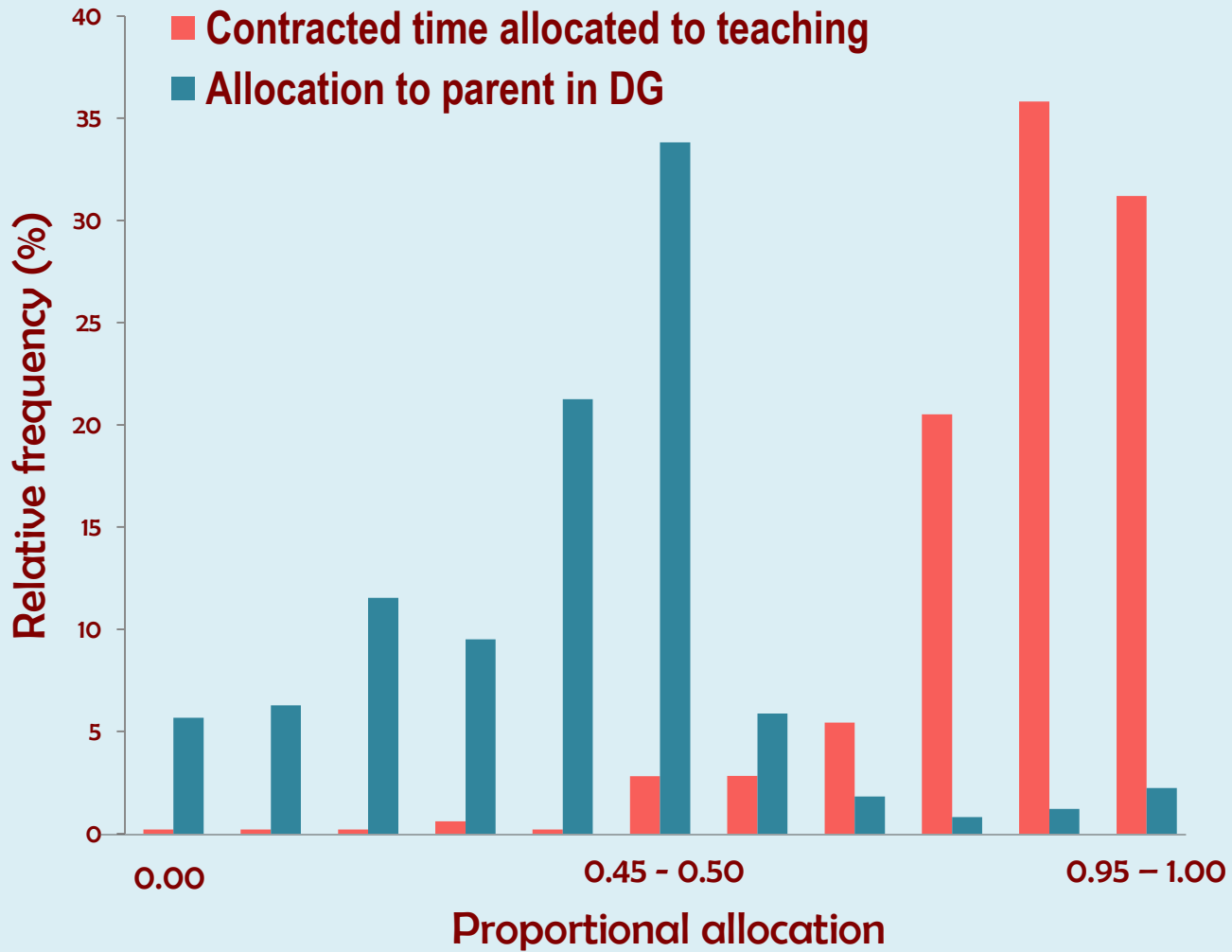


# Data

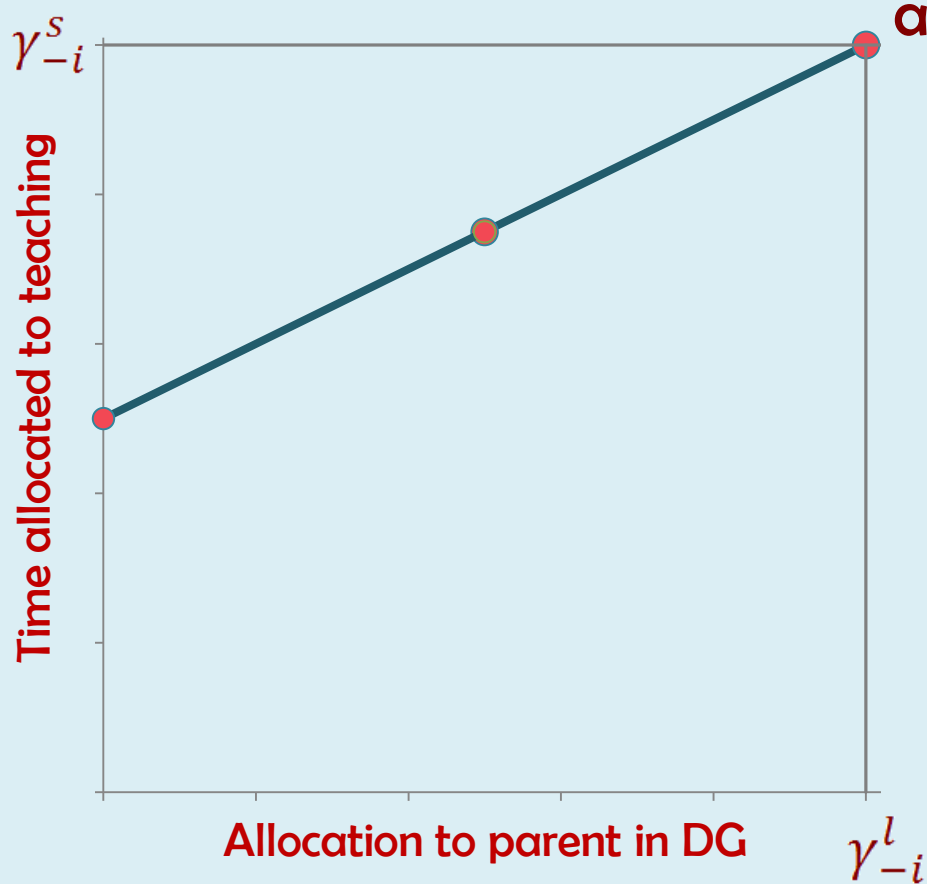
# Data



# Data



# Correlation test of external validity

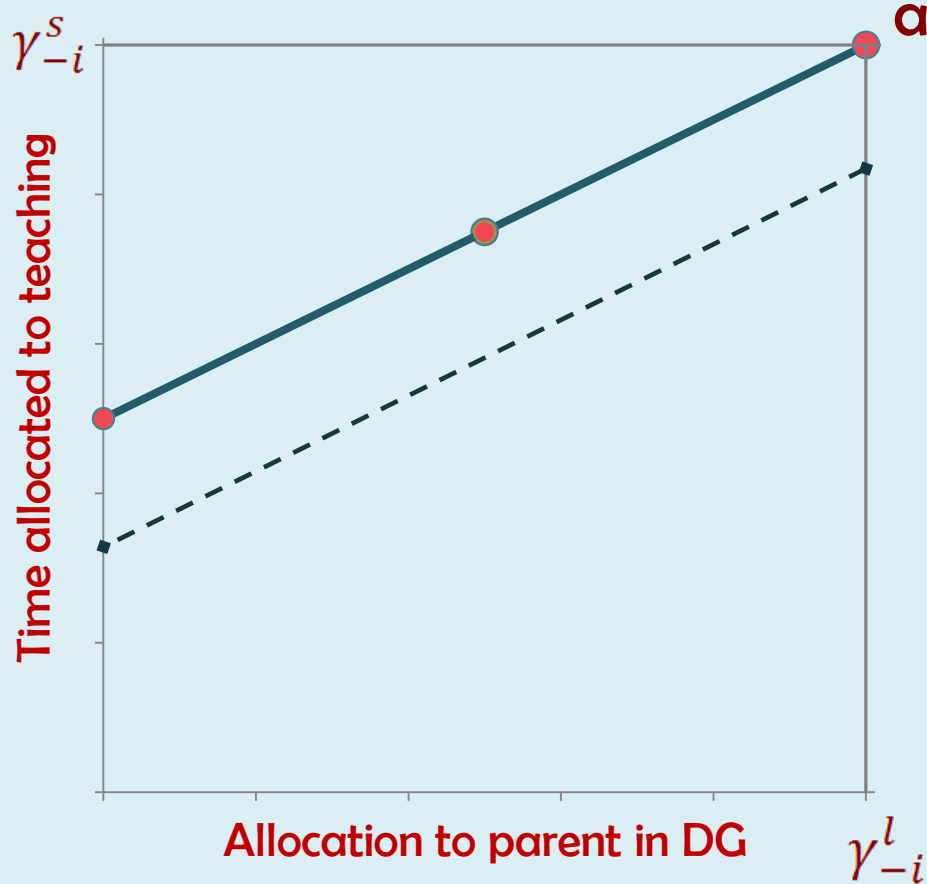


Dep. Var. = Time allocation

	1a
Constant	0.823 ***
DG allocation	0.066 *
R-squared	0.009
Obs	487

**Why is the correlation not stronger?**

# Variations in reference point across teachers owing genuine absence



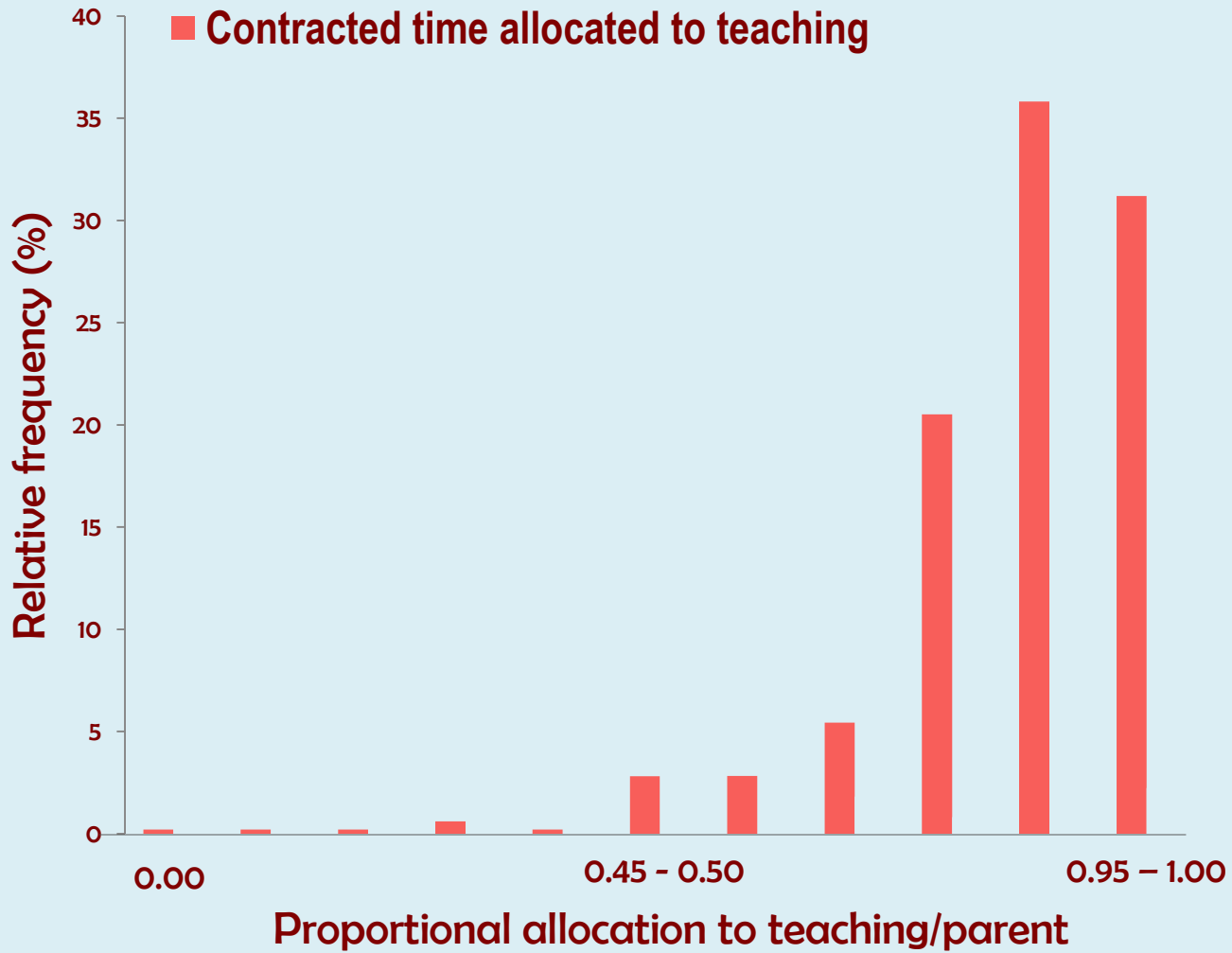
Dep. Var. = Time allocation

	1a
Constant	0.823 ***
DG allocation	0.066 *
R-squared	0.009
Obs	487

Dep. Var. = Time OR DG allocation

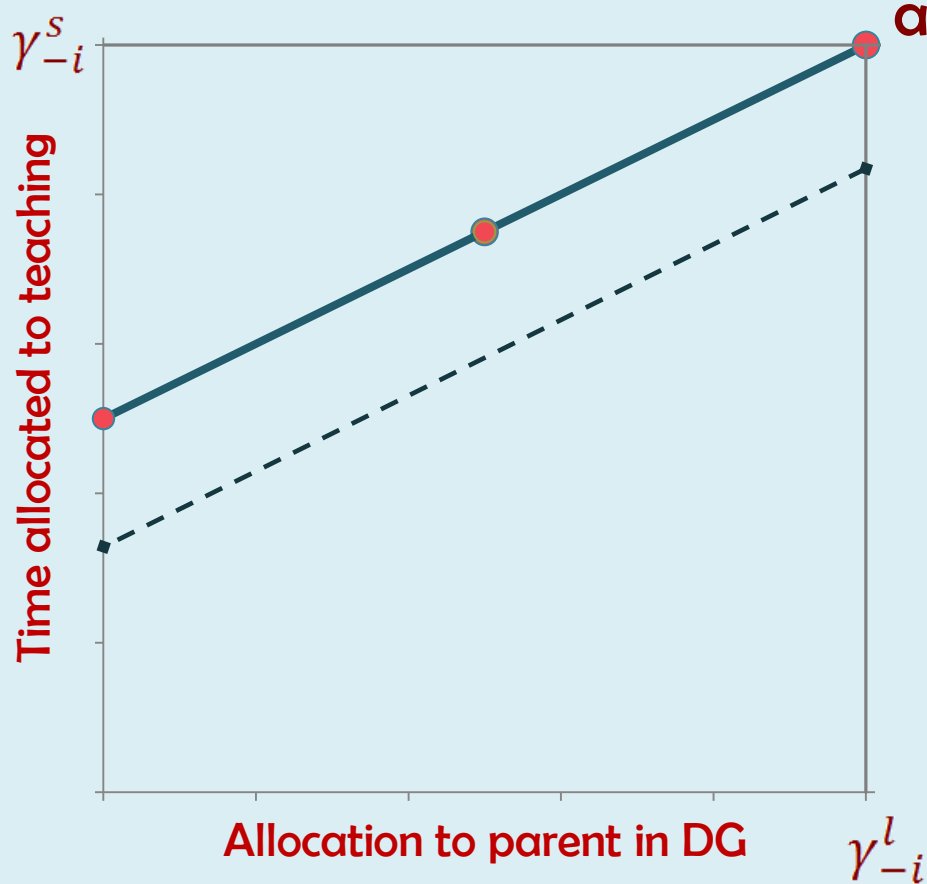
	1b
Constant	0.399 ***
Time context	0.450 ***
F-stat for teacher f.e.s	1.170 **
Within R-squared	0.785
Obs	974

# Data





# Variations in reference point across teachers owing genuine absence



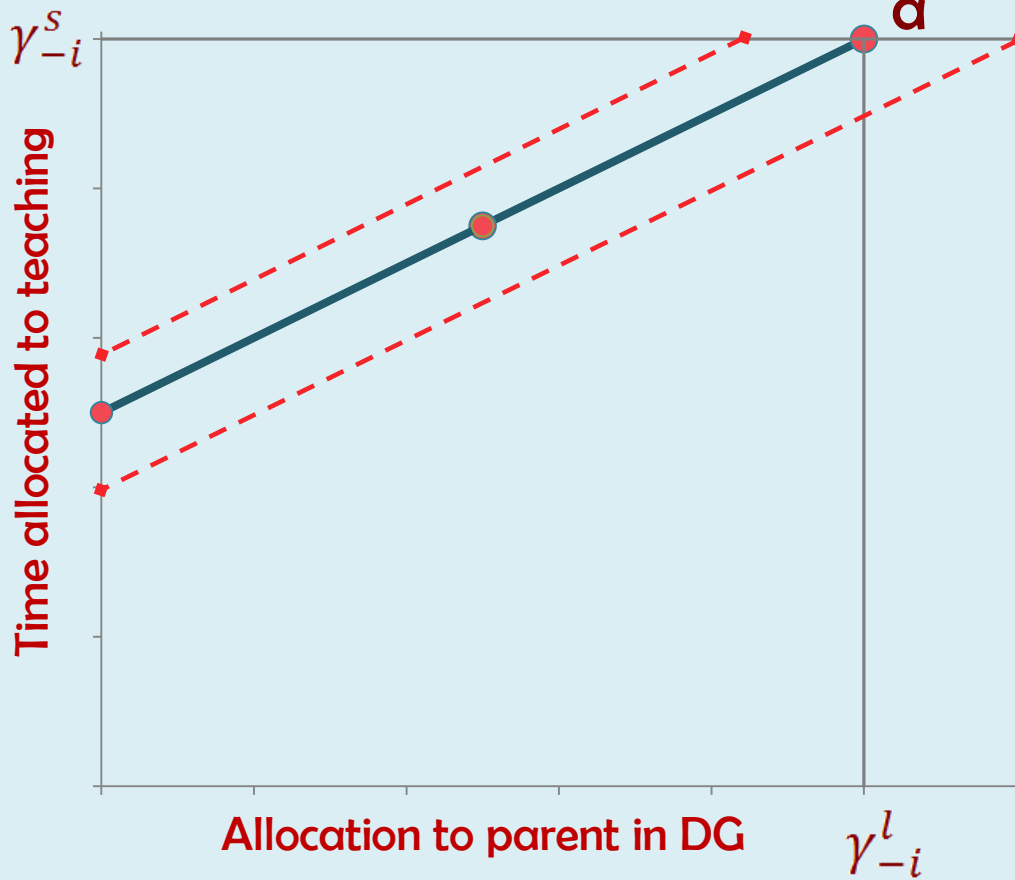
Dep. Var. = Time allocation

	1a
Constant	0.823 ***
DG allocation	0.066 *
R-squared	0.009
Obs	487

Dep. Var. = Time OR DG allocation

	1b
Constant	0.399 ***
Time context	0.450 ***
F-stat for teacher f.e.s	1.170 **
Within R-squared	0.785
Obs	974

# Variations in reference points across teachers owing to variations in relative wealth



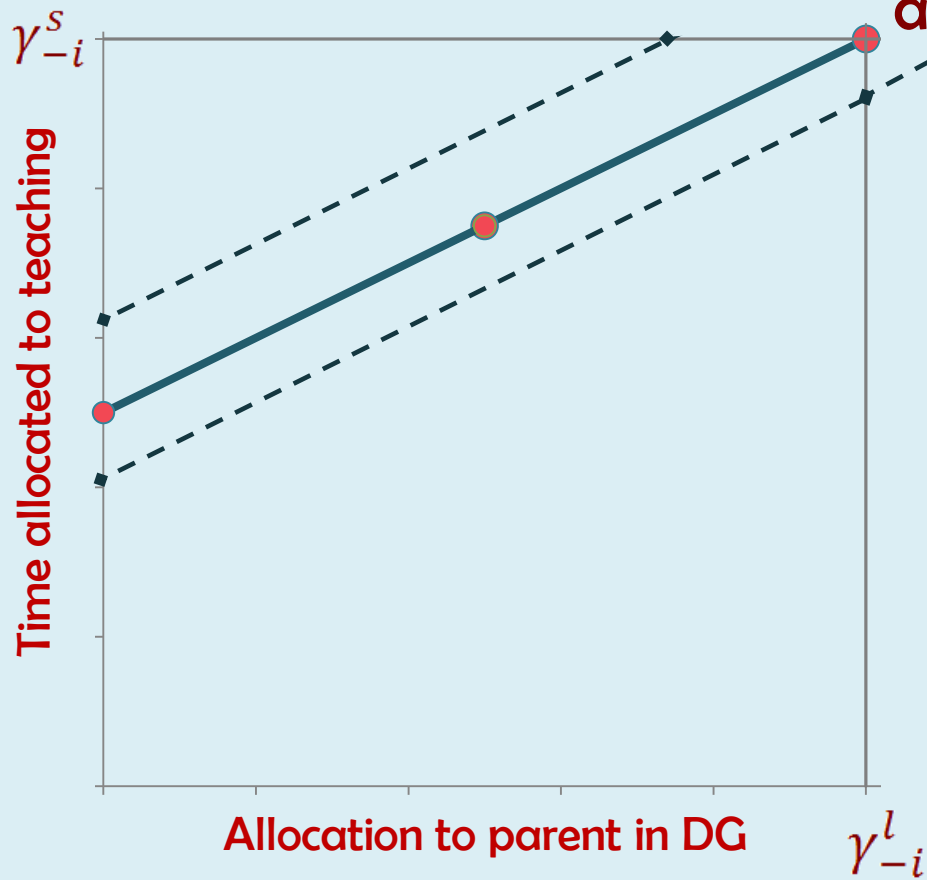
Dependent variable = Time allocation

	2a
Constant	0.836 ***
DG allocation	0.067 **
$\ln(\text{adj}(\text{wealth}_i - \overline{\text{wealth}_i}))$	
R-squared	0.014
Obs	476

Dependent variable = Time **OR** DG allocation

	2b
Constant	0.399 ***
Time context	0.464 ***
Time context * $\ln(\text{wealth}_i) - \ln(\overline{\text{wealth}_i})$	
F-stat for teacher fixed effects	1.220 **
Within R-squared	0.818
Obs	952

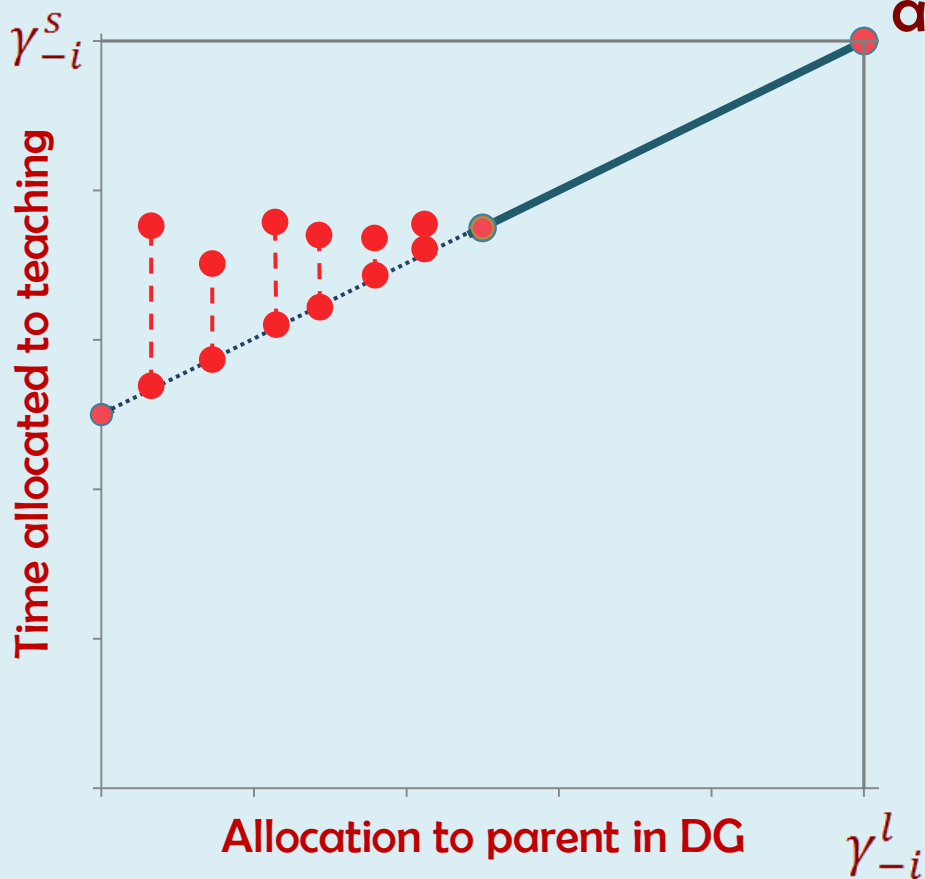
# Variations in reference points across schools



Dependent variable = Time allocation

	3a	4a
Constant	1.001 ***	
DG allocation	0.067 **	
$\ln(\text{adj}(\text{wealth}_i - \text{wealth}_{-i}))$	-0.008 ***	
F-stat for school f.e.s		
Obs	435	

# Variations in the extent to which teachers are informally held to account by SMCs



Dependent variable = Time allocation

	4a	5a
Constant	1.206 ***	
DG allocation	0.072 **	
$\ln(\text{adj}(\text{wealth}_i - \text{wealth}_{-i}))^\#$	-0.019 ***	
F-stat for school fixed effects	1.850 ***	
Obs	435	

Dependent variable = Time **OR** DG allocation

	3b	
Constant	0.404 ***	
Time context	0.451 ***	
Time context * $\ln(\text{wealth}_i) - \ln(\text{wealth}_{-i})$	-0.010 **	
F-stat for school fixed effects	1.919 ***	1.250 **
Obs	870	870

3+ SMC meetings in 6 months => correlation is broken  
 36 SMCs (out of 100) had 3+ meetings

# Summary

- DG between teachers and pupils' parents has some external validity as an experimental analogue to the status quo
- Some reasons for divergence are indicated by the data:
  - different reference points seem to apply to the DG and the teacher's time allocations
  - common (across contexts) preference to adhere to reference points may be variably salient across contexts (artificiality of alteration)
  - relative wealth of teachers (to parents) affects RPs differently in the DG and time allocation
  - RPs also vary across schools – local culture/social interact effects
  - In some schools teachers are held to account by SMCs – DG a poor analogue
- DG provides a useful measure of teacher motivations:
  - Facilitates the identification of an SMC effect that has never been identified before

To see the paper go to <http://www.csae.ox.ac.uk/workingpapers/pdfs/2010-11text.pdf>

# Empowering the SMC members

- After the DG we played two Third-party Punishment Games (TPGs) with SMC members in the third-party role:
  - **Teacher** still received 5,000 Shillings to divide between him or herself and the parent (new anonymous matchings)
  - **Parents** still passive recipients
  - **SMC member** received 2,500 Shillings and could pay back 500 to have the **teacher** fined 1,000
  - Strategy method applied to SMC members:
    - “What would you do (nothing or pay to fine) if the **green player** allocated 0 to the orange player?”
    - “What would you do (nothing or pay to fine) if the **green player** allocated 500 to the orange player?”
    - :
    - :
    - “What would you do (nothing or pay to fine) if the **green player** allocated 3,500 to the orange player?”
- In first TPG SMC members made their decision in private, in the second 80% had an audience (composition – teachers, parents, other SMC – varied)

# Empowering the SMC members

- Data a bit messy: around 30% of the strategies are inconsistent
- However, we got answers to two policy-relevant questions
- Headmasters sit on the SMCs: our data shows that they are conflicted, they fine less than other types of SMC member
- The SMCs are made up of local and non-local members: our data shows that local members fine neither more nor less when there is an audience, whereas non-local members fine more when teachers are watching
- We interpret the latter as evidence that, while both types may view the experiment as a rare opportunity to signal their intent to hold teachers to account, local members have to weigh this up against the disruption that would be caused to their on-going series of interactions with the teachers if they publicly fined a teacher => social embeddedness undermines local accountability mechanisms

paper forthcoming at <http://www.csae.ox.ac.uk/workingpapers/>