

Improving mathematics learning for the poor: are the best South African schools good enough?

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HSRC RESEARCH OUTPUTS
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- Background and Motivation
- The Grade 9 systemic survey
- Analysis
- Major Findings
- Concluding remarks

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Background and Motivation

- Background
 - Education for all—
 - In 2000 a number of countries including South Africa committed to achieve education for all by 2015
 - Most countries have high enrollment rate but the provision of quality education that ensure successful learning for all is a major challenge
 - The post apartheid South African school improvement strategies
 - removal of financial barriers such as school fees that prevented poor children from accessing quality schools
 - School Poverty Quintiles—where schools are classified based on the poverty level of the community where schools are located (Quintile_1 schools located in the poorest communities and Quintile_5 schools in the least poor communities)
 - School financing by government based on school poverty quintile—learners in the poorest communities receive more funding than those in the least poor schools
 - Learners from poor homes who attend the least poor schools are exempted from paying school fees
 - The underlying assumption of these policies is that access to resources and quality schools would provide learning opportunities that should compensate for home poverty disadvantage.
- Motivation—argue that an understanding of how quality schools provide learning opportunities for the poor and overcome inequalities in learning outcomes related to background characteristics is fundamental to understanding policies and strategies that can ensure quality education for all

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The Grade 9 systemic survey

- Large scale systemic evaluation of Grade 9 learners by HSRC and South African Department of Education carried out in 2009
 - About 9,000 learners from 300 schools randomly sampled from 8000 schools participated in survey
 - Learners responded to a number of test items and provided information about their homes and schools
 - educators and principals also responded to questionnaires that provided information on the context of teaching and learning and the school background characteristics including the poverty quintile of schools
- Objectives:
 - Determine learners' achievement levels
 - Identify contextual factors that explain differences in learners' achievement levels
- Presentation will address the following research questions:
 - What is the extent of the impact of poverty on mathematics achievement?
 - Are the best schools in South Africa good enough for the poor?



Analysis

- Simple descriptive analysis
- Item Response Theory (IRT)
 - Estimate learner achievement levels
 - Develop a scale for learner home poverty characteristics
 - Map learner scale scores to items used in developing the scale
- Scatter plots
 - Visual display of results



Home Poverty Quintile Index

Created from 14 variables describing learners access to the following at home:

Telephone
Cell phone
Running tap water
Electricity
Fridge
Television
Radio
DVD Player
CD player
Motor vehicle
Learner's own bicycle
Learner's own bedroom
Toilet at home
DSTV



IRT scale for Home Poverty Quintile

Home Poverty (Basket of items)	IRT scale	Percentile	Home Poverty Quintile
Own bicycle	1.81		5
Telephone	1.52		
DSTV	1.33		
Motor vehicle	0.74	80th	
	0.44		
	0.16	60th	3
Own bedroom	-0.23		
	-0.30	40th	2
CD player	-0.42		
DVD player	-0.52		
Running tap water	-0.66		
Fridge	-0.78	20th	1
Television	-0.97		
Social electricity makes a difference	-0.98		

Access to schools by Home Poverty Quintile

		School Poverty Quintile									
		1-- poorest schools	2	3	4	5--least poor schools					
Home Poverty Quintile	Count	percent									
		1-- poorest homes	610	592	361	109	41	35.6%	34.6%	21.1%	6.4%
2	Count	419	503	373	195	83	26.6%	32.0%	23.7%	12.4%	5.3%
	percent	21.7%	27.7%	27.2%	17.8%	5.5%	582	741	729	476	148
3	Count	582	741	729	476	148	21.7%	27.7%	27.2%	17.8%	5.5%
	percent	237	353	367	272	120	17.6%	26.2%	27.2%	20.2%	8.9%
4	Count	237	353	367	272	120	17.6%	26.2%	27.2%	20.2%	8.9%
	percent	280	340	514	541	594	12.3%	15.0%	22.7%	23.8%	26.2%
5--least poor homes		280	340	514	541	594	12.3%	15.0%	22.7%	23.8%	26.2%

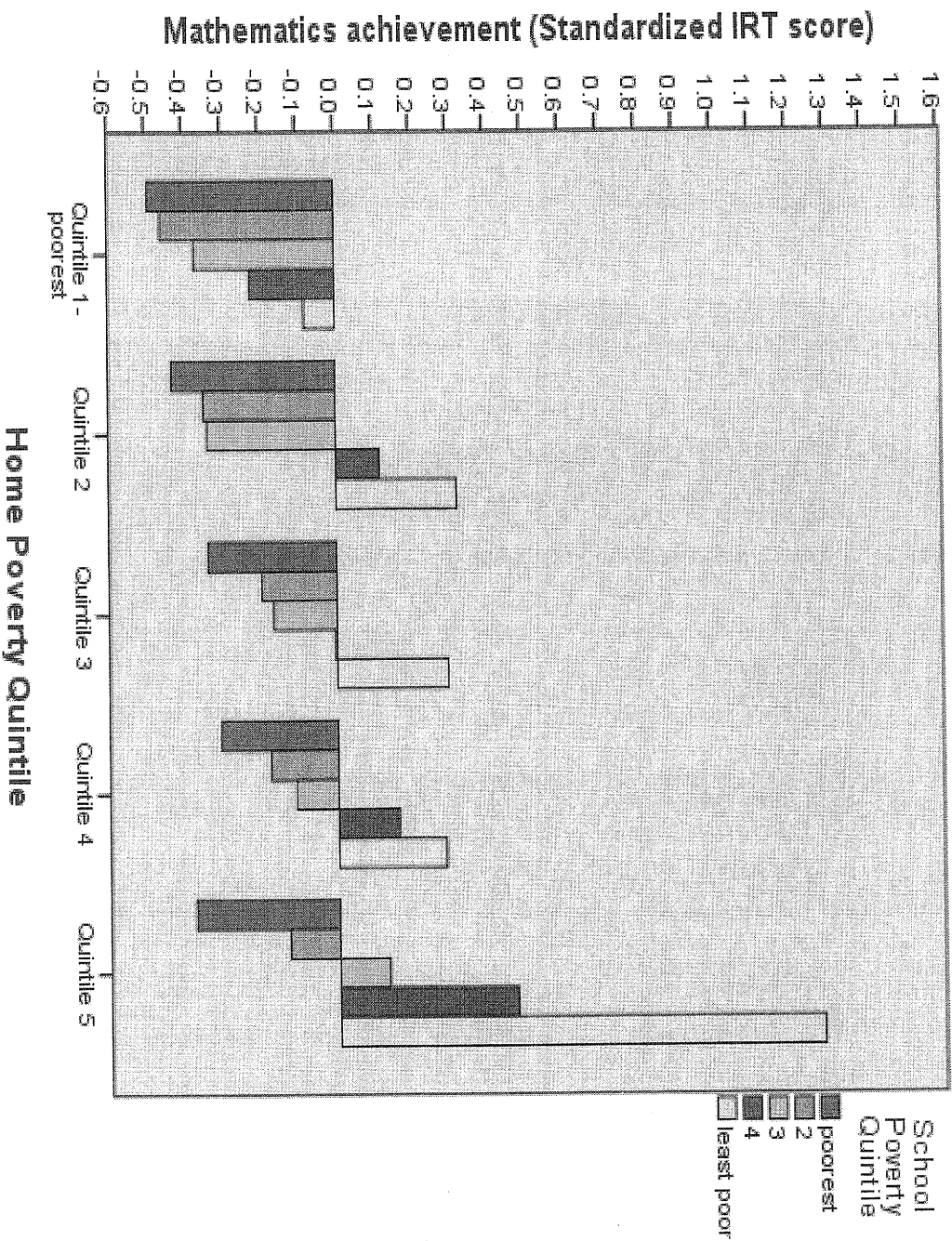
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Access to Quintile 5 schools

Background Characteristics	Percentage of learners in Quintile 5 schools	
Home Poverty Quintile	1=poorest	2.4
	2	5.3
	3	5.5
	4	8.9
	5=least poor	26.2



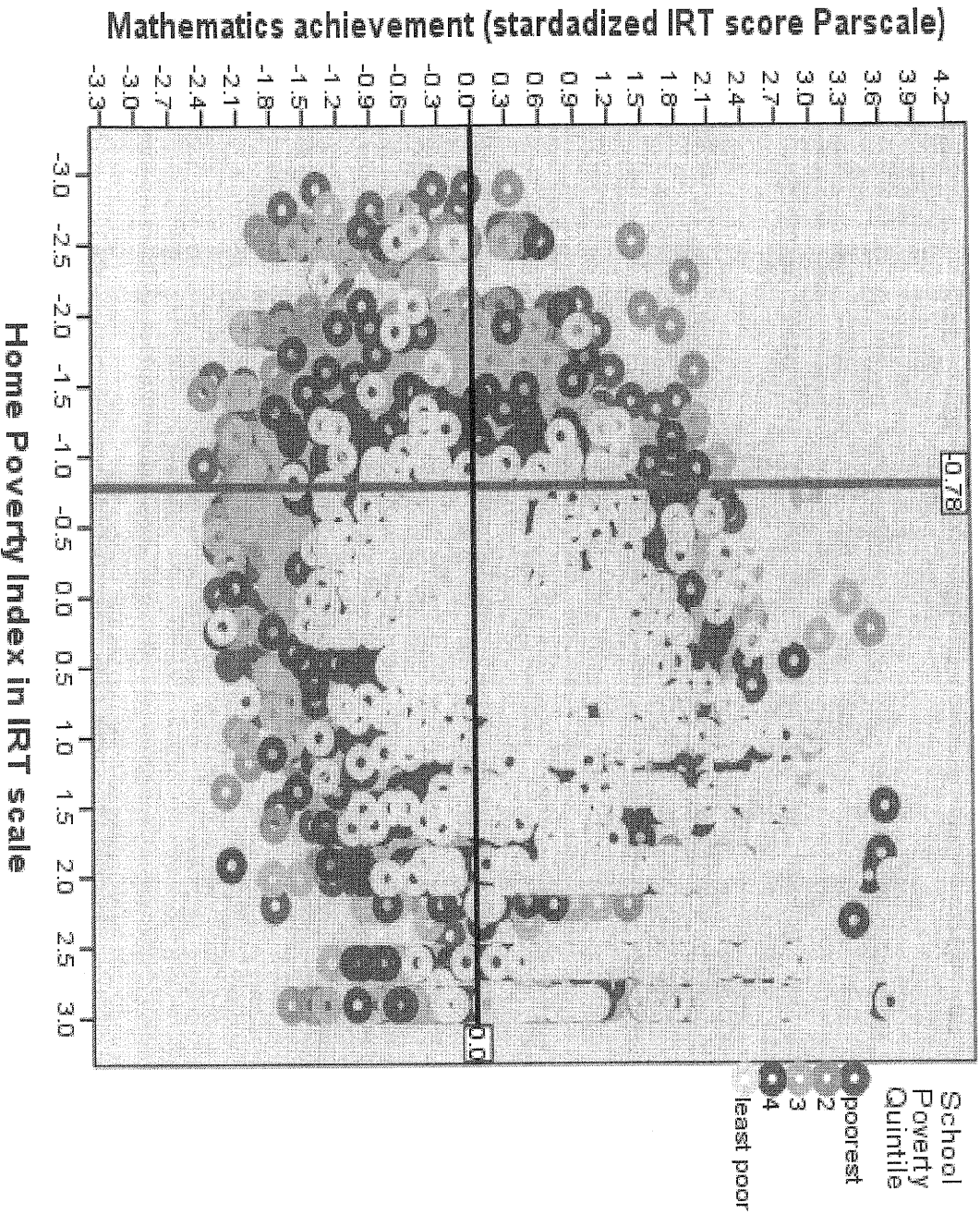
Impact of poverty on mathematics achievement



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Scatter plot of learner achievement levels by home poverty and school poverty quintile



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Summary of Major Findings

- The South African schools are highly segregated by social class—learners from the poorest homes tend to enroll in the poorest schools while those from the least poor homes tend to attend the least poor schools.
- Within schools of similar poverty levels, learners from the least poor homes tend to be more successful learning mathematics than those from the poorest homes.
- The impact of poverty on mathematics achievement is particularly prominent in the least poor schools (Quintile_5 schools).
- The achievement level of a learner from the poorest home who have access to the best schools is below the national average suggesting that the best schools are not good enough for our learners who come from the poor homes.
- There are a few poor learners in poor schools who are successful learning Mathematics.



Concluding remarks

- Current targeted interventions excluding Quintile 5 schools are missing the poor learners in these schools who need help
- Improved resources to schools without an understanding of how these resources work to improve learning would not be enough
- Need to develop an understanding of the conditions in schools and at home that provide opportunities for some learners from the poorest homes attending the poorest schools to succeed
- Develop an understanding of indicators of exemplary schools—where learners are successful irrespective of their background characteristics
- ???.

The End

Thanks

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