Determinants and malleability of truth-telling preferences

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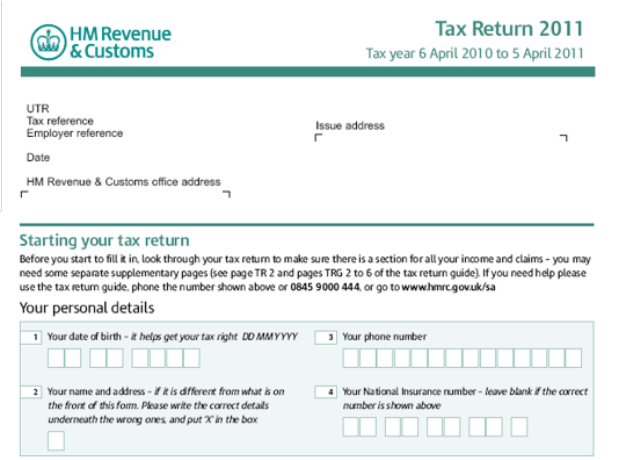
Private information plays a key role in many social interactions.



HM Revenue & Customs

Tax Return 2011

Tax year 6 April 2010 to 5 April 2011

UTR
Tax reference
Employer reference

Issue address

Date

HM Revenue & Customs office address

Starting your tax return

Before you start to fill it in, look through your tax return to make sure there is a section for all your income and claims – you may need some separate supplementary pages (see page TR 2 and pages TRG 2 to 6 of the tax return guide). If you need help please use the tax return guide, phone the number shown above or **0845 9000 444**, or go to **www.hmrc.gov.uk/sa**

Your personal details

1 Your date of birth – *it helps get your tax right DD MM YYYY*

2 Your name and address – *if it is different from what is on the front of this form. Please write the correct details underneath the wrong ones, and put 'X' in the box*

3 Your phone number

4 Your National Insurance number – *leave blank if the correct number is shown above*

Contrary to traditional economic assumptions, many people have some preference for truth-telling.

- Usual economic assumption: report whatever maximizes material payoff
- But parents, teachers, priests tell you: don't lie
- Dilemma between money and adhering to norm (or at least appearing to do so)

Contrary to traditional economic assumptions, many people have some preference for truth-telling.

- Explosive growth of experimental literature across economics, psychology and sociology (e.g., Gneezy 2005, Charness/Dufwenberg 2006, Mazar et al. 2008, Fischbacher/Föllmi-Heusi 2013)
- Many people seem to have preferences for truth-telling: lie little or not at all

Research question: This paper studies the determinants of the preferences for truth-telling.

- What shapes preferences for truth-telling?
- Focus on the effect of parents and the social environment

Establishing the determinants of preferences is difficult.

- We think of preferences as stable determinants of behaviour
- Need deep intervention
- Need long-term and/or persistent change in behaviour to be able to claim that preferences have changed

We measure how a sample of children reports private information.

- Correlate parental characteristics with child's reporting behaviour
- Main part: Establish causal effect of social environment on preferences for truth-telling
- Intervention provides children with a mentor for a year (Balu & Du)
- Reporting behaviour measured almost four years after end of intervention

Learning about determinants and malleability of reporting is important for several reasons.

- Optimal design of institutions depends on distribution of truth-telling in the population
- Knowing determinants allows us to understand how preferences for truth-telling are formed
- So far, only few contemporaneous correlates known (gender, age, educational status)

Learning about determinants and malleability of reporting is important for several reasons.

- Parental effect on preferences potential channel for inter-generational transmission of SES
- Knowing effect of social environment opens possibility of policy intervention, e.g., to reduce pre-existing differences between groups

We also add to the literature on child development.

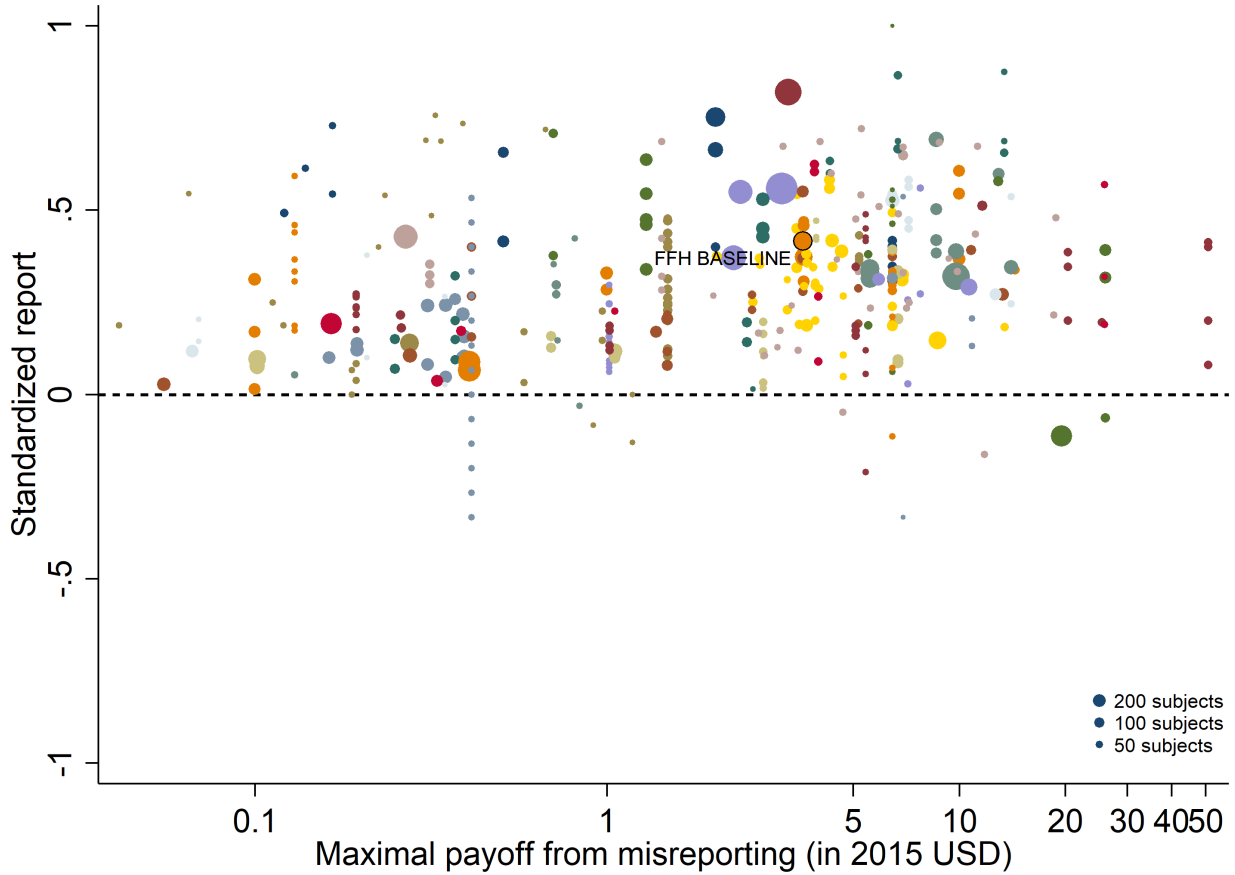
- Many studies on development of skills, preferences and norms among children
- Truth-telling among children (e.g., Bucciol/Piovesan 2011, Glätzle-Rützler/Lergetporer 2015, Houser et al. 2016, Alan et al. 2018, Maggian/Villeval 2016)
- Many other aspects important besides truth-telling: cognitive skills, non-cognitive skills, grit, pro-sociality, etc. (e.g., Sutter et al. 2018; Harbaugh/Krause 2000; Kosse et al. forthcoming; Alan/Ertac forthcoming)

Study Design

We use the die-rolling paradigm to measure preferences for truth-telling.

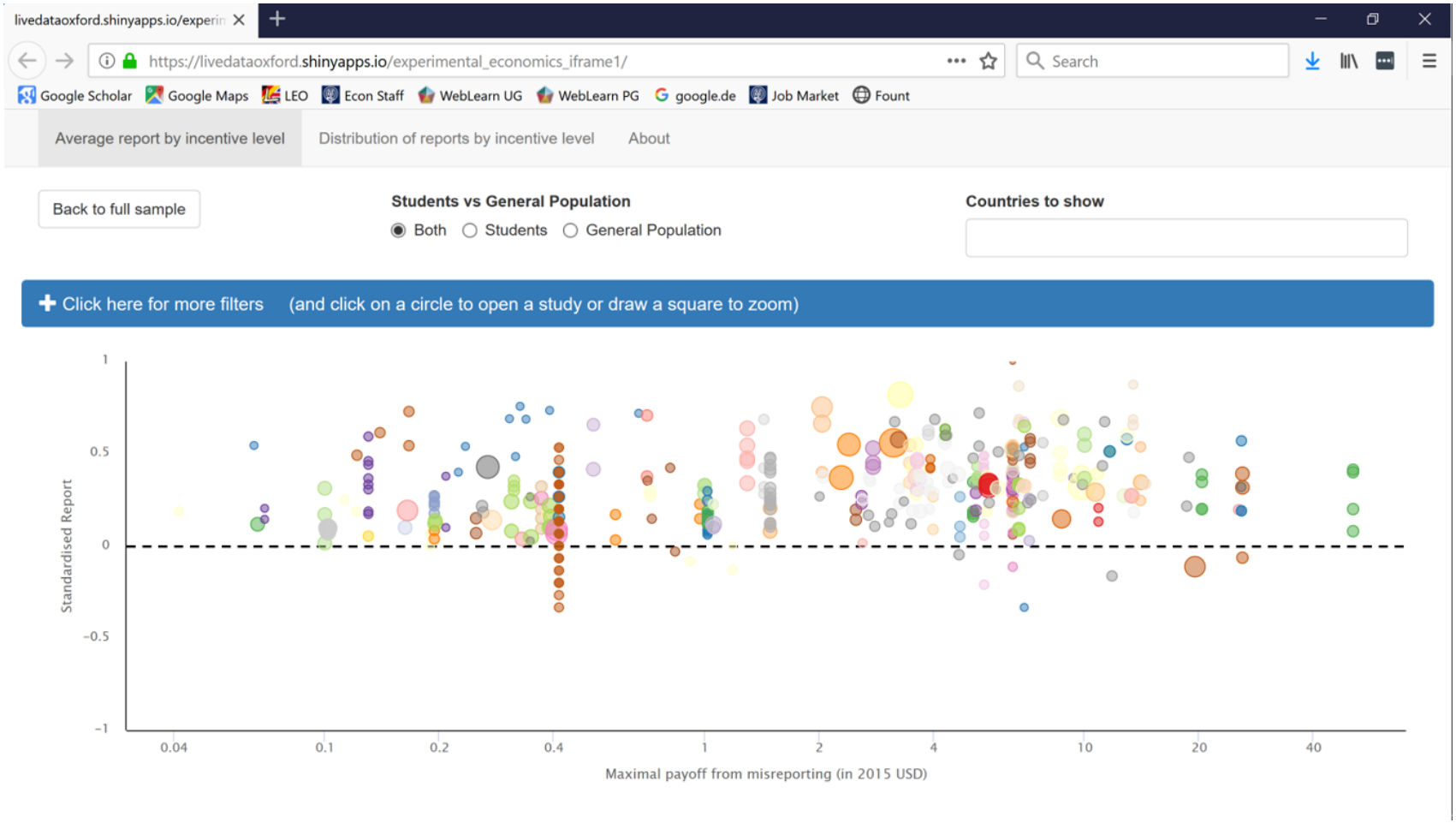
- Die rolling task suggested by Fischbacher/Föllmi-Heusi (2013) ("FFH")
  - Subjects privately roll a die (or use some other randomization device)
  - Report outcome
  - Material payoff is equal to the report
- Abstracts from strategic interaction
- Reports correlate strongly with non-lab cheating behaviour
  - Dai et al. 2016, Cohn et al. 2015, Cohn/Maréchal forthcoming, Hanna/Wang 2017, Potters/Stoop 2016, Gächter/Schulz 2016, Kröll/Rustagi 2017

A recent FFH meta study shows subjects realize only about 25% of possible gains from lying.



Abeler/Nosenzo/Raymond forthcoming

The meta study is an easy entry point into the literature via www.preferencesfortruthtelling.com



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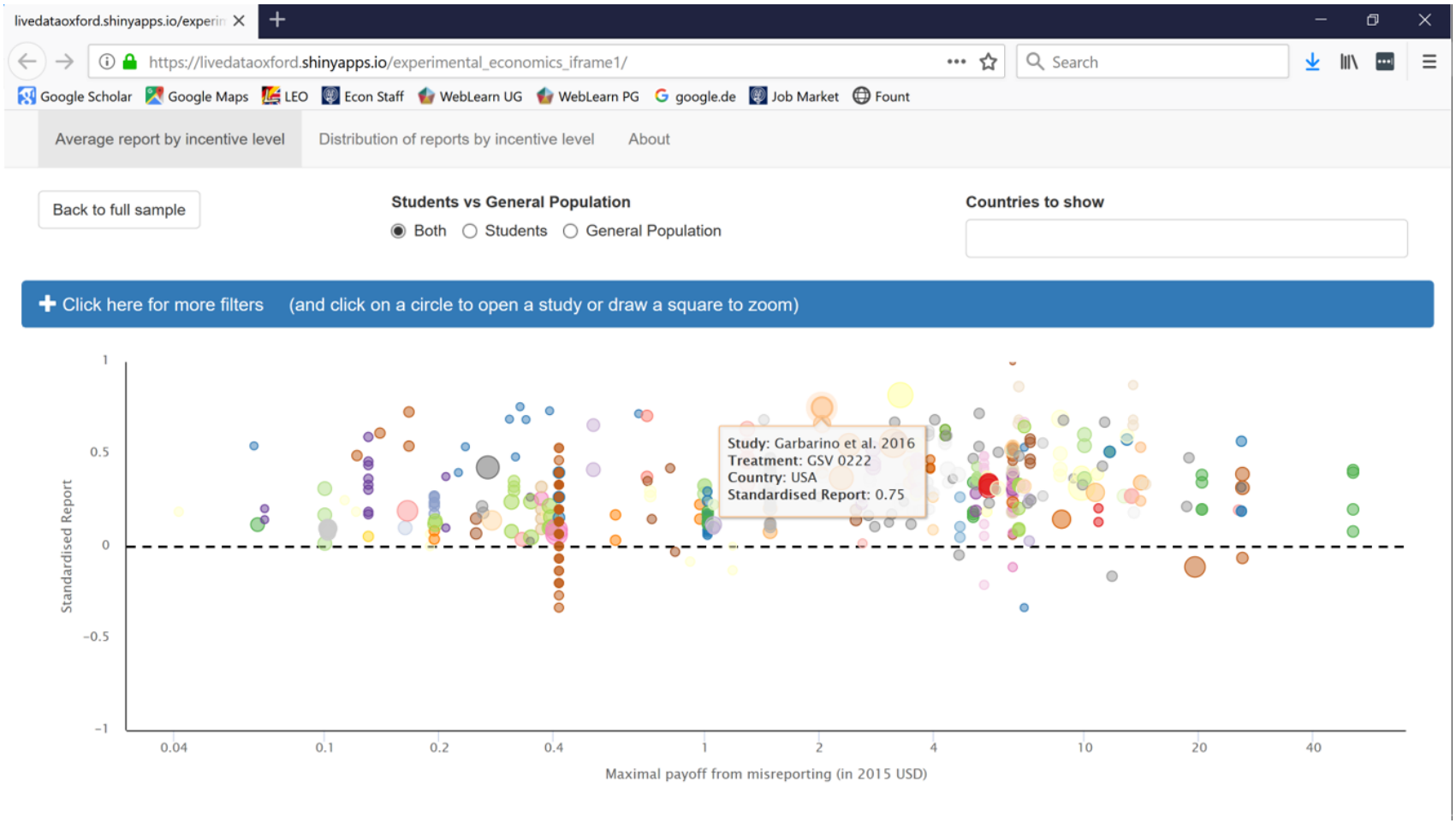

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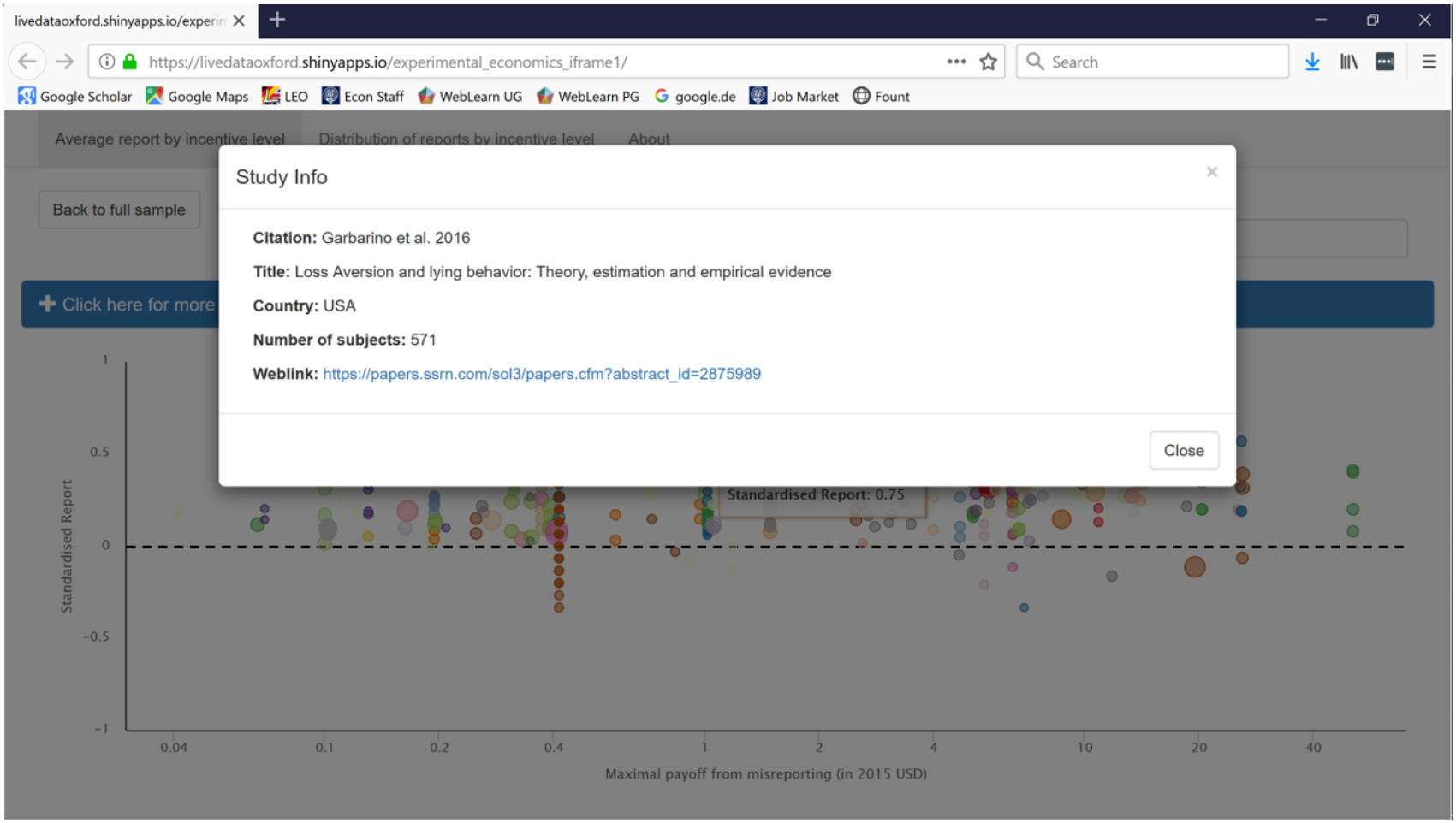

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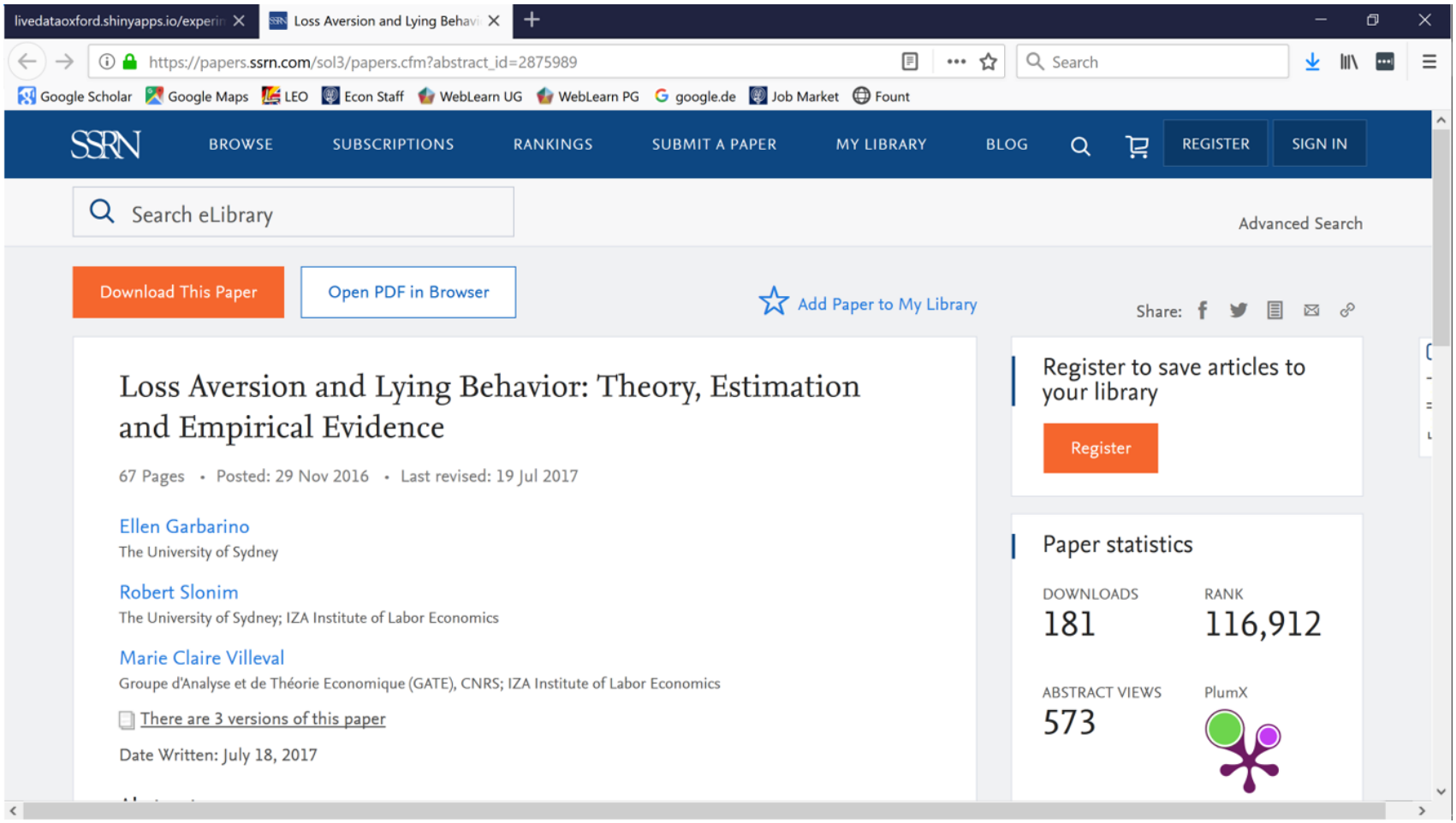

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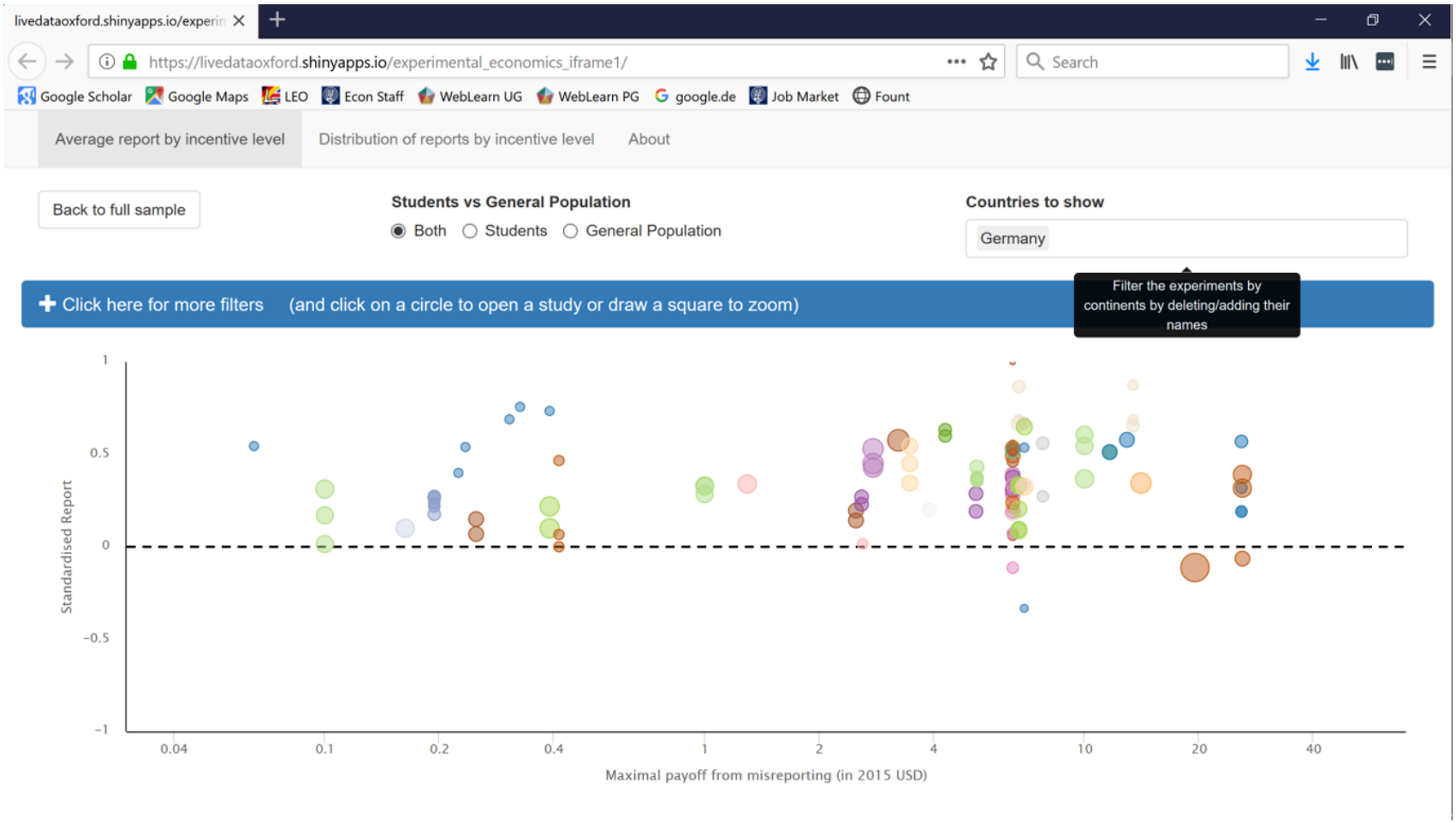


Designing FFH experiments faces several challenges.

- Participants often lie very little, reducing power ("game", report guess)
- Participants might not believe that the random draw is truly private (computer guided, report guess)
- Disentangling lies from "true high reports" is difficult (small winning probability)

We conduct the FFH experiments at participants' homes.

- Experiments conducted trained GSOEP interviewers
- "You can now play a small game alone on the computer. The game is called 'Guess a number' "
- Interviewer hands over die and dice cup and withdraws to distant corner of room
- Child guided through experiment step by step by tablet computer
- "Try out die rolling a couple of times."

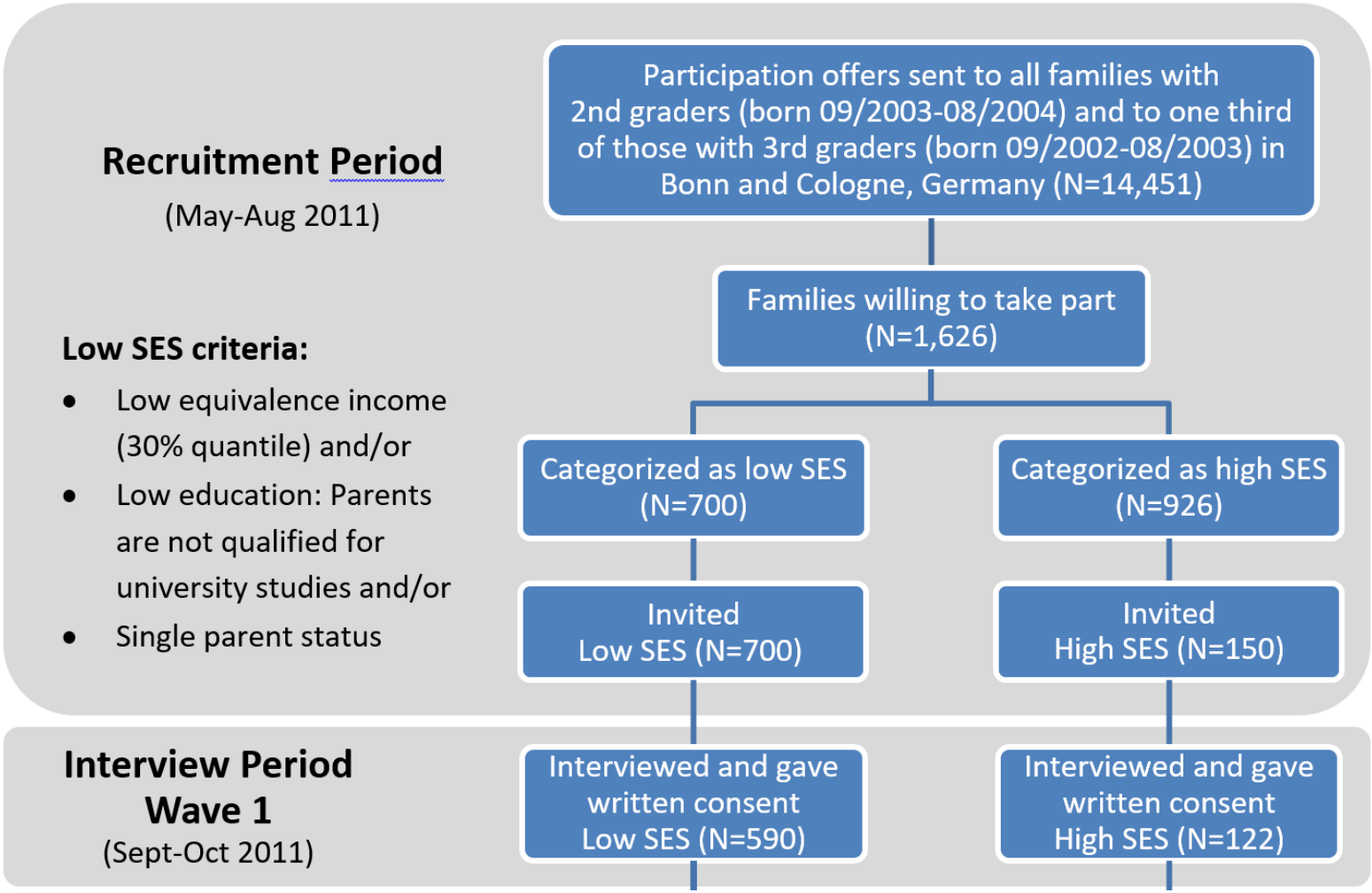
Participants had to report whether they correctly guessed a hidden die roll.

- Overview of experiment
  - "Roll the die but don't look at the number."
  - "Guess the number you rolled. Remember your guess."
  - "Then check whether you guessed correctly."
  - "Enter on the computer whether you have guessed correctly or not. If you guessed correctly, you receive 5 stars [=2.50 euros]"
- Each step again explained on tablet as child does individual steps
- Incentives in line with many FFH experiments, probably high compared to participants daily "income"

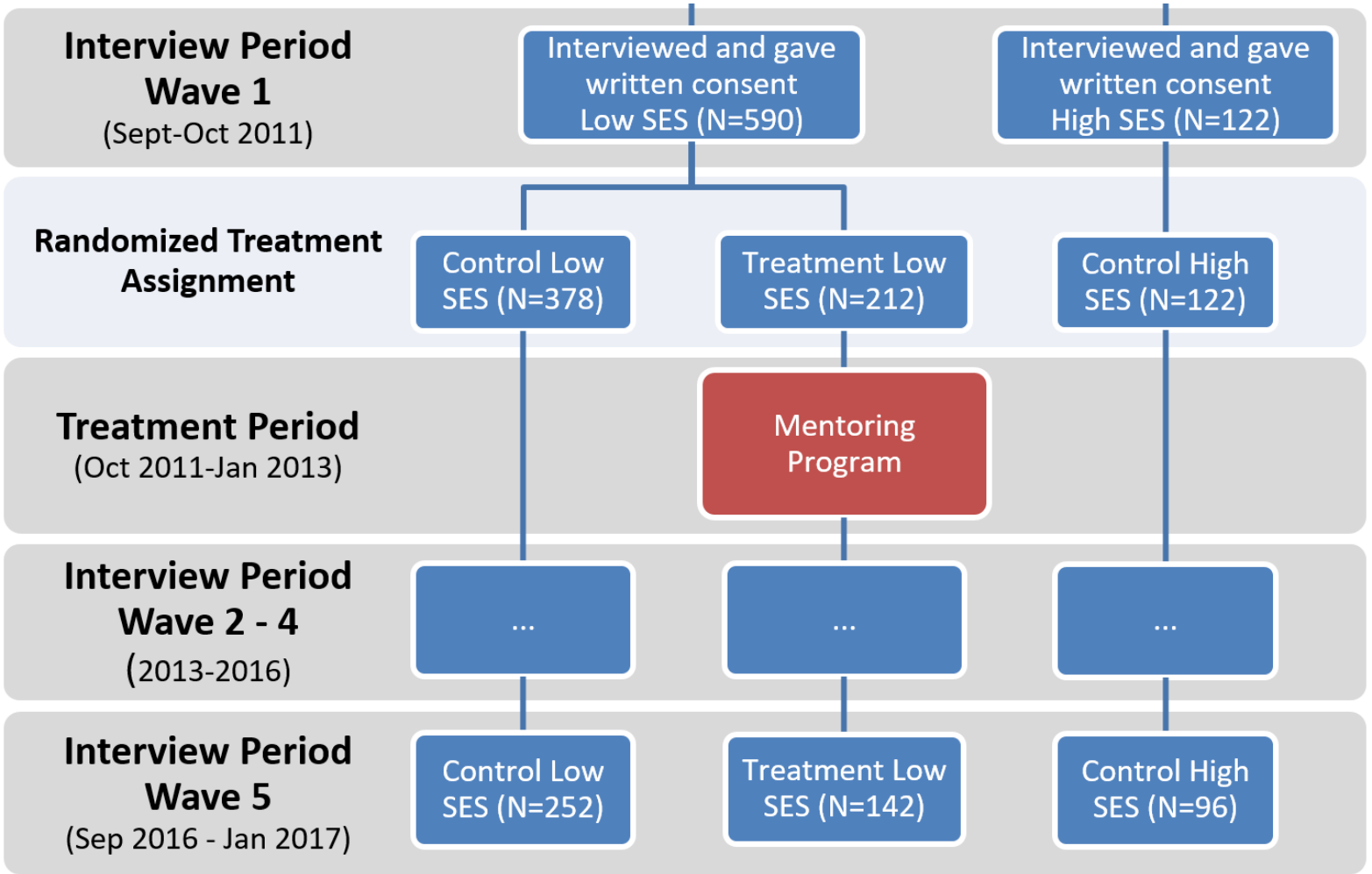
Overall, about half of participants falsely report to have guessed correctly.

- Design based on "mind games" by Jiang 2013 and Greene/Paxton 2009
- 1/6 chance of guessing correctly
- Same incentives and probabilities as normal "win if reported 6" experiment but with second layer of un-observability
- Overall, 61% of participants report to have guessed correctly, i.e., if no one lied downwards, 53% of wrong guesses are falsely reported as correct

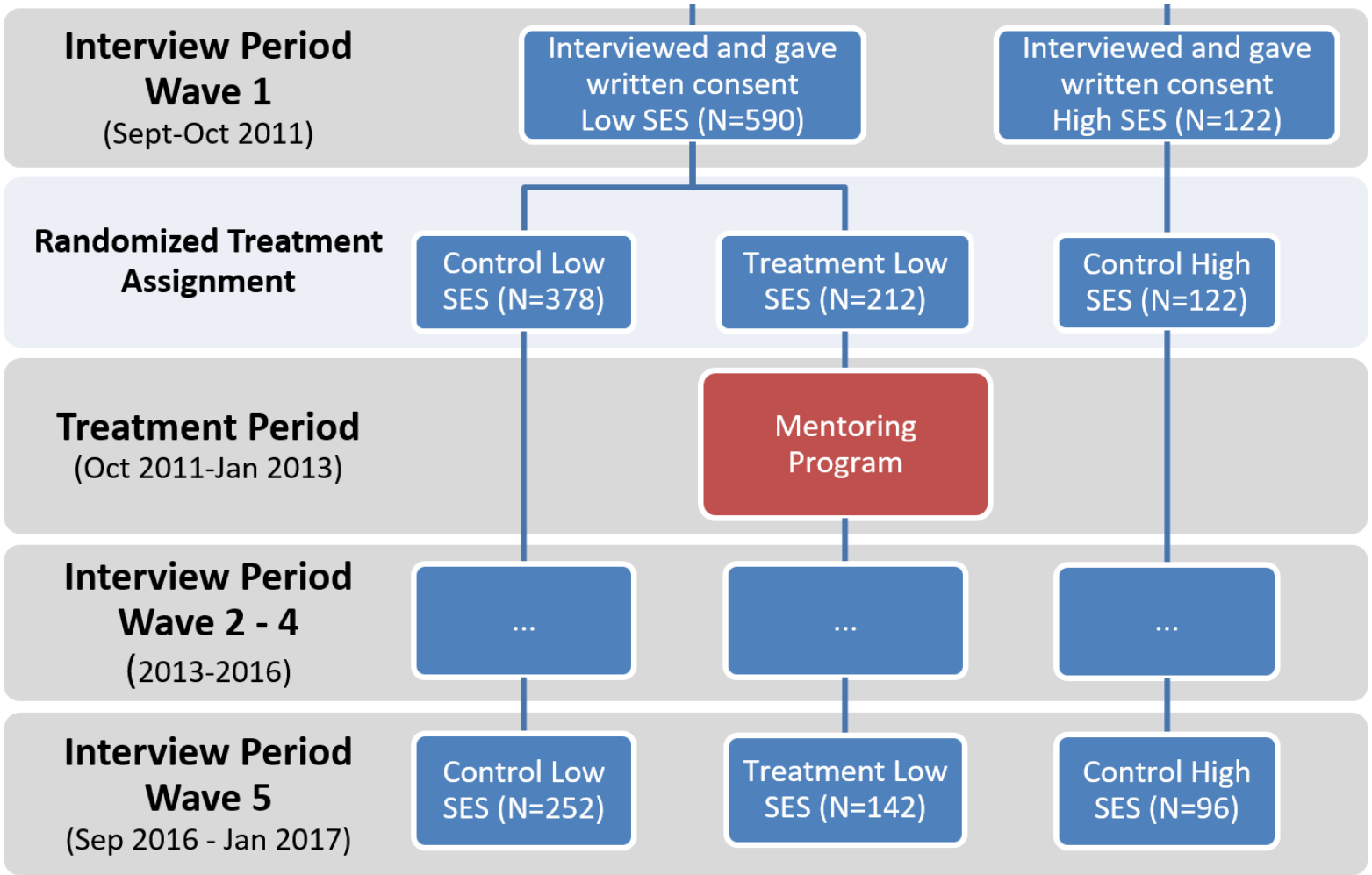
Low and high SES children from Cologne/Bonn area were invited to participate in the study.



Low SES children were randomly allocated to treatment and control group.



FFH experiments were conducted 3.5 to 4 years after the end of the intervention.



FFH experiments were conducted 3.5 to 4 years after the end of the intervention.

- During intervention, participants about 8–9 years old
- During FFH experiment, participants on average 12.5 years old
- Share female: 0.480

Mentoring program focuses on enriching the social environment.

- Well-established mentoring program (Balu und Du)
- Mentors:
  - Volunteers, mainly university students
  - Meet children once per week
  - Overall duration up to one year (average: 9 months, 23 meetings)
- Concept of the mentoring program:
  - One-to-one mentoring, "informal learning", no focus on achievement
  - Widening a child's horizon through social interactions with a new attachment person
  - Interactive social activities such as cooking, visiting the zoo or park, or just having a conversation
- Professional structure: online diaries, paid coordinators, bi-weekly monitoring meetings

Hypotheses

Parents and the social environment could affect truth-telling through several channels.

- Role model: child imitates behaviour of parents and mentors
- Time investment/teaching: parents/mentor teach norm to child
- Care about audience: truth-telling partly driven by desire to appear honest (Abeler et al. forthcoming, Gneezy et al. 2018)
- Mentors as substitutes

Results

We correlate the child's reporting behaviour with parental and family characteristics.

- Dependent variable: reported to have guessed number correctly
- Pre-determined parental characteristics reduce reverse causality
- Leaves omitted variables – only weak claim for causality (but see below)
- Restrict sample to two control treatments for correlational analysis

We correlate the child's reporting behaviour with parental and family characteristics.

- Household socio-economic status (used for treatment assignment: Low vs. High SES)
  - Household income: below 30th percentile
  - Education: neither parent has school-leaving degree qualifying for university studies
  - Single parent
- Family size
- Mother's age, mother's IQ
- Warm parenting style: PCA of warmth (+), punishment (–), monitoring (+) (questionnaire at baseline)
- Mother's trust (questionnaire at baseline)
- Mother's preferences: patience, risk, altruism (questionnaires at baseline)

Lower parental income is associated with higher reports.

	Reported correct guess		
	(1)	(2)	(3)
Female	-0.163***	-0.162***	-0.168***
	(0.048)	(0.048)	(0.048)
Age (in years)	-0.122***	-0.121***	-0.111**
	(0.043)	(0.043)	(0.043)
Low SES household		0.034	
		(0.056)	
Low income household			0.155***
			(0.052)
Low education household			-0.050
			(0.054)
Single parent household			-0.025
			(0.053)
Sample restriction		High & Low SES Control	
Observations	348	348	348

Average marginal effects after Probit, robust standard errors.

Lower parental income is associated with higher reports.

- Effect of income also holds after controlling for (pre-treatment) pocket money
- Parental income probably better proxy for consumption of children than pocket money

Parenting style, mother's IQ and trust predict reporting.

	Reported correct guess					
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.164***	-0.167***	-0.159***	-0.164***	-0.167***	-0.162***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
Age (in years)	-0.121***	-0.117***	-0.117***	-0.116***	-0.118***	-0.122***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
Number of siblings	0.012					
	(0.026)					
Mother's age at baseline		-0.006				
		(0.004)				
Warm parenting style			-0.049**			
			(0.024)			
Mother's IQ				-0.051**		
				(0.022)		
Mother's trust					-0.047*	
					(0.027)	
Mother's patience						-0.015
						(0.025)
Mother's WTT risk						0.017
						(0.026)
Mother's altruism						0.017
						(0.025)
Sample restriction	High & Low SES Control					
Observations	348	348	348	348	348	348

Average marginal effects after Probit, robust standard errors

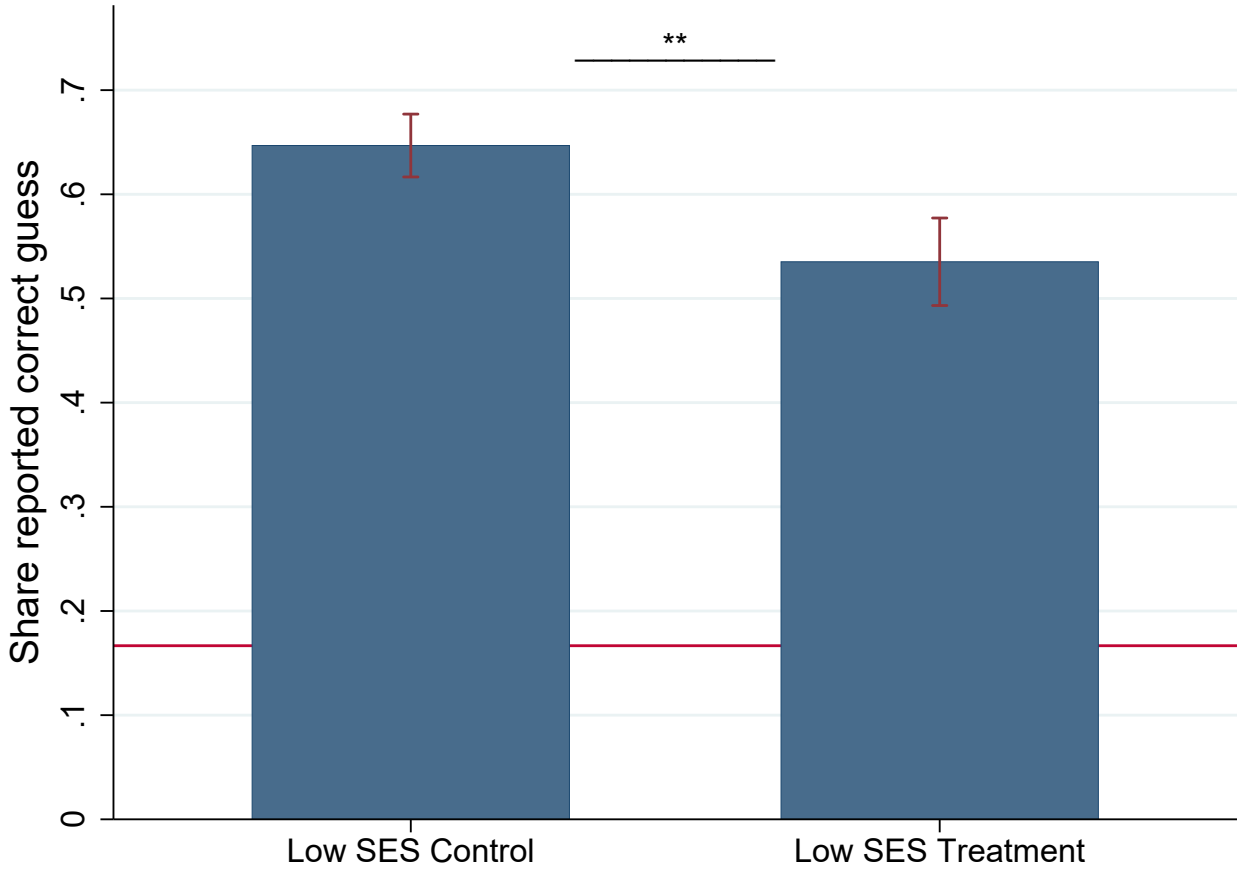
Parenting style, mother's IQ and trust predict reporting.

- Mother's years of education has same effect as mother's IQ (correlation mother's years of education and low-education-household dummy: -0.636)
- Preferences also individually not significant; we didn't elicit truth-telling preferences of parents

We extend the correlational evidence by studying a mentoring RCT.

- Correlational evidence shows high reports are associated with
  - Poorer households
  - Mother's with lower IQ and less trust
  - Mother's with less warm parenting style
- The mentoring program is randomly allocated and allows for a causal interpretation
- Intention-to-treat effect (74% take up)
- Any effect we find would be long-term: reporting experiments conducted almost four years after intervention

The treatment significantly reduces reporting.



Assuming no downward lying: 58% of control participants lie, 44% of treated participants lie

The treatment significantly reduces reporting.

	Reported correct guess			
	(1)	(2)	(3)	(4)
Treatment dummy	-0.111**	-0.121**	-0.119**	-0.095**
	(0.052)	(0.051)	(0.049)	(0.048)
Female		-0.115**	-0.102**	-0.126***
		(0.047)	(0.048)	(0.046)
Age (in years)		-0.140***	-0.139***	-0.148***
		(0.040)	(0.043)	(0.039)
Pocket money			0.012	0.012
			(0.018)	(0.019)
IQ			-0.014	-0.009
			(0.025)	(0.026)
Patience (baseline)			0.025	0.028
			(0.024)	(0.023)
Willing. to take risk (baseline)			0.015	0.029
			(0.024)	(0.023)
Altruism (baseline)			-0.003	-0.008
			(0.024)	(0.023)
Additional controls	No	No	No	Strata & Int. FE
Sample restriction	Low SES Control & Treatment			
Observations	394	394	394	394

Average marginal effects after Probit, robust standard errors

The treatment significantly reduces reporting.

- Treatment effect similar size as gender difference, one year of age,
- Control variables
  - IQ: Fluid IQ (HAWIK IV) and crystallized IQ (PPVT-R)
  - Patience: Incentivized choice between smaller amount now or larger amount in a week
  - Willingness to take risk: Incentivized choices between safe option and risky option
  - Altruism: PCA of three incentivized dictator game experiments
- No interaction effect significant
- Treatment more pronounced for boys ($p = 0.169$)

Treatment effect is weaker for those who get stimuli at home.

	Reported correct guess		
	(1)	(2)	(3)
Treatment dummy	-0.114**	-0.115**	-0.123**
	(0.051)	(0.051)	(0.051)
Female	-0.122**	-0.119**	-0.119**
	(0.048)	(0.048)	(0.049)
Age (in years)	-0.138***	-0.136***	-0.139***
	(0.043)	(0.043)	(0.043)
Warm parenting style	-0.065**		
	(0.026)		
Treat × warm PS	0.089**		
	(0.043)		
Mother's IQ		-0.048**	
		(0.022)	
Treat × mother's IQ		0.058	
		(0.045)	
Mother's trust			-0.067**
			(0.030)
Treat × mother's trust			0.040
			(0.052)
Sample restriction	Low SES Control & Treatment		
Observations	394	394	394

OLS estimates, robust standard errors

Treatment effect is weaker for those who get stimuli at home.

- Mentors have generally warmer style, higher IQ and trust more
- Strengthens the case that mother's parenting style, IQ and trust affect child's reporting behaviour

Is our treatment effect distinct from treatment effect on prosociality?

- Kosse et al. (forthcoming) analyze the same RCT and find a causal effect on prosociality
- Prosociality is equally-weighted score of the standardized measures of
  - Three incentivized dictator game experiments with child of same age
  - Three questions on trust (SOEP questions)
  - Mother's answers to "Prosocial Scale" questions of "Strength and Difficulties Questionnaire" (SDQ)
- Prosociality and truth-telling arguably related
- We control for treatment effect on prosociality to check whether there is a distinct treatment effect on reporting behaviour

Treatment effect on reporting behaviour is distinct from treatment effect on prosociality.

	Reported correct guess		
	(1)	(2)	(3)
Treatment dummy	-0.119**	-0.103**	-0.101**
	(0.049)	(0.049)	(0.049)
Female	-0.114**	-0.101**	-0.103**
	(0.048)	(0.048)	(0.048)
Age	-0.139***	-0.132***	-0.134***
	(0.041)	(0.041)	(0.041)
Prosociality (baseline)	-0.002		0.028
	(0.024)		(0.027)
Prosociality (post-treatment)		-0.047**	-0.061**
		(0.024)	(0.027)
Sample restriction	Low SES Control & Treatment		
Observations	394	394	394

OLS estimates, robust standard errors

Backup: There is no selection on observables into treatment or attrition.

	Assigned to treatment		Lost to follow-up	
	(1)	(2)	(3)	(4)
Conduct problems (SDQ, baseline)	-0.009	-0.015		0.015
	(0.020)	(0.025)		(0.025)
Treatment dummy			-0.003	-0.002
			(0.040)	(0.041)
Conduct problems × treatment				0.012
				(0.039)
Sample restriction	Low SES Treatment & Control			
Add sample restriction	No	Exp. data	No	No
Observations	590	394	590	590
R2	0.000	0.001	0.000	0.002
p-value F-test	0.648	0.544	0.939	0.758

OLS estimates, robust standard errors

- Best proxy at baseline we have is "conduct problems" score of SDQ
- Asks, amongst others, for mothers' perception of child's lying and stealing
- Spearman correlation with "reported correct guess": 0.110 ($p = 0.015$, $N = 490$)

Conclusion

- We find a long-term effect of mentoring intervention on reporting behaviour of children
- Preferences for truth-telling are malleable and can be changed by intervention
- Parental characteristics also important, our results suggest that income, IQ, parenting style and trust are important
- More research needed on effects of preferences for truth-telling on outcomes

It would be very useful to know the consequences of truth-telling for individuals.

- Very little known about consequences of truth-telling, not even correlations
- For causal interpretation, we would first need to find a way to exogenously change preferences for truth-telling
- We will be able to say a little in a few years