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Parental aspirations for children's education – is there a “girl effect”? Experimental evidence from rural Ethiopia

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Outline

- ❑ Motivation
- ❑ Questions
- ❑ Some Theory
- ❑ A five-year evaluation of a field experiment
 - Design;
 - Findings – summarize results related to aspirations, beliefs, and future-oriented behaviour;
- ❑ The ‘girl effect’
 - Is there a ‘girl effect’?
 - Two differences from the published version
 - Long-term effect added;
 - Analysis restricted to households with children;

Motivation

- ❑ Poor people in developing countries often *do not invest, even when returns are high*: opportunity vs. ‘ability’ to use opportunity
- ❑ People may form beliefs that they are *unable to improve* their economic position:
 - *Example 1*: Rahmato and Kidanu, 1999
“It is a life of no thought for tomorrow”, “We have neither a dream nor an imagination”
 - *Example 2*: Taffesse and Tadesse (2017) – LoC and propensity to adopt modern farm inputs;
- ❑ Limit effort, investment, uptake of new technologies;;



Questions, Definition, Relevance

□ Questions:

- *Are low aspirations a possible explanation?*
- *Can aspirations be changed persistently?*

□ Aspirations

- *forward-looking goals* or targets (Locke and Latham, 2002).
 - *bounds among individuals' preferences*, the elements of the choice sets which they consider as relevant for them and motivate their actions.
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- important – **motivators, heterogenous;**

A Theoretical Framework

$$\text{Max}_{\{c_t, l_t, w_t\}_{t=0}^{\infty}} V = E \sum_{t=0}^{\infty} \beta^t u(c_t, l_t)$$

subject to:

$$A_{t+1} = \left[r_{t+1}(1 - w_t)(A_t - c_t) + f\left(w_t(A_t - c_t), T - l_t\right) \right]$$
$$\bar{q} = f\left(w_t(A_t - c_t), T - l_t\right)$$

- Agnostic about why aspirations are lower:
- Bellman equation, FoCs, the envelope theorem ultimately lead to the following solution



A Theoretical Framework

$$(1) \quad w_t = \beta E_t[(u_{c_{t+1}} - \lambda_{t+1}) \cdot f_{l_t}]$$

$$(2) \quad r_{t+1} \cdot E_t u_{c_{t+1}} = E_t[f_{k_t} \cdot (u_{c_{t+1}} - \lambda_{t+1})]$$

$$(3) \quad u_{c_t} = \beta E_t[w_t \cdot f_{k_t} \cdot (u_{c_{t+1}} - \lambda_{t+1}) + r_{t+1} \cdot (1 - w_t) \cdot u_{c_{t+1}}]$$

λ_{t+1} = the shadow cost of the aspirations constraint

- as if the *marginal benefit of using leisure in the form of effort is lower* – incentives for more leisure and less effort;
- as if the *return to the productive activity is lower* – incentive to invest in the effortless asset than the productive activity;
- as if the *risky productive activity gets a lower weight*, as if the overall return to investing in the future should be valued lower than when the aspirations constraint is not binding;

A Theoretical Framework

Why low aspirations?

- ❑ *Origin 1 – lack of (Jensen (2010)) or inattention (Hanna, Mullainathan, and Schwartzstein (2014)) to relevant information*

Assessment: no specific information on returns in the experimental design; tests whether any specific information to which subjects are exposed via the videos matters or not;

- ❑ *Origin 2 – low perceived probability of success*
- ❑ *Origin 3 – beliefs about oneself and aspirations are shaped by society, an individual's past experiences, persuasion, or all three.*

Assessment: important channels – intervention is exposure to potential role models (persuasion and a social channel).



Experimental setting: Doba woreda

❑ Rural, isolated, poor district

- Only 1.5 per cent of Doba's population urban; 99% were subsistence farmers growing sorghum and maize (Central Statistical Agency, 2007)
- Selected for the national Productive Safety Net Program (PSNP) in 2005
- 60% of population had only seen TV once in the last year or never

❑ Limited market economy

- 96% of sample households in agriculture, all own some livestock
- Only 10% rent land, 36% hire any labour
- Only 47% use any modern agricultural technology

❑ Note: external validity of the point estimates



Experimental design: village level

□ *Village level-randomization:*

- 84 villages randomly selected from woreda village list (from among those with 50-100 HHs to ensure equal size);
- Treatment villages (64 villages, ~36 people per village, = 2,115)
- Pure control villages (20 villages ~30 people per village, = 631) (*Only at end-line*).



Experimental design: within villages

- Within 64 treatment villages – *households randomly selected from a complete listing of village households;*
 - Treatment (~12 people per village = 691)
 - *Ticket to view 4 x 15-minute documentaries (2 men, 2 women) in Oromiffa;*
 - *Documentaries specifically produced for the experiment;*
 - *Examples on Oxford University YouTube*
<https://www.youtube.com/channel/UCqfoNjCzt8YPjTRWQaMQfAg;>
 - Placebo (~12 people per village = 717)
(Local Ethiopian TV show)
- Within-village control (~12 people per village = 707)



Measures – aspirations, expectations

❑ *Four dimensions:*

- Annual income in cash
- Assets: house, furniture, other consumer durables goods, vehicles
- Social status: do villagers ask for advice
- Level of education of eldest child

❑ *Aspirations, Expectations:*

- What is the level of ___ that you would like to achieve?
- What is the level of ___ that you think you will reach within ten years?

❑ Testing – Usability, Reliability, and Validity of the Aspiration Measure (Bernard and Taffesse (2014));

❑ *Overall aspiration index:*

$$A_i = \sum_k w_i^k \left(\frac{a_i^k - \mu_k}{\sigma_k} \right)$$

a_i^k = individual i 's aspiration response to dimension k .

w_i^k = weight individual i assigned to dimension k .

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μ_k, σ_k = village sample mean and standard deviation for dimension k .

Approach

- ❑ **Measurement** – develop a survey instrument – *four domains*;
- ❑ **Identification** – aspirations and choice/behavior are interlinked;
 - **Randomize field experiment (an RCT):**
 - *exogeneous/external shock to aspirations* in a remote rural district of Ethiopia using ‘role model’ documentaries;
 - No other intervention – incentives, material support, specific information/advice;
 - *Treatment* – watch ‘role model’ documentaries;
 - *Placebo* – watch Ethiopian TV entertainment programmes;
 - *Control I* – survey within-treatment-village controls;
 - *Control II* – survey pure controls (after five years).

Experimental design: individual treatment

- 64 villages. Random selection of 6 treatment HH, 6 placebo HH, 6 control HH. Head and spouse treated.
- 3 arms:
 - **Treatment:** ticket to view mini-documentaries about similar people who were successful in agriculture or small business.
 - No other intervention.
 - 4 x 15 minute documentaries (2 men, 2 women) = 1 hour in Oromiffa
 - Examples on CSAE Oxford YouTube channel
 - **Placebo:** local Ethiopian TV show in 15 minute segments.
 - **Control:**
 - *within-village:* surveyed at their home.
 - *pure:* non-treatment village.

Timeline

- ❑ **3 main rounds of surveys**
 - Baseline (Sept-Dec 2010),
 - Aspirations/expectations immediately after treatment
 - Follow-up (Mar-May 2011)
 - End-line (Dec 2015-Jan 2016)
- ❑ **Pure control**
 - Endline (Dec 2015-Jan 2016)
- ❑ **Sample** – in a one woreda (district)

All villages Treatment villages Pure control villages (round 3)

Number of villages	84	64	20
<hr/>			
Individuals			
In sample	2746	2115	631
Given tickets	2115	2115	0

Non-compliance and attrition

- ❑ Non-compliance is very limited (2% of treated individuals).
- ❑ Attrition is small (9.6% of individuals) for a five-year follow-up.
 - younger individuals appear to attrite more;
 - attrition, treatment status and outcomes are not correlated;
 - analysis is conducted on 1,898 individuals: all respondents in treatment villages surveyed in all three rounds and respondents in pure control villages surveyed in the end-line.



Balance

□ Individual level

- Balanced within treatment villages at baseline.
- Balanced on demographics/assets at endline across all four groups

□ Village level

- Treatment and pure control villages are balanced on 30 of 33 endline village characteristics (specified in PAP).
- Treatment and pure control villages are balanced on 6 characteristics from GPS data at baseline.

	Mean	SD	p-value*
Altitude (m)	1,884.85	134.504	.59
Distance to city	11,916.88	3,003.45	.76
Distance to health centre	9,921.81	4,523.4	.66
Distance to market place	10,246.1	3,683.94	.995
Distance to river	2,598.62	1,633.69	.28
Distance to road	5,950.98	3,252.57	.29

* Treatment=Control

Summary: Findings

- ❑ Find small changes
 - **Aspirations and expectations**, especially for children's education – *higher after 6 months (persists over 5 years)*
 - **Internal locus of control** – *increases after 6 months (does not persist over 5 years)*
- ❑ Small but significant changes in **future-oriented behaviour**
 - Savings, credit *increase after six months (do not persist)*;
 - Child school enrolment and spending on schooling *increase after six months (persist after 5 years)*
 - Small increases in spending on agricultural inputs (seeds and fertilizer and land rented) (*tested only after 5 years*)
- ❑ Small changes in **welfare**: stock of assets; durables consumption (*tested only after 5 years*)
- ❑ **Spill-over effects** on variables - children's school enrolment, investment in crops and livestock, and consumption (*after 5 years*)

Summary: Contributions/caveats

- ❑ **Clear link** from exposure to potential role models to changes in **aspirations/beliefs** and **outcomes**.
 - Build on work on exposure to female role models (Beaman et al., 2012; and others).
 - **No other intervention; experimental design.**
 - **Placebo:** control for effects of exposure to media, gathering.
 - **Provide little to no concrete new information** (unlike Jensen, 2010, 2012).
- ❑ Long run follow up;
- ❑ Examine **spillovers** - within-village controls pure control villages;

Caveat

- ❑ *How aspirations are formed or why they are lower among the poor* (Dalton et al. 2016 vs Genicot and Ray 2017));
- ❑ *External validity* of point estimates of effects in a less remote contexts;

Education: 'girl effect'

□ Specifications (impact on educational aspirations and investments)

▪ Difference at baseline

$$(1) \quad Y_0^{ih} = \alpha_1 + \delta_1 \cdot Girl^{ih} + \theta_1 \cdot X_0^{ihv} + \varepsilon_1^{ih}.$$

▪ Treatment effect (ITT)

$$(2) \quad Y_1^{ih} = \alpha_2 + \beta_2 \cdot Treat^{ih} + \theta_2 \cdot X_0^{ihv} + \varepsilon_2^{ih}.$$

▪ 'Girl effect' – number of girls in total number of children

$$(3) \quad Y_1^{ih} = \alpha_3 + \beta_3 \cdot Treat^{ih} + \delta_3 \cdot Girl^{ih} \\ + \gamma_3 \cdot Treat^{ih} \times Girl^{ih} \\ + \theta_3 \cdot X_0^{ihv} + \varepsilon_3^{ih}.$$

▪ Heterogeneity – gender of the respondent, education level of the respondent (interaction terms)

Education Aspiration effects by gender

- ❑ Mean educational aspiration – about *half-a-year* lower for girls;
- ❑ Aspirations beyond secondary education – *9 percentage points* (or *15 percent*) lower for girls.
- ❑ **Positive impact on overall educational aspirations,**
- ❑ **No impact towards reducing the gender differential.**

	<u>Baseline</u>		<u>Short-run</u>		<u>Long-run</u>	
	<i>Mean</i>	<i>Difference for girls</i>	<i>Treatment effect</i>	<i>Difference for girls</i>	<i>Treatment effect</i>	<i>Difference for girls</i>
Aspirations for education (years)						
<i>Mean/Coefficient</i>	14.08	-0.47***	0.27*	-0.1	0.28*	0.09
<i>SD/SE</i>	2.42	0.11	0.15	0.27	0.16	0.29
[=1] if aspires beyond secondary education						
<i>Mean/Coefficient</i>	0.6	-0.09***	0.05*	-0.03	0.05*	0.01
<i>SD/SE</i>	0.49	0.02	0.03	0.05	0.03	0.05
Observations	1970		1932		1780	

Notes: * denotes significance at 10 percent, ** at 5 percent, and *** at 1 percent level. The unit of observation is the individual parent. Sample is restricted to households with children aged 6-20. Figures in 2015 USD. We examine difference in means and treatment effects if the eldest child is a girl. Standard errors are clustered at household level.

Education Investment effects by gender

- ❑ Positive impact on all educational investment measures
- ❑ No impact towards reducing the gender differential in educational investment.

<i>Educational investments by gender</i>	Baseline <i>Mean</i>	Difference for girls	Short-run <i>Treatment effect</i>	Difference for girls	Long-run <i>Treatment effect</i>	Difference for girls
Children aged 6-20 in school						
<i>Mean / Coefficient</i>	1.42	-0.27***	0.23**	-0.02	0.24**	-0.23
<i>SD / SE</i>	0.04	0.09	0.11	0.19	0.1	0.18
Daily minutes in school for children aged 6-20						
<i>Mean / Coefficient</i>	528.66	-113.10***	61.58*	-22.48	104.60***	-70.06
<i>SD / SE</i>	16.14	33.10	36.84	66.11	40.08	71.33
Number of Observations	908		924		857	

Notes: * denotes significance at 10 percent, ** at 5 percent, and *** at 1 percent level. The unit of observation is the household. Sample is restricted to households with children aged 6-20. Figures in 2015 USD. We examine difference in means and treatment effects by a dummy equal to one if the share of girls aged 6-20 in the household out of all children aged 6-20 is above the median. Standard errors are robust.

Education effects by gender

- ❑ Positive impact on all educational investment measures
- ❑ No impact towards reducing the gender differential in educational investment.

<i>Educational investments by gender</i>	Baseline		Short-run		Long-run	
	<i>Mean</i>	<i>Difference for girls</i>	<i>Treatment effect</i>	<i>Difference for girls</i>	<i>Treatment effect</i>	<i>Difference for girls</i>
Daily minutes studying for children aged 6-20						
<i>Mean / Coefficient</i>	173.30	-32.27***	16.99	2.12	40.33***	-28.59
<i>SD / SE</i>	6.04	12.18	14.33	(26.89)	12.93	22.9
Schooling expenditure (USD) for all						
<i>Mean / Coefficient</i>	10.76	-2.29**	2.19*	2.15	4.18***	-0.94
<i>SD / SE</i>	0.46	0.98	1.21	2.30	1.29	2.37
Number of Observations	908		924		857	

Notes: * denotes significance at 10 percent, ** at 5 percent, and *** at 1 percent level. The unit of observation is the household. Sample is restricted to households with children aged 6-20. Figures in 2015 USD. We examine difference in means and treatment effects by a dummy equal to one if the share of girls aged 6-20 in the household out of all children aged 6-20 is above the median. Standard errors are robust.

Summary – Long-run

	<i>Baseline Difference (%)</i>	<i>Treatment Effect (Average) (%)</i>	<i>Treatment Effect (Difference) (%)</i>
Children aged 6-20 in school	19.0	16.9	No statistically significant effect
Daily minutes in school for children aged 6-20	21.4	19.8	Ditto
Daily minutes studying for children aged 6-20	18.6	23.3	Ditto
Schooling expenditure (USD) for all	21.3	38.8	Ditto

Also:

- mothers and ‘uneducated’ parents have lower educational aspirations for their children and more so for their daughters, particularly beyond secondary education;
- The treatment did not change these aspirations;

Thank You

