

Parental Divide in the Time of Covid-19: An Ethical Assessment of Learning Inequality

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5 October 2022

WIDER Conference on “Inequality Reducing inequality – the great challenge of our time” Bogotá, Colombia

Family & Educational Inequality During School Closure

- A well-established association of children's SES & school achievement
 - e.g. Haveman and Wolfe 1995; Cook and Evans 2000; Sirin 2005; Heyneman, 2015
- ...and yet the debate over relative importance of family vs school
 - Coleman 1987; Schneider & Coleman 1993, Agasisti & Longobardi, 2017; Agasisti et al 2021
- The primacy of family & the “new inequality” ... following global school shutdown
 - Blundell et al 2022; Hossain 2022; Cashman et al., 2021
- Our key point
 - Closing the 'family divide', if a pre-requisite for equality of educational opportunities, needs to differentiate between parent's financial resources and non-pecuniary efforts.

Parents & Educational Inequality: Instrumental vs Intrinsic Importance

- **Instrumental reasons:** different forms of parenting involvement for educational development and/or remedial interventions.
 - Behrman et al 1999; Andrabi et al 2012; Banerji Berry, and Shotland, 2017; Mayer, Kalil, Oreopoulos and Gallegos 2019; Angrist et al 2020; Bergman and Chan, 2021; Avvisati et al 2014; Rao et al. 2021; Levy et al 2022).
- **Intrinsic reasons:** different forms of parenting also important from a normative point of view.
 - Liberal egalitarianism (e.g. Roemer): educational policies preventing advantage or disadvantage should include all forms of 'parental divide'.
 - Bary – All differences due to **student effort**
 - Swift – All differences due to '**intimate familial interactions**' (reading bedtime stories, holding conversations over a meal, and role-modelling work ethics)

Intimate Familial Interaction?

*“Intergenerational transmission of advantage that occurs through process directly involving the fact that some parents are economically better off than others is, in principle, least worthy of respect. The bequeathing of money, the purchasing of expensive education, or of access to superior health care, are things that we might be willing to disallow. Contrast this with personality, and other ‘culture’ variables. Suppose that well-off parents tend to produce well-off children because such parents take an unusual personal interest in their children’s development, they read bedtime stories, they talk about things at the table, they instil, by their example, a positive attitude toward work, and so on. Here prevention in the name of equality of opportunity looks much more problematic. The value of close family relationships, quite apart from the sheer impracticability of policing any preventive policy, means that few would choose to equalize that way. To the extent that **the reproduction of inequality across generations occurs through** the transmission of cultural traits, it does so substantially (though not exclusively) through **intimate familial interactions that we have reason to value and protect. Preventing those interactions would violate the autonomy of the family** in a way that stopping parents spending their money on, or bequeathing money to, their children would not.”*

Swift (2005) “Justice, luck, and the family: the intergenerational transmission of economic advantage from a normative perspective” (p. 272)

Policies to Aid Learning: Expanded Menu Choice

- School/teacher e.g. curriculum revision/ TARL interventions, supplementary classes etc
- Family/student e.g. cash transfers & stipend/scholarships

- Fee charging Edtech services
 - *China & India's EdTech rise e.g. Byju's, MindSpark etc* (Teräs et al., 2020; Williamson 2020)
- Parental activism - “Pandemic pods”
 - Jochim and Poon, 2022; James 2021; Watson, 2020

- Tele-tutoring for students at home (Carlana & La Ferrara, 2021)
- Remote-tutoring pilots @ Youth-Impact initiative
 - *El Salvador, Argentina, Mexico, Guatemala, Dominican Republic, Ecuador, Brazil, Uruguay, Paraguay & Peru*
- SMS messages & phone calls targeting parents to support children
 - Angrist et al., 2022 (*Botswana*)

What Do We Do?

- Exploit learning experience at home in the early months of COVID-19 school closure in Bangladesh to offer an ethical assessment of educational inequality.
- Gauge the magnitudes of explained variation in learning time by sources:
 - *Acceptable / fair inequalities*
 - (1) parental investments in out-sourced support (private tutors, coaching, etc.)
 - (2) parental time spent helping children;
 - (3) student study effort
 - *Unacceptable/ unfair inequalities* – as residual (other circumstance differences)
- Consider combinations of ethical proposals
 - Swift (2005) vs Barry (2005) vs Roemer (1998))
- Two outcome variables are:
 - (1) total study time || (2) self-study time at home (unaided by non-family members)
 - Proxies of learning outcomes (Elliot Major et al., 2021; Booth et al., 2021; Cattani et al., 2021)

Main Findings

- *Parental **monetary investments*** account for more than 50% of the predicted variance in **total learning time** among secondary students (both rural areas & urban slums)
 - Parental ***time efforts*** and measures of ***student effort*** explain more than 20% jointly.
- More than 50% of variation in **self-study time** is explained by *parental **time efforts*** and ***student efforts***.
- Depending on the combination of model specification & ethical approach, a wide range of shares of ethically 'defensible' inequality
- For total study time, shares vary as follows:
 - 20-34% in rural primary (or 0) || 15-29% in rural secondary
 - 11-21% in slums primary (or 0) || 8-22% in slums secondary
- For self-study time, shares vary as follows:
 - 47-82% in rural primary (or 0) || 30-62% in rural secondary
 - 26-52% in slums primary (or 0) || 21-59% in slums secondary

Outline

1. Introduction
2. Conceptualizing ethical evaluation of educational inequality of opportunity & “parental divide”
3. Methodological framework, empirical approach and methods
4. Data, key variables and descriptive stats
5. Results
6. Summary / conclusion

Conceptualization (1)

Multiple educational inputs vs “ethically defined” components

Domain name	Educational Inputs	Normative categorisation	Ethically defensible?
Family's SES	Digital tech access (TV internet smart phone computer) Income poverty	Family circumstances: Non-intimate	No
Parental Background	un/less-educated father /mother Digital skills	Family circumstances: Non-intimate	No
Parental effort: time	parental time to children's education child care	Family circumstances: intimate	Swift
Parental effort: money	outside coaching home tutor hh's edu expenses	Family circumstances: Non-intimate	No
Student effort	self-discipline attentive non-disruptive work ethics taste for maths	Non-family: Individual responsibility, talent & preference	Barry & Roemer*
Student demographics	gender caste religion family size siblings	Family circumstances: Non-intimate	No
Student's school background	school type quality distance	Family circumstances: Non-intimate	No

Note: * According to Roemer criteria, student effort orthogonal to family circumstances.

Conceptualization (2)

Inequality consequences of ethical partition

Ethical criteria	Inputs affected	Primary	Secondary
Swift	Intimate family affair/parental activism	Some acceptable inequality *	Some acceptable inequality
Barry	student effort should be respected even if induced by parental pressure	Some acceptable inequality *	Some acceptable inequality
Roemer	Only orthogonal measure of student effort	Some acceptable inequality *	Some acceptable inequality

Note: () 0 if invoking "age of consent" to apply "Principle of compensation" which applies to primary kids in all context (Roemer and Trannoy, 2016)*

Conceptualization (3)

- We consider 3 possibilities relating to *parental efforts* and *student efforts*

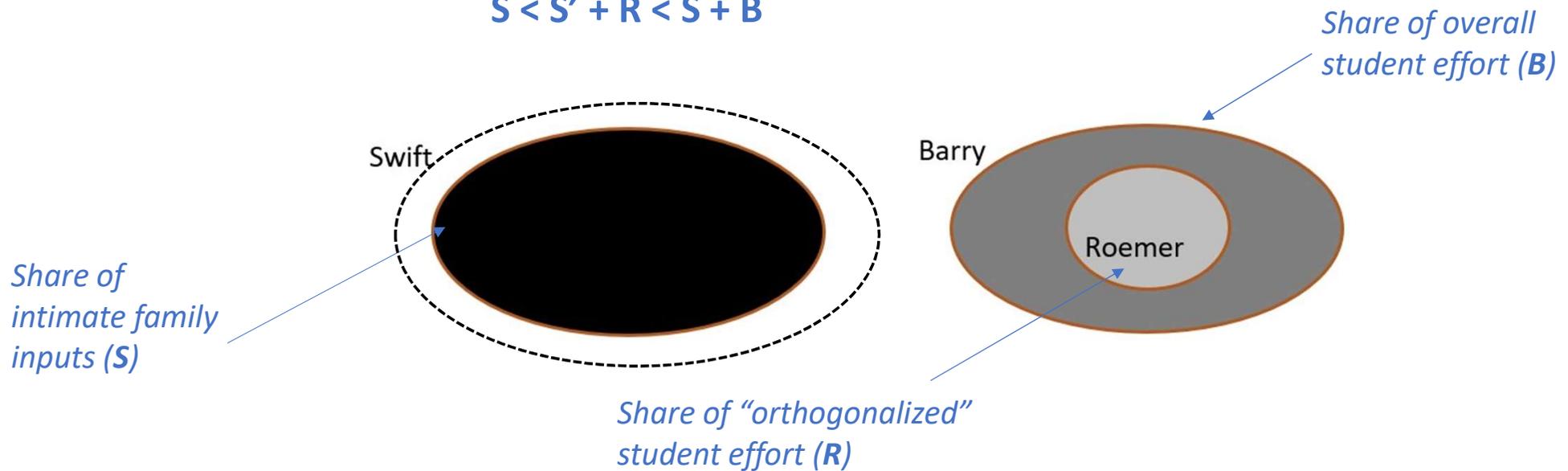
S: Swift only

S + B: Swift combined with a 'broad' version of Barry

S' + R: Swift combined with Roemer

- The size of 'fair' inequalities would be:

$$S < S' + R < S + B$$



Methodological Framework: Modelling Competing Ethical Components

- Alternative shares of predicted variance
 - **Swift** ($\hat{\sigma}_S$) : “intimate family interactions” only
 - **Swift & Barry** ($\hat{\sigma}_S + \hat{\sigma}_B$) : combined measure of “intimate family interactions” & “student effort”
 - **Swift & Romer** ($\hat{\sigma}'_S + \hat{\sigma}_R$) : conditional measure of “intimate family interactions” & “student effort” orthogonal to family

$$\hat{\sigma}_S \leq \hat{\sigma}'_S + \hat{\sigma}_R \leq \hat{\sigma}_S + \hat{\sigma}_B$$

$$\hat{\sigma}_S + \hat{\sigma}_I = 1$$

$$(\hat{\sigma}_S + \hat{\sigma}_B) + \hat{\sigma}'_I = 1$$

$$(\hat{\sigma}'_S + \hat{\sigma}_R) + \hat{\sigma}''_I = 1$$

where σ_I is
“unacceptable inequality”

Methodological Framework: Variance Decomposition

- Variance and square coefficient of variation are the only linearly decomposable inequality measures (Shorrocks 1982).
 - Equivalent to Shapley value decomposition.
- Variance decompositions have been recently used to quantify ethically defined components of inequality
 - health outcomes (Jusot et al., 2013; Davillas and Jones, 2020, 2021)
 - asset indices (Monroy-Gomez-Franco et al., 2021)
 - education test scores (Ferreira and Gignoux, 2014; Asadullah et al., 2021).

Empirical approach: Variance Decompositions

- For an OLS model of education production function:

$$y = \sum_{j=1}^m \beta_j s_j + \epsilon$$

$$\hat{y} = \sum_{j=1}^m \hat{\beta}_j s_j$$

- ...we can decompose the predicted variance into groups of components:

$$\sigma_{\hat{y}} = \sum_{j=1}^m \text{cov}(\hat{\beta}_j s_j, \hat{y})$$

$$\hat{e} = \sum_{j=1}^g \hat{\beta}_j s_j, \quad g < m$$

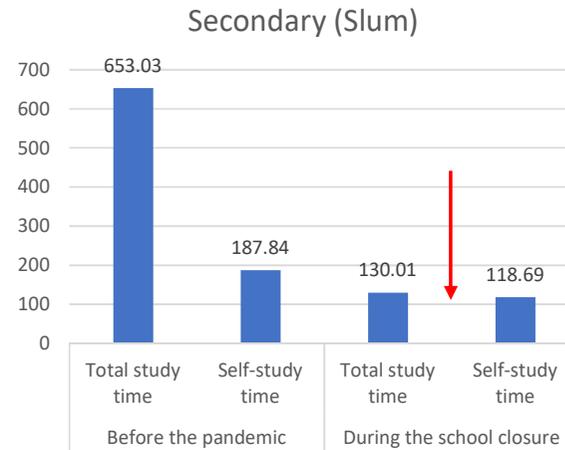
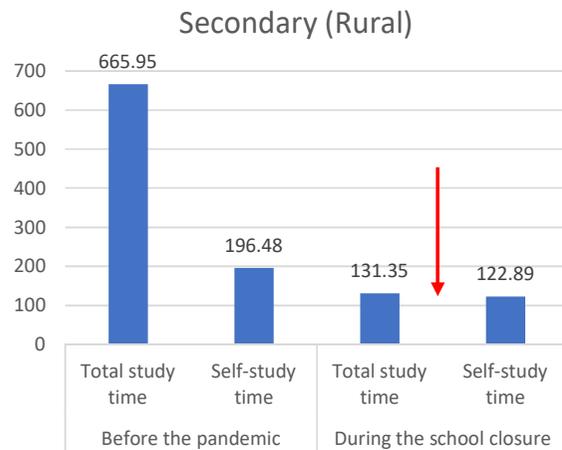
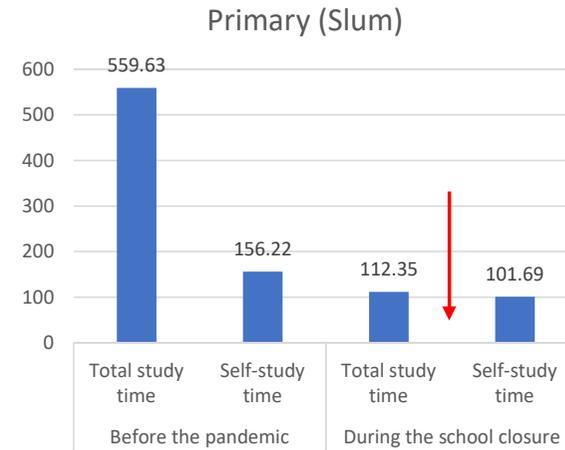
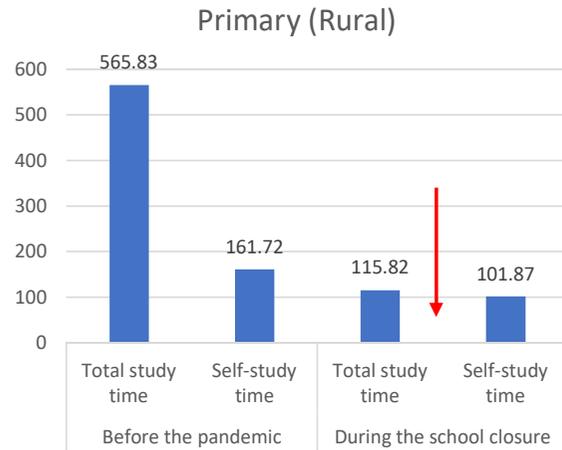
$$\text{cov}(\hat{e}, \hat{y}) = \sum_{j=1}^g \text{cov}(\hat{\beta}_j s_j, \hat{y})$$

Note: Roemer's share is based on an auxiliary equation of student effort not shown here

Data

- Purposefully designed survey in collaboration with BRAC Institute of Governance and Development (BIGD) during [May 2020](#) (early months of school closure in Bangladesh).
- Data collection:
 - Rapid-response [telephone survey](#) using pre-existing sample of rural and (urban) slum households.
- Target respondents
 - children enrolled in grades 4-10 at time of survey and their mothers.
- Sample & representation:
 - Large sample (N=6000)
 - Nationwide coverage – all districts
 - Rural sample covers all divisions, but in slums sample three divisions left out.
 - But sample has pro-poor bias - not nationally representative.
- Key measurements:
 - Time use data for children and adults reported on previous day in minutes across educational and non-educational activities during and (retrospectively) before the lockdown.
- Also data on digital technology, educational status/activities, background socioeconomic features.

Descriptive Statistics: Self-reported Study Time (in mins.)



Full List of Covariates - Educational Inputs

Domain name	Variable	Description	Model
Family's SES 1: Digital technology access	TV Internet Smart phone Computer	Dummy	1,2,3,4,5
Family's SES 2: Income Poverty	Extremely poor Moderately poor	Dummy : below lower/upper PLI	1,2,3,4,5
Parental Background	Father uneducated Father at least second edu mother uneducated Mother at least second edu	Dummy	1,2,3,4,5
	Mother worried	Dummy equal to 1 if mother worried during the pandemic	1,2,4,5
	Mother's emotion index	An equally weighted sum of five binary indicators: "sad" (equal to 1 if sad); "afraid" (equal to 1 if afraid); "tension" (equal to 1 if tense); "worried" (equal to 1 if worried); "restless" (equal to 1 if restless)	3
Parental effort 1: time	Mother's time to children's education Father's time to children's education Mother's time in child care	in minutes (daily average during school closure)	1,2,3,4,5
Parental effort 2: money	Coaching	Dummy equal to 1 if child attended coaching center	1,2,3,4,5
	Tutor	Dummy equal to 1 if private tutor hired for child	1,2,3,4,5
	Expenses	Expenses in child's education (per month)	1,2,3,4,5
Student effort : proxies	Participation in household chores	Time spent in looking after siblings and household chores	1,2,3,4,5
	Participation in child labour	Time spent in paid work (daily average during school closure)	1,2,3,4,5
	Not being tensed	Dummy equal to 1 if free of tension during pandemic	1,3,4,5
	Child emotion index	An equally weighted sum of three binary indicators: "sad" (equal to 1 if sad); "afraid" (equal to 1 if afraid); "tension" (equal to 1 if tense)	2
Student demographics	Gender Religion (Non-Muslim) HH size HH composition		1,2,3,4,5
Student's school type	Public school BRAC Islamic School	Dummy	1,2,3,4,5

Variance Decomposition for Secondary Sample (Rural Households)

Total study time

Domains	Models				
	1	2	3	4	5
Family's SES: Digital access	0.0299 (0.0185)	0.0261 (0.0168)	0.0287 (0.0189)	0.0295 (0.0179)	0.0295 (0.0187)
Family's SES: Poverty	-0.0007 (0.0053)	-0.0006 (0.0052)	-0.0017 (0.0055)	-0.0008 (0.0052)	-0.0007 (0.0055)
Parental Background	0.1046 (0.0322)	0.1256 (0.0345)	0.0794 (0.0313)	0.1060 (0.0333)	0.1042 (0.0327)
Parental effort: money	0.5033 (0.0555)	0.4918 (0.0536)	0.5134 (0.0572)	0.5017 (0.0548)	0.5032 (0.0555)
Parental effort: time	0.1553 (0.0390)	0.1617 (0.0384)	0.1552 (0.0403)	0.1547 (0.0387)	0.1549 (0.0385)
Student effort	0.1275 (0.0336)	0.1201 (0.0338)	0.1380 (0.0370)	0.1293 (0.0344)	0.1274 (0.0342)
Student's school type	0.0063 (0.0098)	0.0041 (0.0107)	0.0048 (0.0097)	0.0062 (0.0095)	0.0084 (0.0107)
Student demographics	0.0733 (0.0295)	0.0706 (0.0288)	0.0818 (0.0309)	0.0730 (0.0290)	0.0727 (0.0289)

Notes: Bootstrapped standard errors in parenthesis (based on 1,000 resampling)

Self-study time

Domains	Models				
	1	2	3	4	5
Family's SES: Digital access	0.0594 (0.0301)	0.0594 (0.0295)	0.0661 (0.0335)	0.0589 (0.0301)	0.0590 (0.0307)
Family's SES: Poverty	0.0014 (0.0089)	0.0016 (0.0090)	0.0011 (0.0103)	0.0014 (0.0083)	0.0014 (0.0087)
Parental Background	0.1680 (0.0483)	0.1511 (0.0463)	0.0823 (0.0395)	0.1690 (0.0493)	0.1674 (0.0476)
Parental effort: money	0.0784 (0.0316)	0.0758 (0.0314)	0.0815 (0.0364)	0.0778 (0.0321)	0.0782 (0.0316)
Parental effort: time	0.3115 (0.0623)	0.3323 (0.0620)	0.3313 (0.0671)	0.3099 (0.0602)	0.3108 (0.0603)
Student effort	0.2613 (0.0531)	0.2596 (0.0577)	0.2965 (0.0644)	0.2632 (0.0552)	0.2610 (0.0563)
Student's school type	0.0022 (0.0092)	0.0001 (0.0116)	0.0010 (0.0104)	0.0021 (0.0092)	0.0051 (0.0124)
Student demographics	0.1174 (0.0437)	0.1198 (0.0446)	0.1398 (0.0487)	0.1172 (0.0425)	0.1166 (0.0432)

Notes: Bootstrapped standard errors in parenthesis (based on 1,000 resampling)

Variance Decomposition for Secondary Sample (Slum Households)

Total study time

Domains	Models				
	1	2	3	4	5
Family's SES: Digital access	0.0458 (0.0389)	0.0393 (0.0367)	0.0392 (0.0395)	0.0450 (0.0384)	0.0432 (0.0373)
Family's SES: Poverty	0.0179 (0.0246)	0.0187 (0.0251)	0.0164 (0.0251)	0.0171 (0.0250)	0.0173 (0.0243)
Parental Background	0.0611 (0.0451)	0.1138 (0.0511)	0.0574 (0.0402)	0.0614 (0.0431)	0.0609 (0.0445)
Parental effort: money	0.6093 (0.0891)	0.5838 (0.0875)	0.6113 (0.0902)	0.6083 (0.0875)	0.6048 (0.0859)
Parental effort: time	0.0804 (0.0453)	0.0672 (0.0436)	0.0838 (0.0423)	0.0827 (0.0462)	0.0806 (0.0456)
Student effort	0.1353 (0.0570)	0.1244 (0.0549)	0.1362 (0.0623)	0.1339 (0.0590)	0.1336 (0.0550)
Student's school type	0.0018 (0.0117)	0.0003 (0.0097)	0.0015 (0.0135)	0.0020 (0.0113)	0.0121 (0.0199)
Student demographics	0.0481 (0.0364)	0.0521 (0.0382)	0.0537 (0.0358)	0.0492 (0.0389)	0.0470 (0.0386)

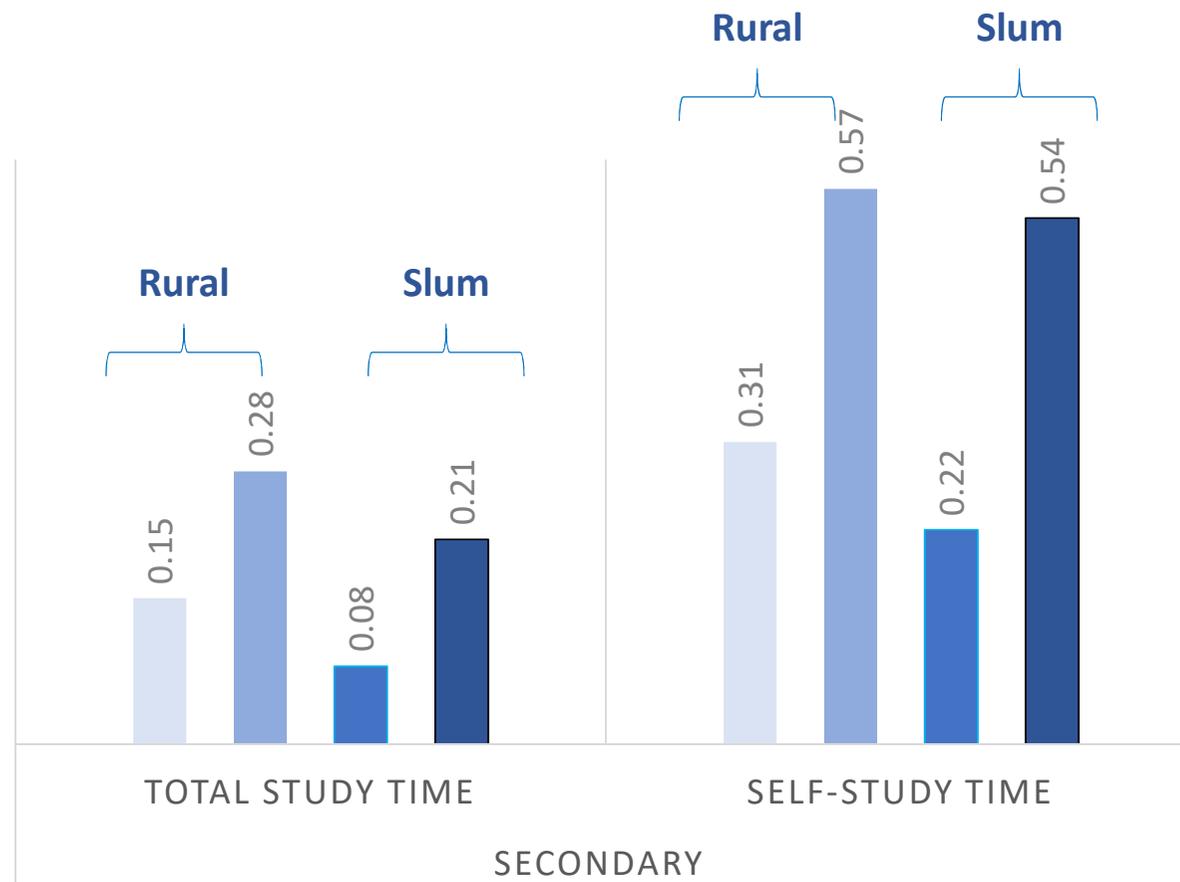
Notes: Bootstrapped standard errors in parenthesis (based on 1,000 resampling)

Self-study time

Domains	Models				
	1	2	3	4	5
Family's SES: Digital access	0.0783 (0.0585)	0.0783 (0.0598)	0.0838 (0.0683)	0.0766 (0.0563)	0.0755 (0.0598)
Family's SES: Poverty	0.0524 (0.0451)	0.0561 (0.0473)	0.0544 (0.0488)	0.0506 (0.0441)	0.0513 (0.0434)
Parental Background	0.1280 (0.0725)	0.1623 (0.0769)	0.0516 (0.0572)	0.1279 (0.0723)	0.1275 (0.0745)
Parental effort: money	0.0623 (0.0587)	0.0554 (0.0588)	0.0660 (0.0607)	0.0608 (0.0542)	0.0611 (0.0563)
Parental effort: time	0.2237 (0.0842)	0.2117 (0.0856)	0.2494 (0.0852)	0.2315 (0.0867)	0.2237 (0.0799)
Student effort	0.3255 (0.0909)	0.2968 (0.0913)	0.3444 (0.1009)	0.3209 (0.0948)	0.3227 (0.0892)
Student's school type	0.0002 (0.0169)	-0.0005 (0.0160)	0.0001 (0.0197)	0.0004 (0.0156)	0.0106 (0.0286)
Student demographics	0.1292 (0.0682)	0.1396 (0.0698)	0.1500 (0.0728)	0.1308 (0.0684)	0.1272 (0.0692)

Notes: Bootstrapped standard errors in parenthesis (based on 1,000 resampling)

Summary: Shares of ethically “defensible” educational inequality (lower & upper bounds)



Conclusion

- The choice of alternative frameworks for inequality assessment matters.
- Respecting variation owing to
 - parental activities as “intimate familial interactions” (*à la* Swift)
 - student effort (*à la* Barry (2005))
 - other principles (*à la* Roemer (1998))
- Even if student effort is ignored, sizable share of ethically “defensible” educational inequality in low income communities
- Among sources of illegitimate inequality during school closure, “digital access” has a low share & parental educational background a higher share
 - consistent with Asadullah and Bhattacharjee (2022)
- Next step -- quantifying the “intermediate case” (Swift + Roemer)

Key References

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