

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

Manzura Jumaniyazova, Janina Steinert, and Cara Ebert

Manzura Jumaniyazova
School of Social Sciences and Technology
Technical University of Munich
manzura.jumaniyazova@tum.de

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Paper Motivation:

- Three major determinants of son preference:
 - **Institutional:**
 - Land and property lands usually pass on through male heirs (Agarwal, 1994; Carranza, 2012)
 - **Economic:**
 - Girls have **lower economic returns** (Wang et.al, 2020).
 - Higher wage earning potential of men acts as an old age security and insurance for parents (Hesketh and Xing, 2006)
 - **Cultural:**
 - **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:

- there are **higher abortion rates** for female fetuses (Jha, et al, 2011)
- girls are **breastfed for shorter periods** compared to boys (Jayachandran and Kuzimienko, 2011)
- are more prone to **neglect** and lack of sufficient child care (Aswaf, et al., 2010; Barcellos, et al, 2014)
- have **lower immunization rates** (Pande, 2003)
- girls are **shorter** (Jayachandran and Pande, 2017)
- are more likely to **have more siblings** (especially if older siblings are also girls) (Jensen, 2003; Rosenblum, 2013)
- receive **less education and health investments** compared to their brothers (Kugler and Kumar, 2017; Lee, 2008; Palloni, 2017, Wang 2018)
- have a **greater mortality risk** at the early ages (Das Gupta, 1987)

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).
- 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) Does birth order matter for a child's development in Kyrgyzstan?
- (3) Is there a youngest son preference in the Kyrgyz Republic?

Data:

- Life in Kyrgyzstan panel data.
- 2011, 2012, 2013, and 2016 waves.
- 4,628 children under five years old.



Estimation Strategy:

- Dependent variable: HAZ is height- for- age z-score.
- Independent variables: Birth order of boys, birth order of girls.
- Control variables: Age in months, maternal characteristics (age, age squared, education, number of children and number of boys of the mother), household characteristics (households size, residence, asset index, income, and family type)
- Mother-year fixed effect.

$$\text{HAZ}_{im} = \alpha_1 + \alpha_2 * 2^{\text{nd}} \text{Child}_{im} + \alpha_3 * 3^{\text{rd}} \text{Child}_{im} + \beta_1 * \text{Girl}_{im} + \beta_2 * 2^{\text{nd}} \text{Girl}_{im} + \beta_3 * 3^{\text{rd}} \text{Girl}_{im} + \gamma_1 * X_{im} + \gamma_2 * Z_{im} + \epsilon_{it}$$

Results:

Child height by gender and birth order in the polled sample

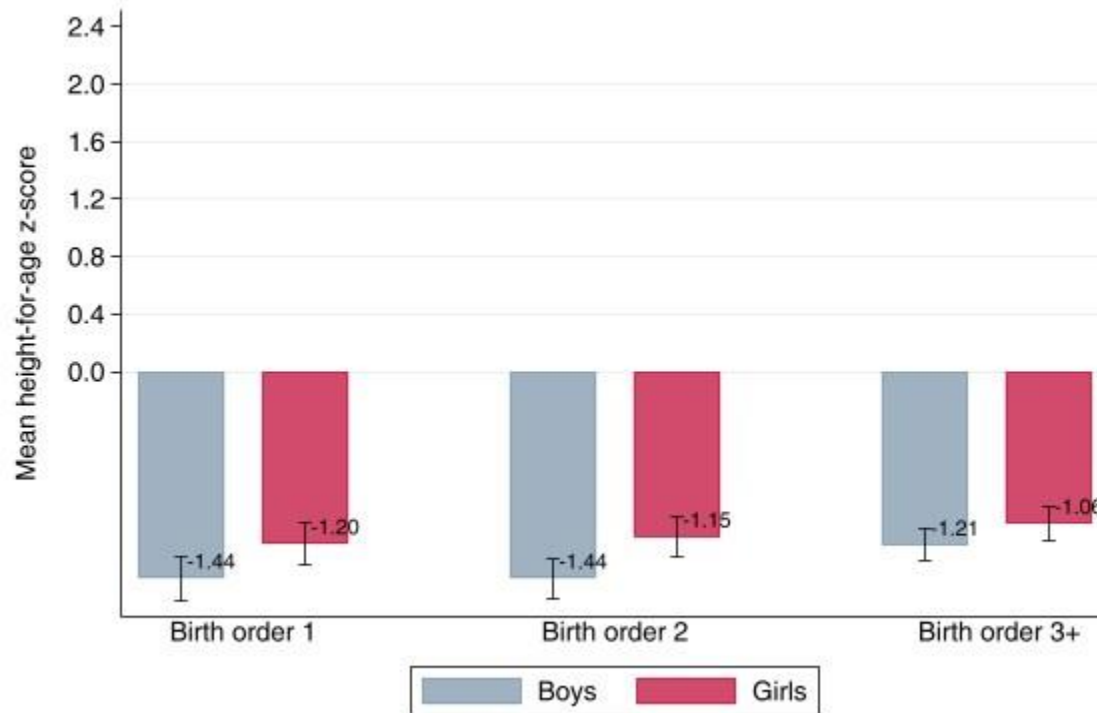


Table 1: Summary Statistics of child, mother, and household characteristics.

<i>Variables</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>N</i>
	(i)	(ii)	(iii)	(iv)	(v)
<i>A. Child characteristics</i>					
<i>Age in months</i>	31.84	16.33	0	59	4628
<i>Girl (=1)</i>	0.48	0.50	0	1	4628
<i>Birth order of a child</i>	2.17	1.20	1	8	4628
<i>Last born child (=1)</i>	0.47	0.50	0	1	4628
<i>Height-for-age (z-score)</i>	-1.28	1.97	-5.99	6	4628
<i>Weight-for-age (z-score)</i>	-0.16	1.24	-5.93	4.92	4628
<i>B. Mother characteristics</i>					
<i>Age</i>	28.98	6.31	16	55	4628
<i>Number of children per mother</i>	2.45	1.22	1	8	4628
<i>Completed fertility (no birth between 2011-2016)</i>	0.37	0.48	0	1	4628
<i>C. Household characteristics</i>					
<i>Household size</i>	7.07	2.51	2	17	4628
<i>Number of women in household</i>	2.13	1.08	1	7	4628
<i>Urban (=1)</i>	0.30	0.46	0	1	4628

Source: Life in Kyrgyzstan Survey 2011-2016. All statistics are based on the pooled sample of all waves and restricted to a sample of children under the age of five.

Table 2: Child gender and birth order gradient in child height

Variables	Height- for-age z- score	Height- for-age z- score	Height- for-age z- score	Height- for-age z- score
	(i)	(ii)	(iii)	(iv)
<i>Female (=1)</i>	0.19** (0.09)	0.08 (0.10)	0.04 (0.13)	-0.44 (0.55)
<i>Second child of a mother (=1)</i>	-0.07 (0.09)	-0.08 (0.11)	-0.06 (0.14)	-0.24 (0.59)
<i>Third or later born child of a mother (=1)</i>	0.17* (0.09)	0.28* (0.16)	0.36* (0.21)	0.52 (1.06)
<i>Girl x Second born child of a mother</i>	0.08 (0.13)	0.10 (0.15)	0.09 (0.19)	0.83 (0.75)
<i>Girl x Third or later born child of a mother</i>	-0.08 (0.13)	-0.23 (0.14)	-0.22 (0.18)	0.40 (0.84)
<i>Constant</i>	-1.01*** (0.07)	0.02 (0.05)	0.03 (0.07)	-0.34 (0.93)
<i>Observations</i>	4,942	3,851	2,323	2,323
<i>Mother controls</i>	No	Yes	Yes	No
<i>Household controls</i>	No	No	Yes	No
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>Year and mother FE</i>	No	No	No	Yes

Source: Life in Kyrgyzstan Survey 2011-2016. All statistics are based on the pooled sample of all waves. Standard errors are clustered at the mother level and appear in parenthesis.

Heterogeneity analysis/ Robustness Check:

- by location (rural/urban)
 - by family structure (extended/nuclear)
 - by income quintile
 - by mother's education (low/high)
- No statistically significant differences observed
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- Replicate the analysis with the Multiple Indicator Cluster Survey Kyrgyzstan 2018 → No statistically significant results

Limitations:

- Measurement of son preference
 - Omitted variable bias:
 - *Maternal health*
 - Existing child diseases
 - Parental anthropometric measures
 - Desired fertility
- Mother-year fixed effect reduces the sample substantially

Conclusion:

- In general, *very weak-no* linear relationship between gender and birth order of a child and his/her height
- No heterogeneous differences by location, income quintile, family structure, and maternal education

Thank You!!!