The Future in Mind: Aspirations and Future-Oriented Behaviour in Rural Ethiopia

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Do role models have persistent effects on economic behaviour?

When a young person, even a gifted one, grows up without proximate living examples of what she may aspire to become [...] her goal remains abstract. [...] ***A role model*** *[...] provides more than inspiration; his or her very existence* ***is confirmation of possibilities one may have every reason to doubt****, saying, "Yes, someone like me can do this."*

Sonia Sotomayor

Do role models have persistent effects on economic behaviour?

Role models are often cited as an inspiration by successful individuals

Often disadvantaged groups may lack exposure to role models they can relate with, potentially because successful individuals have left their community

However, we know that exposure to role models can improve investments and change the occupational and subject choices of different groups

But we still lack evidence on whether exposure to role models in adulthood can have lasting effects on economic decision-making

This paper

Experimentally vary **exposure to role models**: individuals are invited to watch documentaries about four role models (e.g. Riley, 2020; Porter and Serra, 2020; Bhan, 2020; Beaman et al., 2012; Chong et al. 2012; Jensen and Oster, 2009)

Find persistent increases in effort, agricultural and educational investment, and assets five years after exposure

Measure a range of **potential psychological mechanisms** and find evidence that results are consistent with a *persistent shift in aspirations*

Identify whether effects arise from exposure to media (placebo) or from spillovers (within village controls and pure controls)

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Conceptual framework

Model goals/aspirations using reference-dependent utility (Koszegi and Rabin, 2006; Dalton, Ghosal, and Mani, 2015; Genicot and Ray, 2017)

Add a concave gains-loss function increasing in the reference-point gap

- utility increases as people over-achieve relative to their reference point
- utility decreases if people under-achieve

Solving an intertemporal labour and consumption decision with this utility function we see that:

- Increase in current aspirations
- $\rightarrow$ shift from current consumption & leisure toward investment & labour supply
- $\rightarrow$ higher future assets

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Doba district: Sample characteristics at baseline (2010)

Rural, isolated, poor district, subsistence farmers

60% of sample had only seen TV once in the last year, 12% ever travelled outside district

98.5% are subsistence farmers growing sorghum and maize (CSA, 2007)

Future-oriented behaviour is not universal:

- Only 58% use any modern agricultural technology (45% use any livestock input)
- Only 58% of 7-15 year olds are enrolled in school
- 37% have any savings

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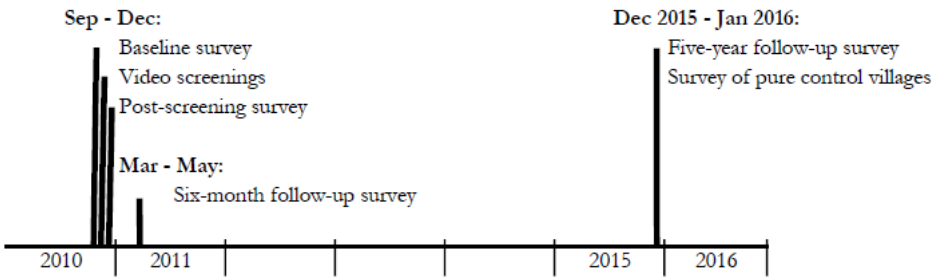
Role models videos of individuals from a similar background


With that seed money Teyiba begins a small-scale flour trading.


She bought a donkey for 300 Birr
that relieves her of carrying heavy loads.

Timeline

Surveys at baseline, after six months and after 5 years

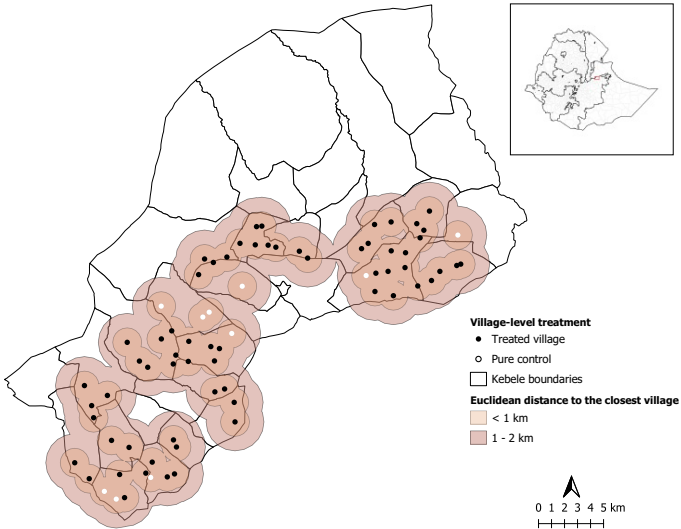


Experimental design

Households were randomised into three groups:

1. Treatment (691 individuals)
   - 2 tickets (head and spouse) to view mini-documentaries
   - 4 x 15 minute documentaries (2 men, 2 women) = 1 hour in Oromiffa
   - Examples on Future in Mind YouTube channel
2. Placebo (717 individuals)
   - Local Ethiopian end-of-year TV show in 15 minute segments
3. Within village control (707 individuals)
   - No treatment
   - Surveyed
4. Pure control (360 individuals)
   - Only surveyed at endline (Bidwell et al., 2016; Zwane et al. 2011).

Geographic distribution of villages



Specification

Focus on within-village results: few spillovers or effects of exposure to outsiders

$$y_{iv} = \alpha + \gamma T_i + \rho P_i + X'_{i1}\pi + \tau_v + \eta_i \tag{1}$$

- For 64 villages after 5 years (and 6 months)
- X'_i = controls for demographics; τ_v = village fixed effects
- $\gamma - \rho$ = effect of content of video
- Attrition is low (9.6% of individuals after 5 years) and not predicted by treatment status or demographics ▸ Attrition
- Non-compliance of only 2% of treated individuals ▸ Non-compliance

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Results on summary indices (Anderson, 2008)

	After 5 years (1) Treatment	(2) Placebo	(3) Treat. vs. placebo	(4) Control mean (SD) Total obs.
Agricultural investment index	0.20***	0.05	0.15**	0.00
	(0.07)	(0.07)	(0.07)	(1.00)
	[0.00]***	[0.67]	[0.03]**	1089
Educational investment index	0.43***	0.06	0.37***	-0.00
	(0.10)	(0.08)	(0.10)	(1.00)
	[0.00]***	[0.67]	[0.00]***	1089
Welfare index	0.20***	0.09	0.12*	0.00
	(0.07)	(0.07)	(0.06)	(1.00)
	[0.00]***	[0.67]	[0.06]*	1091

Notes: OLS estimates of within-village treatment effects after 5 years (columns 1-2). Column 3 tests for differences in parameters obtained in first two columns. Stars on the coefficient estimates reflect unadjusted p-values. Minimum q-values are in square brackets. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Column 4 displays the control mean, standard deviation, and total number of observations. The outcomes are Anderson (2008) indices, standardised relative to the within-village control group.

Agricultural investment index (1/3): Increases in labour effort

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Daily minutes working	**55.91****	9.47	**46.45***	750.26
	(23.88)	(24.64)	(24.98)	(316.21)
	[0.04]**	[0.70]	**[0.13]**	1075
Daily minutes in leisure	0.66	-34.67	35.33	1979.38
	(55.91)	(53.70)	(56.79)	(754.33)
	[0.99]	[0.70]	[0.53]	1076

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Agricultural investment index (2/3): Increases on the extensive margin and fertiliser spending

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
% with any spending on modern crop inputs	**0.10*****	0.04	**0.06***	0.58
	(0.03)	(0.03)	(0.03)	(0.49)
	[0.01]**	[0.58]	**[0.24]**	1089
Spending on seed or fertiliser (USD) PPP	**7.28****	3.78	**3.50**	33.49
	(3.07)	(3.32)	(3.31)	(43.54)
	[0.04]**	[0.58]	**[0.40]**	1078
% with any spending on feed or vet supplies	**0.10*****	-0.04	**0.14*****	0.45
	(0.03)	(0.03)	(0.03)	(0.50)
	[0.01]**	[0.58]	**[0.00]*****	1089
Spending on feed or vet supplies (USD) PPP	2.66	-1.87	4.52	29.30
	(4.80)	(4.81)	(4.63)	(70.92)
	[0.66]	[0.91]	[0.40]	1081
% with any spending on hired crop labour	**-0.05****	-0.03	**-0.03**	0.36
	(0.02)	(0.02)	(0.02)	(0.48)
	[0.04]**	[0.58]	**[0.40]**	1089
Spending on crop hired labour (USD) PPP	-1.27	-5.02	3.75	54.16
	(5.45)	(5.51)	(5.42)	(93.01)
	[0.82]	[0.58]	[0.49]	1078
Days of family labour on crops during previous season	**5.85***	0.16	**5.69***	61.13
	(3.15)	(3.06)	(3.21)	(40.68)
	[0.10]	[0.96]	**[0.24]**	1080
Area cultivated (hectares)	0.01	-0.01	0.02	0.55
	(0.02)	(0.02)	(0.02)	(0.30)
	[0.66]	[0.91]	[0.40]	1071

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Agricultural investment index (3/3): Increases in productive assets

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Value of livestock (USD) PPP	**184.58**	-124.53	**309.11****	2018.22
	(135.92)	(130.92)	(130.43)	(1921.09)
	[0.17]	[0.34]	**[0.04]****	1080
Value of tools (USD) PPP	**27.51****	12.06	**15.44**	106.02
	(11.60)	(12.35)	(13.66)	(126.90)
	[0.04]**	[0.34]	**[0.26]**	1077
Summary index:				
Agricultural investment index	0.20***	0.05	0.15**	0.00
	(0.07)	(0.07)	(0.07)	(1.00)
	[0.00]***	[0.67]	[0.03]**	1089

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What drives the effect in the education and welfare indices?

Human capital:

- Increased enrolment, attainment (almost doubling), and time spent in school or studying among those aged 11-15 at time of the video
- Educational spending by about 8 USD PPP (though not robust to ANCOVA)

Quality of life:

Small **increases in non-durable consumption** (about 39 USD PPP in last 12 months, 19% of control mean)

Improvements in value of house, housing quality (non-organic roof, own toilet)

A small **reduction in the reported months of food insecurity**

Small increases in subjective well-being (not consistent with frustration, but not statistically significant)

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Early economic changes six months after the video

Savings: After six months, people had more savings (increase of 20 USD PPP, 71% of control mean)

Labour supply: 40 minutes per household per day more on the farm

Educational investments: Spending had already increased (13% of control mean) and enrolment increased marginally among children aged 7-15 (11% of control mean)

Plausible mechanism: Shift in aspirations and expectations

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Summary index:				
Reference-point index	0.18***	-0.01	0.20***	0.01
	(0.06)	(0.06)	(0.06)	(1.00)
	[0.00]***	[0.80]	[0.00]***	1955

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Components of reference-point index

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Aspirations: what would you like to achieve?				
Aspirations Anderson index	0.12**	-0.04	0.16***	0.02
	(0.06)	(0.06)	(0.06)	(1.00)
	[0.06]*	[0.89]	[0.01]**	1955
Expectations: what do you expect in ten years?				
Expectations Anderson index	0.21***	-0.01	0.21***	0.00
	(0.06)	(0.06)	(0.06)	(1.00)
	[0.00]***	[0.89]	[0.00]***	1954
Maxima: What is the maximum level of ... that a person can have in your village?				
Maxima Anderson index	0.12*	0.03	0.09	0.00
	(0.06)	(0.06)	(0.07)	(0.99)
	[0.06]*	[0.89]	[0.16]	1955

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Can alternative mechanisms explain this?

Are the videos giving out **new concrete information?**

- No effect on whether households undertake specific behaviours included in the videos
- Effects also occur on variables not covered in the videos e.g. education aspirations; education investment

No effect on preferences: time preferences, risk aversion at midline and endline

Not through locus of control or self-esteem in the long term

No or only very small spillovers detected across three different specifications.

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Key contribution: A light touch intervention changes aspirations and behaviour persistently

After 5 years, a role-model video intervention lead to

1. Changes in economic behaviour
   - Improvement in children's **education spending and attainment**
   - Increase in spending on **agricultural inputs** (fertiliser, seeds)
   - Small changes in savings in the short run, translating into increases in **stock of productive assets**
   - Small (future-oriented) changes in consumption: non-food consumption, food security and housing quality
2. Increases in **aspirations and expectations**, especially for children's education

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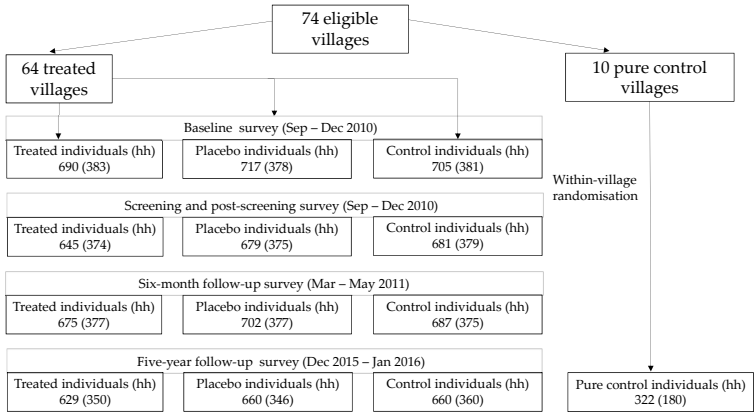
Appendix

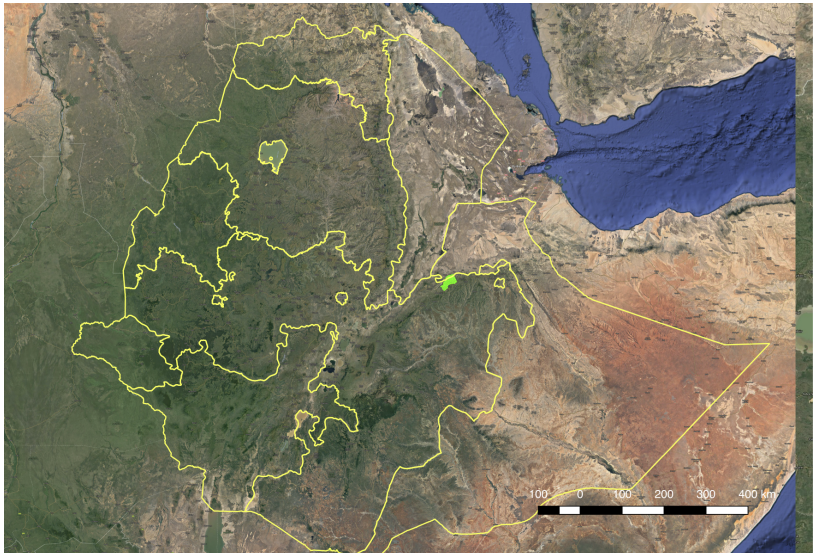
Non-compliance

	Individuals					Households				
	All villages	Treatment	Placebo	Within-village control	Pure control	All villages	Treatment	Placebo	Within-village control	Pure control
Number of villages	74		64		10	74		64		10
Observations										
In sample	2434	690	717	705	322	1322	383	378	381	180
Given tickets	2112	690	717	705	0	1142	383	378	381	0
Compliers	2070	673	698	699	0	1116	371	368	377	0
Non-compliers	42	17	19	6	0	26	12	10	4	0
of which										
At wrong screening	20	3	11	6	0	11	2	5	4	0
Missed screening	22	14	8	0	0	15	10	5	0	0
_										
% of non-compliers	.06	**.025**	.026	.009	0	.067	.031	.026	.01	0

Attrition across surveys



Setting: Doba district, Ethiopia



Educational gains in children aged 11-15 at the time of the video

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Children aged 16-20 in school	**0.11***	-0.02	**0.12***	0.33
	(0.06)	(0.06)	(0.07)	(0.78)
	[0.10]*	[0.97]	**[0.09]***	1078
Daily minutes in school for children aged 16-20	**30.48****	0.46	**30.01****	58.64
	(12.90)	(11.36)	(13.26)	(149.88)
	[0.04]**	[0.97]	**[0.05]****	1077
Daily minutes studying for children aged 16-20	**7.85***	0.58	**7.27**	17.82
	(4.51)	(4.25)	(4.90)	(52.12)
	[0.10]*	[0.97]	**[0.14]**	1070
Children aged 16-20 that attained 8th grade	**0.08*****	0.01	**0.07****	0.07
	(0.03)	(0.02)	(0.03)	(0.26)
	[0.01]***	[0.97]	**[0.05]****	1078
For all children				
Schooling expenditure (USD) PPP	**8.17*****	1.29	**6.88****	19.17
	(2.86)	(2.54)	(3.06)	(32.73)
	[0.00]***	[0.61]	**[0.02]****	1074

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel. We also control for the number of children aged 0-15 at baseline.

Small/no changes for children aged 2-10 at the time of the video

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Children aged 7-15 in school	0.00	-0.11	0.11	2.34
	(0.14)	(0.13)	(0.13)	(2.26)
	[0.99]	[0.50]	[0.38]	1078
Daily minutes in school for children aged 7-15	11.00	-34.46	45.46*	527.12
	(25.85)	(25.14)	(25.31)	(437.21)
	[0.99]	[0.50]	[0.22]	1068
Daily minutes studying for children aged 7-15	14.98*	5.52	9.46	91.29
	(8.36)	(8.09)	(8.57)	(115.61)
	[0.22]	[0.50]	[0.38]	1069

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel. We also control for the number of children aged 0-15 at baseline.

Household welfare: Consumption

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Food consumption (USD) per ad. equiv. monthly PPP	-1.97	-2.30	0.32	53.91
	(2.05)	(1.92)	(2.07)	(29.98)
	[0.42]	[0.39]	[0.88]	1076
Frequent non-food (1m recall USD) per ad. equiv. PPP	0.44	0.04	0.40	4.08
	(0.28)	(0.28)	(0.30)	(3.69)
	[0.29]	[0.95]	[0.22]	1076
Nonfood consumption (12m recall USD) per ad. equiv. monthly PPP	0.70	-0.54	1.24**	7.47
	(0.51)	(0.43)	(0.48)	(6.35)
	[0.29]	[0.39]	[0.05]*	1079
Consumption of sin goods (USD) PPP	0.05	-0.28	0.33*	1.12
	(0.25)	(0.23)	(0.17)	(3.92)
	[0.85]	[0.39]	[0.14]	1088
General economic position (scale 1 to 4)	0.09*	0.00	0.09*	2.10
	(0.05)	(0.05)	(0.05)	(0.73)
	[0.29]	[0.95]	[0.14]	1088

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Household welfare: Housing quality

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Value of durable assets excluding tools (USD) PPP	21.87**	-3.05	24.93**	70.55
	(10.74)	(9.22)	(11.18)	(127.39)
	[0.05]*	[0.74]	[0.05]*	1077
Value of house (USD) PPP	412.38***	62.20	350.18***	1384.27
	(93.87)	(87.04)	(93.47)	(1235.57)
	[0.00]***	[0.63]	[0.00]***	1076
Non-organic roof	0.06**	0.04	0.02	0.68
	(0.03)	(0.03)	(0.03)	(0.47)
	[0.05]*	[0.39]	[0.49]	1087
Own toilet	0.07*	0.04	0.02	0.38
	(0.03)	(0.03)	(0.03)	(0.49)
	[0.05]*	[0.39]	[0.49]	1088

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Household welfare: Food security

Food security items from USAID surveys (Bickel et al. 2000)

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Food security index: z-score	-0.08	-0.12*	0.04	0.05
	(0.07)	(0.07)	(0.07)	(1.05)
	[0.27]	[0.16]	[0.52]	1084
Months of food insecurity	-0.32**	0.03	-0.35**	2.71
	(0.14)	(0.15)	(0.14)	(2.13)
	[0.05]*	[0.84]	[0.03]**	1088

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Household welfare: Subjective well-being

After five years	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Best life	0.23**	0.06	0.17	4.83
	(0.11)	(0.11)	(0.12)	(1.80)
	[0.09]*	[0.61]	[0.28]	1909
Happiest life	0.11	0.12	-0.01	6.05
	(0.14)	(0.14)	(0.14)	(2.19)
	[0.42]	[0.61]	[0.95]	1909
Summary index:				
Welfare index	0.20***	0.09	0.12*	0.00
	(0.07)	(0.07)	(0.06)	(1.00)
	[0.00]***	[0.67]	[0.06]*	1091
Aggregate index:				
Omnibus index	0.31***	0.04	0.27***	0.01
	(0.06)	(0.06)	(0.06)	(0.99)
				1976

Notes: The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2016 USD PPP. Robust standard errors are in parentheses. Minimum q-values in square brackets, run over each panel.

Measures of sense of control over one's own life

- **Locus of control** from social psychology (Heckman et al., 2006, 2012) IPC scale (Levenson, 1981)
  - Internality - people see outcomes as contingent on individual behaviour
  - Chance scale - chance or fate determines outcomes
- **Attributions for Poverty scale** from sociology (Feagin, 1972, 1975)
  - The characteristics of individuals cause their poverty
  - Fate causes poverty

No changes: Locus of control

	Short Run				Long Run			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Internal locus of control	0.23*	-0.06	0.28**	12.94	-0.04	0.05	-0.09	12.27
	(0.12)	(0.12)	(0.12)	(2.09)	(0.11)	(0.11)	(0.12)	(1.91)
	[0.23]	[0.91]	[0.14]	2014	[0.94]	[0.97]	[0.90]	1887
Individual causes of poverty	0.22	0.17	0.05	9.20	0.01	-0.01	0.02	9.15
	(0.14)	(0.14)	(0.14)	(2.39)	(0.14)	(0.13)	(0.13)	(2.03)
	[0.23]	[0.62]	[0.87]	2013	[0.95]	[0.97]	[0.90]	1887
Chance locus of control	-0.00	-0.02	0.01	13.33	0.04	-0.07	0.11	12.66
	(0.17)	(0.16)	(0.17)	(2.70)	(0.15)	(0.15)	(0.15)	(2.35)
	[0.98]	[0.91]	[0.94]	2011	[0.94]	[0.97]	[0.90]	1887
Fate causes of poverty	-0.26*	0.02	-0.29*	7.40	-0.03	-0.00	-0.03	6.85
	(0.16)	(0.15)	(0.15)	(2.65)	(0.12)	(0.12)	(0.12)	(2.05)
	[0.23]	[0.91]	[0.19]	2012	[0.94]	[0.97]	[0.90]	1887
Structural causes of poverty	0.16	0.35**	-0.19	12.79	-0.08	-0.04	-0.05	12.67
	(0.18)	(0.17)	(0.17)	(2.85)	(0.14)	(0.15)	(0.15)	(2.37)
	[0.55]	[0.26]	[0.56]	2004	[0.94]	[0.97]	[0.90]	1887
Others locus of control	-0.05	0.04	-0.09	12.60	0.18	0.03	0.15	12.46
	(0.18)	(0.17)	(0.17)	(3.18)	(0.16)	(0.17)	(0.17)	(2.79)
	[0.94]	[0.91]	[0.87]	2009	[0.94]	[0.97]	[0.90]	1887

*Notes:*The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Standard errors are clustered at household level. Standard errors are in parentheses. Minimum q-values in brackets.

No changes: Preferences

	Short Run (1)	(2)	(3)	(4)	Long Run (5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Risk aversion: coin	-0.10	0.00	-0.10*	1.26	0.01	0.05	-0.05	1.81
	(0.06)	(0.06)	(0.06)	(1.13)	(0.08)	(0.08)	(0.08)	(1.28)
	[0.50]	[0.97]	[0.23]	2035	[0.94]	[0.71]	[0.68]	1887
Risk aversion: market	-0.05	0.06	-0.12*	1.25	-0.03	0.03	-0.05	1.82
	(0.06)	(0.06)	(0.06)	(1.16)	(0.08)	(0.07)	(0.08)	(1.26)
	[0.83]	[0.73]	[0.23]	2035	[0.91]	[0.71]	[0.68]	1887
Impatient	0.01	0.02	-0.01	0.70	0.01	0.01	0.00	0.82
	(0.03)	(0.02)	(0.02)	(0.46)	(0.02)	(0.02)	(0.02)	(0.39)
	[0.83]	[0.85]	[0.82]	2037	[0.91]	[0.71]	[0.88]	1920
Present-biased	0.01	0.03	-0.02	0.33	0.03	0.05*	-0.02	0.53
	(0.03)	(0.03)	(0.03)	(0.47)	(0.03)	(0.03)	(0.03)	(0.50)
	[0.83]	[0.73]	[0.74]	2012	[0.76]	[0.31]	[0.68]	1887
Future-biased	0.01	0.01	0.00	0.22	-0.04*	-0.02	-0.02	0.18
	(0.02)	(0.02)	(0.02)	(0.41)	(0.02)	(0.02)	(0.02)	(0.39)
	[0.83]	[0.93]	[0.97]	2012	[0.25]	[0.71]	[0.68]	1887

*Notes:*The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Standard errors are clustered at household level. Standard errors are in parentheses. Minimum q-values in brackets.

No changes: Information

	Long Run			
	(1)	(2)	(3)	(4)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Information index	0.00	0.01	-0.01	0.05
	(0.02)	(0.02)	(0.02)	(0.31)
	[0.85]	[0.57]	[0.69]	999

*Notes:*The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Robust standard errors are in parentheses. Minimum q-values in brackets.

Spillovers: Pure control village as reference group

	After 5 years (1) Treatment	(2) Placebo	(3) Control	(4) Treat. vs. placebo	(5) Treat. vs. control	(6) Placebo. vs. control	(7) Pure Control mean (SD) Total obs.
Summary indices:							
Reference-point index	0.25***	0.07	0.07	0.18***	0.18**	-0.00	-0.00
	(0.09)	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)	(1.00)
	[0.01]**	[0.85]	[0.41]	[0.02]**	[0.04]**	[0.99]	2231
Agricultural investment index	0.13	-0.01	-0.09	0.14*	0.23***	0.09	-0.00
	(0.13)	(0.11)	(0.11)	(0.08)	(0.07)	(0.07)	(1.00)
	[0.41]	[0.94]	[0.41]	[0.13]	[0.00]***	[0.43]	1223
Education investment index	0.46***	0.18**	0.13*	0.28***	0.32***	0.04	-0.00
	(0.09)	(0.08)	(0.08)	(0.09)	(0.09)	(0.07)	(1.00)
	[0.00]***	[0.10]*	[0.39]	[0.01]***	[0.00]***	[0.76]	1223
Welfare index	-0.05	0.05	-0.23	-0.10	0.19	0.29	0.00
	(0.14)	(0.14)	(0.18)	(0.12)	(0.18)	(0.20)	(1.00)
	[0.75]	[0.93]	[0.40]	[0.41]	[0.31]	[0.43]	1224
Aggregate index:							
Overall Anderson index	0.25***	0.06	-0.03	0.19***	0.29***	0.09	0.00
	(0.09)	(0.08)	(0.07)	(0.07)	(0.07)	(0.06)	(1.00)
							2251

Notes: OLS estimates of between-village effects after 5 years (columns 1, 2 and 3). Column 4 tests for differences in parameters obtained in first two columns. Column 5 tests for differences in parameters obtained in first and third columns. Column 6 tests for differences in parameters obtained in second and third columns.

Spillovers: Exploiting randomised saturation

	After 5 years (1) Treatment #Treatment-intense	(2) Treatment #Placebo-intense	(3) Control #Treatment-intense	(4) Control #Placebo-intense	(5) Placebo #Treatment-intense	(6) Placebo #Placebo-intense	(7) Treat #Treat-intense vs. Treate #Placebo-intense	(8) Control #Treat-intense vs. Control #Placebo-intense	(9) Placebo #Treat-intense vs. Placebo #Placebo-intense	(10) Pure Control mean (SD) Total obs.
Summary indices:										
Reference-point index	0.13	0.22*	0.07	0.06	0.01	-0.04	-0.10	0.02	0.05	-0.00
	(0.10)	(0.12)	(0.09)	(0.10)	(0.12)	(0.12)	(0.16)	(0.09)	(0.20)	(1.00)
	[0.27]	[0.09]*	[0.52]	[0.55]	[0.91]	[0.76]	[0.98]	[0.97]	[0.81]	2231
Agricultural investment index	0.18**	0.27**	-0.05	-0.14	0.24	0.03	-0.09	0.09	0.21	-0.00
	(0.09)	(0.11)	(0.12)	(0.11)	(0.16)	(0.08)	(0.14)	(0.08)	(0.20)	(1.00)
	[0.08]*	[0.04]**	[0.65]	[0.42]	[0.32]	[0.76]	[0.98]	[0.97]	[0.48]	1223
Educational investment index	0.32***	0.32**	0.13	0.14	-0.15	0.05	0.00	-0.00	-0.20	-0.00
	(0.12)	(0.13)	(0.09)	(0.10)	(0.14)	(0.11)	(0.18)	(0.11)	(0.21)	(1.00)
	[0.03]**	[0.04]**	[0.51]	[0.42]	[0.37]	[0.76]	[1.00]	[0.97]	[0.48]	1223
Welfare index	0.25	0.12	-0.30	-0.16	0.54	0.10	0.12	-0.14	0.43	0.00
	(0.33)	(0.15)	(0.27)	(0.16)	(0.38)	(0.18)	(0.37)	(0.26)	(0.45)	(1.00)
	[0.46]	[0.40]	[0.51]	[0.42]	[0.32]	[0.76]	[0.98]	[0.97]	[0.48]	1224
Aggregate index:										
Omnibus index	0.22**	0.34***	-0.02	-0.06	0.20*	0.02	-0.12	0.04	0.18	0.00
	(0.09)	(0.11)	(0.09)	(0.08)	(0.12)	(0.09)	(0.14)	(0.08)	(0.17)	(1.00)
										2251

Notes: OLS estimates of between-village effects after 5 years (columns 1-6). Column 7 tests for differences in parameters obtained in first two columns. Column 8 tests for differences in parameters obtained in columns third and fourth. Column 9 tests for differences in parameters obtained in fifth and sixth columns. Outcome variables are listed on the left, and described in detail in the Appendix. The unit of observation is the household. Regressions do not control for baseline outcomes. Standard errors are in parentheses and are clustered at village level. Stars on the coefficient estimates reflect unadjusted *p*-values. Minimum *q*-values are in square brackets and are calculated over each panel of variables. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Column 10 displays the mean, standard deviation for the pure-control group, and total number of observations. The outcomes are **?** indices, standardised relative to the pure-control group. The reference-point index is made of the reported income, wealth and years of education for children, for aspirations, expectations, and for the maximum possible within the village. The agricultural investment index includes all outcomes reported in table **??**, with daily minutes in leisure being recoded to be negative. The educational investment index includes all outcomes reported in table **??**. The welfare index includes all outcomes reported in table **??**, with the food insecurity index, months of food insecurity in the last year, and consumption of sin goods recoded to be negative. The omnibus index aggregates the four standardised indices into a single index, following **?** and **?**.

Spillovers: Between-villages

	After 5 years				
	(1) Omnibus index	(2) Reference-point index	(3) Agricultural investment index	(4) Educational investment index	(5) Welfare index
1 if treated (i.e. watched documentary)	0.2840***	0.3130***	0.1060	0.1083	-0.1283
	(0.0864)	(0.0749)	(0.1242)	(0.0812)	(0.1460)
1 if placebo (i.e. watched entertainment videos)	0.0934	0.1386**	-0.0405	-0.0588	-0.0309
	(0.0708)	(0.0661)	(0.1020)	(0.0755)	(0.1350)
1 if control	0.0018	0.1434**	-0.1203	-0.0497	-0.3176
	(0.0720)	(0.0667)	(0.1071)	(0.0659)	(0.1971)
Households invited to documentary within 0-1km including own-village	-0.0014	-0.0037**	0.0029	-0.0014	0.0060*
	(0.0019)	(0.0017)	(0.0028)	(0.0020)	(0.0034)
Villages within 0-1km including own-village	-0.1066***	-0.1089***	-0.1206**	-0.0201	-0.0650
	(0.0401)	(0.0370)	(0.0569)	(0.0463)	(0.1120)
Regression type	Within km	Within km	Within km	Within km	Within km
# Obs.	2251	2231	1224	1220	1225
P-value: Treat = Placebo	.005	.007	.086	.01	.416
P-value: Treat = Control	0	.03	.001	.006	.302
P-value: Placebo = Control	.108	.943	.214	.857	.143
Pure control group mean	0.00	0.00	0.00	0.00	0.00
Pure control group st. dev.	1.00	1.00	1.00	1.00	1.00

Notes: OLS estimates of between-village effects after 5 years, controlling for exogenous spatial treatment intensity. Each column represents a separate regression.
The first three rows represent coefficients on household-level indicators for treatment assignment. The fourth row reports estimates of the coefficient δ_2^d from equation **??** that calculate the effect of every additional household invited to the intervention within a radius of 0-1km of the observation. The radius of 0-1km was selected after running a series of nested models as in **?**, selecting the model that minimised the Bayesian Information Criterion across all models for each outcome. The p-values on the bottom are obtained from tests for differences in parameters obtained in first three rows.
Outcome variables are listed across columns. The unit of observation is the individual for columns (1) and (2), the household for the remaining outcomes. Regressions control for screening fixed effects and pre-specified village-level controls. Regressions do not control for baseline outcomes. **?** standard errors are in parentheses, accounting for spatial correlation within a 1km radius. Stars on the coefficient estimates reflect unadjusted *p*-values. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Bottom rows displays the mean, standard deviation for the pure-control group, and total number of observations.
The outcomes are **?** indices, standardised relative to the pure-control group. The omnibus index aggregates the four standardised indices into a single index, following **?** and **?**. The