The Role of Son Preference and Birth Order in Child Development:
Evidence from Kyrgyzstan

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Overview:

- Paper Motivation

- Methods

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Paper Motivation:

- Around 140 million **'missing' women** around the world (UNFPA, 2020).

- **Son preference** is prevalent in many parts of South Asia, East Asia, and the Caucasus and it leads to **differential pre- and post-natal treatment of girls** and **gender biased sex selection** (Brainerd, 2013; Gupta 1987).

- Son preference is persistent in many **patrilineal societies** and is a result of **cultural, social, economic,** and **religious norms**.

- Son preference persists because:

    - Girls have **lower economic returns** (Wang et.al, 2020).

    - **Family lineage** can be continued only through **male heirs** and a number of **religious rituals** can only be **performed by male children** (Croll, 2000).

    - Women **move in with husband's family** (Dyson and Moore, 1983).

Paper Motivation:

Evidence suggests that:

(i) there **are higher abortion rates** for female fetuses

(ii) girls are **breastfed for shorter periods** compared to boys

(iii) have a **greater mortality risk** at the early ages

(iv) are more prone to **neglect** and lack of sufficient child care

(v) have **lower immunization rates**

(vii) are more likely to **have more siblings** (especially if older siblings are also girls)

(viii) receive **less education and health investments** compared to their brothers

(Horton, 1988, Jayachandran, 2017, Jayachandran and Pande, 2017, Wyon and Gordon, 1971, Gupta, 1987, Pande, 2003, Garg and Morduch, 1998).

Study Context:

- Kyrgyzstan performs poorly on gender equality indicator (United Nations, 2020).

- Upon collapse of the Soviet Union, women are portrayed as caregivers and mothers (Asian Development Bank, 2019).

- The incidence of bride kidnapping, early marriages, and forced marriage increased after independence (Asian Development Bank, 2019).

- 23% of women aged 15-49 were physically abused at least once (Asian Development Bank, 2019).

- Maternal mortality at 76 maternal deaths per 100,000 lives (United Nations, 2020).

- Stunting of children under five years old is 12%, with peak at 17.2% for 18-23 months old children (UNICEF, 2019).

Research Questions:

(1) Does son preference exist in the Republic of Kyrgyzstan?

(2) Is there a `girl penalty' in the physical development of a child?

(3) Does birth order matter for a child's development in Kyrgyzstan?

(4) Is there a youngest son preference in the Kyrgyz Republic?

Data:

- Life in Kyrgyzstan panel data.

- 2011, 2012, 2013, and 2016 waves.

- 1,500 children under five years old.

Estimation Strategy:

$$HAZ_{im} = \alpha_2 * 2nd\ Child_{im} + \alpha_3 * 3rd\ Child_{im} + \beta_1 * Girl_{im} +$$

$$\beta_2 * 2nd\ Girl_{im} + \beta_3 * 3rd\ Girl_{im} + \gamma * X_{im} + \epsilon_{it}$$

- Dependent variable: HAZ is height- for- age z-score.

- Independent variables: Birth order of boys, birth order of girls.

- Control variables: Age, age squared, household size, highest education attained in the household, household income quintile, mother's age at birth, mother empowerement index.

Results:

Child height by gender and birth order, 2011 and 2016
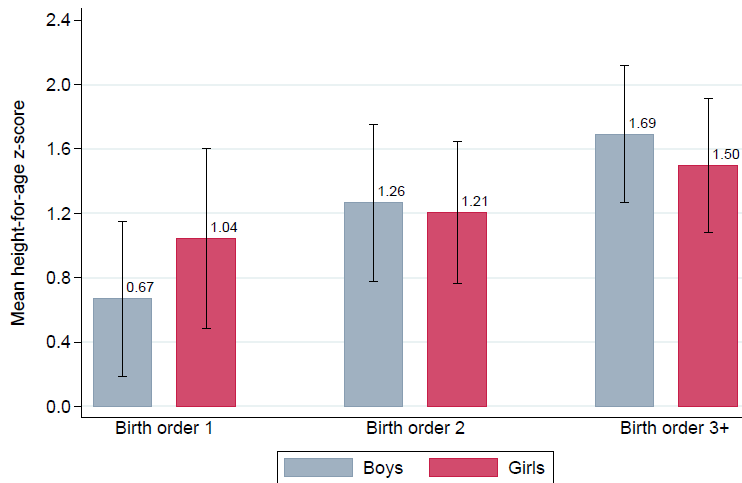
Source: Author's illustrations based on LIK.
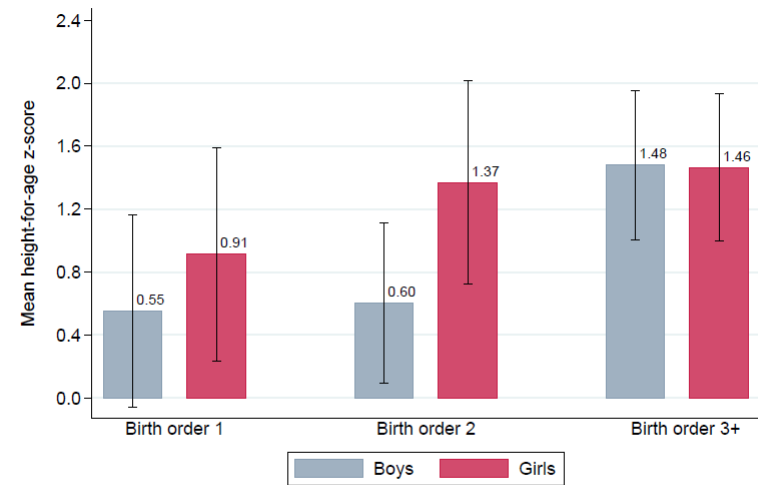
Source: Author's illustrations based on LIK.

Impact of Son Preference and Birth Order on HAZ

	Panel A				Panel B				Panel C			
	2011	2012	2013	2016	2011	2012	2013	2016	2011	2012	2013	2016
Female	0.345*	0.157	0.421**	0.116	0.382**	0.075	0.357	0.199	0.339*	0.047	0.308	0.256
	(0.182)	(0.200)	(0.189)	(0.198)	(0.190)	(0.212)	(0.219)	(0.241)	(0.189)	(0.206)	(0.220)	(0.248)
Second child in HH	0.305	0.111	0.140	0.247	0.347*	0.119	0.057	0.353	0.368*	0.122	0.043	0.359
	(0.199)	(0.173)	(0.172)	(0.198)	(0.207)	(0.173)	(0.194)	(0.230)	(0.208)	(0.177)	(0.200)	(0.231)
Third or later born child in HH	0.290*	0.408**	0.391**	0.055	0.395**	0.313	0.354	0.127	0.394**	0.268	0.332	-0.011
	(0.164)	(0.173)	(0.197)	(0.180)	(0.173)	(0.204)	(0.265)	(0.254)	(0.173)	(0.198)	(0.275)	(0.258)
Girl x Second child in HH	-0.153	0.145	-0.089	-0.146	-0.271	0.080	-0.112	-0.166	-0.293	0.055	-0.052	-0.254
	(0.254)	(0.276)	(0.234)	(0.282)	(0.254)	(0.284)	(0.273)	(0.324)	(0.253)	(0.289)	(0.273)	(0.317)
Girl x Third or later born child in HH	-0.375	-0.228	-0.307	0.020	-0.512**	-0.182	-0.274	-0.020	-0.470*	-0.161	-0.216	-0.019
	(0.234)	(0.226)	(0.218)	(0.272)	(0.250)	(0.247)	(0.265)	(0.326)	(0.253)	(0.238)	(0.268)	(0.329)
Observations	1,362	1,497	1,503	1,000	1,178	1,284	1,018	767	1,178	1,284	1,018	767
R-squared	0.152	0.135	0.269	0.207	0.175	0.145	0.322	0.240	0.198	0.161	0.329	0.274
Household Characteritics	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mother's Characteristics	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes

Notes: The standard errors are clustered at the community level. Household characteristics include household size, income quintile, and the highest education attained. Mother characteristics include mother's age at birth and additionally gender attitude index for the last two waves.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robustness Checks:

Impact of Son Preference on HAZ, 2011
Mothers with Completed Fertility

	(1)	(2)
Female	0.330	0.267
	(0.251)	(0.244)
Second child in HH	0.387*	0.395*
	(0.219)	(0.219)
Third or later born child in HH	0.502***	0.459***
	(0.176)	(0.172)
Girl x Second child in HH	-0.373	-0.400
	(0.298)	(0.289)
Girl x Third or later born child in HH	-0.527*	-0.482
	(0.296)	(0.291)
Observations	802	802
R-squared	0.123	0.150
District FE	No	Yes

Notes: The standard errors are clustered at the community level. Household characteristics include household size, income quintile, and the highest education attained. Mother characteristics include mother's age at birth and additionally gender attitude index for the last two waves.
*** p<0.01, ** p<0.05, * p<0.1

Robustness Checks:

Impact of son preference and birth order on breastfeeding duration

	(1)	(2)
Female	0.478	0.627
	(0.776)	(0.774)
Second child in HH (=1)	1.748**	2.028***
	(0.781)	(0.733)
Third or later born child in HH (=1)	1.695**	1.771**
	(0.724)	(0.693)
Girl x Second child in HH	-1.031	-1.286
	(1.021)	(1.074)
Girl x Third or later born child in HH	-1.323	-1.348
	(0.914)	(0.919)
Observations	798	798
R-squared	0.279	0.344
District FE	No	Yes

Notes: The standard errors are clustered at the community level. Estimations are controlled for household size, income quintile, the highest education attained in the household, and mother's age at birth.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Strengths:

- First evidence generated for Kyrgyzstan using micro data.

- Methodology:

  - Inclusion of wide range of control variables

  - Clustering standard errors at community level

  - Inclusion of district fixed effects

- Using panel data partially controlled for endogeneity issue.

Limitations:

- Data quality:
    - Income data
    - Missing values for bride kidnapping
    - Missing interview dates for 2011 and 2012 waves
- Omitted variable bias:
    - Maternal health
    - Existing child diseases
    - Parental anthropometric measures
    - Desired fertility

Conclusion:

- In general, no strong evidence on the differential treatment of boys and girls.

- Girl penalty emerges for later- born girls.

- Later-born sons have a height advantage and breastfed for longer despite quantity-quality trade off.

Thank You!!!