

Micro-Class Inequalities In Early Reading and Mathematics Skills

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Roxanne Connelly
(R.Connelly@warwick.ac.uk)

Vernon Gayle
(Vernon.Gayle@ed.ac.uk)

Outline

- ▶ Background: Educational Inequalities in Early Reading and Mathematics Attainment in the UK.
- ▶ The Micro-Class Approach:
 - Development of our UK micro-class scheme for SOC2000.
- ▶ Exploratory Analysis of Micro-Class and Test Scores.

Introduction

- ▶ A stable phenomenon observed in the field of education is the influence of a child's socio-economic background on their educational attainment.

Educational Inequalities

- ▶ Social Class is a powerful predictor of educational test scores at age 7, as well as progress in test scores between age 5 and 7 (Sullivan et al. 2010).

Early Reading and Mathematics

- ▶ Home literacy environments stimulate the development of a child's cognitive and language skills (e.g. Farkas and Beron 2004).
- ▶ There are substantial differences in home literacy environments of children from different social classes, which may contribute to differences in reading capabilities between children (Brooks-Gunn, Klebanov & Duncan 1996, Duncan, Brooks-Gunn & Klebanov 1994).

Early Reading and Mathematics

- ▶ More advantaged parents tend to interact more verbally with their child; they use more abstract words, more complex syntax, and invite their child more often into conversation (Bernstein 1971).
- ▶ Book reading, sharing and dialogical reading practices are more common (Jordan, Snow and Porsche 2000).
- ▶ The language practices of advantaged families mirror the language of books and formal schooling and foster good literacy skills (Tabors, Snow and Dickinson 2001).

Early Reading and Mathematics

- ▶ Whilst there is a large volume of literature on the links between social class and the development of literacy skills, there is a real dearth of literature on the links between social class and mathematics attainment.

Micro-Class

- ▶ The analysis of contemporary occupational structures based on micro-classes is a novel approach to social stratification research (see Grusky et al. 2008, Grusky and Sorensen 2001, Jonsson et al. 2009) .

Micro-Class

- ▶ Grusky (2005, 66) defines a micro-class category as ‘a grouping of technically similar jobs that is institutionalized in the labor market through such means as (a) an association or union, (b) licensing or certification requirements, or (c) widely diffused understandings... regarding efficient or otherwise preferred ways of organizing production and dividing labor’.
- ▶ In congruence with the ‘big’ class approach the labour market is considered to be balkanised into discrete categories, however the categories are balkanised at the level of specific occupations (e.g. doctors, teachers or electricians) rather than large agglomerate groupings (e.g. semi-routine occupations) (Jonsson et al. 2009, 982-983).

Micro-Class

- ▶ A theoretical dimension of the micro-class approach is the focus on mechanisms of intergenerational reproduction:
 - Occupation-specific human capital (e.g. specific skills).
 - Occupation-specific cultural capital (e.g. cultures, tastes and aspirations).
 - Occupation-specific social networks and economic resources (e.g. fixed resources such as farms and businesses).

Micro-Class for SOC2000

- ▶ In the UK context micro-classes would sit between the eight 'big-class' categories of the National Statistics Socio-Economic Classification (NS-SEC) and the several hundred purely administrative, and sociologically unorganised, occupational unit groups which are used to classify jobs.

Micro-Class for SOC2000

- ▶ In this project we allocated UK Standard Occupational Classification (SOC2000) codes to micro-class categories .
- ▶ Our starting point was the 82 micro-class categories defined by Jonsson et al. (2009), and we also made reference to the ISCO-08 to micro-class coding developed by Griffiths and Lambert.
- ▶ The UK SOC2000 codes were coded to micro-classes individually, drawing on information about occupations.
- ▶ There are 83 micro-classes in our scheme (which may still be refined).

Micro-Class for SOC2000

NSSEC		Number of SOC2000 Codes
1.1	Higher Managerial	19
1.2	Higher Professional	40
2	Lower managerial and Professional	82
3	Intermediate	45
4	Small Employers and Own Account	26
5	Lower Supervisory and Technical	31
6	Semi-Routine	60
7	Routine	50
Total		353

Micro-Class for SOC2000

Micro-Class	SOC2000	NS-SEC
Health Professionals	2211 Medical practitioners	1.2 Higher Professional
	2212 Psychologists	1.2 Higher Professional
	2213 Pharmacists/pharmacologists	1.2 Higher Professional
	2215 Dental practitioners	1.2 Higher Professional
Professors and Instructors	2311 Higher education teaching professionals	1.2 Higher Professional
	2312 Further education teaching professionals	2 Lower Managerial and Professional
	3563 Vocational and industrial trainers and instructors	2 Lower Managerial and Professional

Micro-Class for SOC2000

Micro-Class	SOC2000	NS-SEC
School Teachers	2313 Education officers, school inspectors	1.2 Higher Professional
	2314 Secondary education teaching professionals	2 Lower Managerial and Professional
	2315 Primary and nursery education teaching professionals	2 Lower Managerial and Professional
	2316 Special needs education teaching professionals	2 Lower Managerial and Professional
	2319 Teaching professionals n.e.c.	4 Small Employers and Own Account Workers
	3564 Careers advisers and vocational guidance specialists	2 Lower Managerial and Professional
	6124 Educational assistants	6 Semi-Routine Occupations

Micro-Class for SOC2000

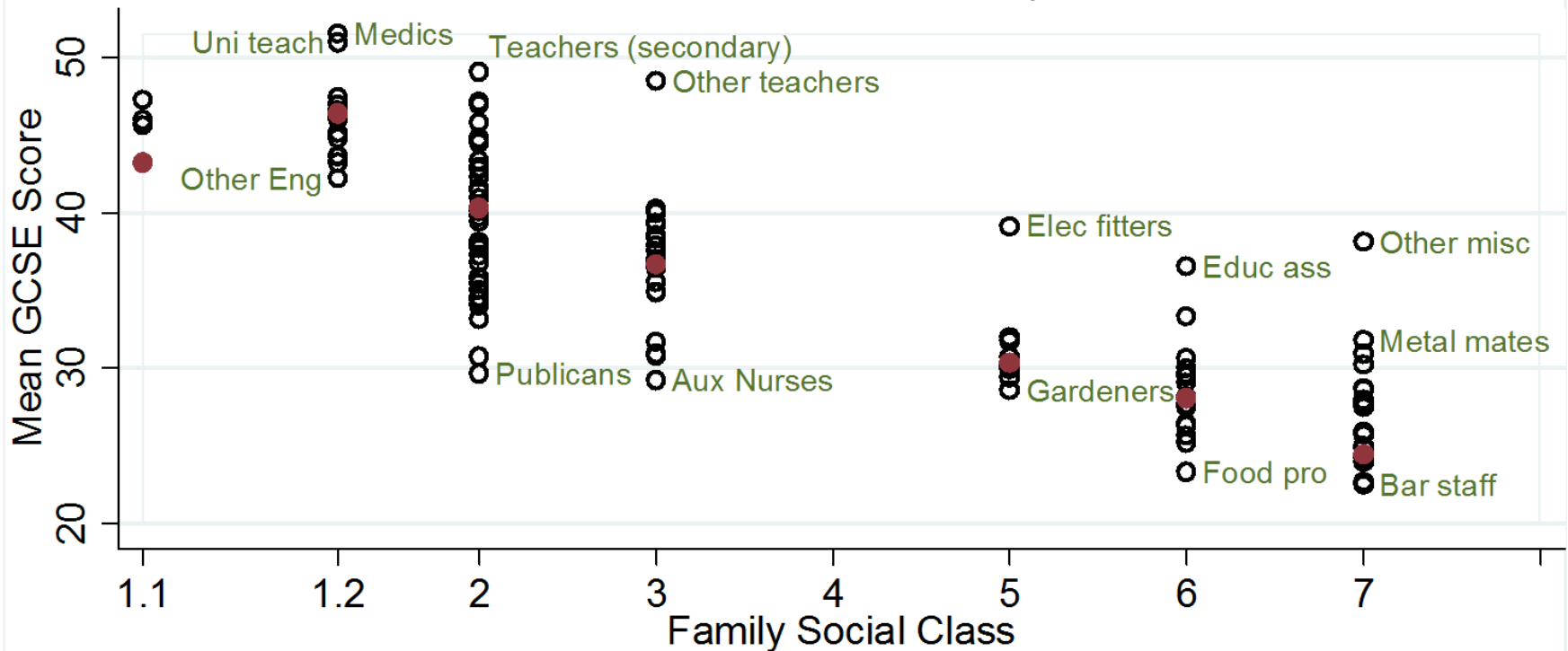
Micro-Class	SOC2000	NS-SEC
Vehicle Mechanics	1232 Garage managers and proprietors	4 Small Employers and Own Account Workers
	5231 Motor mechanics, auto engineers	5 Lower Supervisory and Technical
	5232 Vehicle body builders and repairers	5 Lower Supervisory and Technical
	5233 Auto electricians	5 Lower Supervisory and Technical
	5234 Vehicle spray painters	6 Semi-Routine Occupations
	8135 Tyre, exhaust and windscreen fitters	6 Semi-Routine Occupations

Previous Research

- ▶ There is very limited research to date which looks at social class inequalities in educational attainment beyond the 'big class' level.

GCSE Attainment Year 11

Mean GCSE Score, Parents' SOC90 (large SOC groups)
Illustrations of extreme occupations



● Mean for NS-SEC Class

Source: 1990s YCS Cohorts; Comprehensive school pupils.
121 larger SOC's; Pupils per SOC Mean 380; Min 101; Max 1836 (Nurses).

Research Questions

- ▶ Exploratory analysis of the variation in reading and mathematics scores between micro-classes.
 - Are there additional insights to be gained from examining attainment beyond the big class level?
 - Are there differential patterns of attainment in reading and maths?

Data

- ▶ UK Millennium Cohort Study
- ▶ A sample of children born in the UK between 2000 and 2002.
- ▶ Complex Sample: children living in disadvantaged areas, children of ethnic minority backgrounds, and children living in Scotland, Wales and Northern Ireland were oversampled.
- ▶ Sample size at first sweep: 18,827.
- ▶ Analytical sample size (Sweep 4): 11,485.

Data

- ▶ **Reading Test:** British Ability Scales Word Reading Subtest.
 - The child is asked to read a series of words presented on a card.
- ▶ **Mathematics Test:** National Foundation for Education Research Standard Progress in Maths (PiM) test.
 - The child is asked to complete a series of calculations in a paper and pencil exercise. The test is read aloud to the child and covers topics such as numbers, shapes, measurement and data handling.
 - The MCS uses a shortened version of the PiM test.

Results

- ▶ Standard 'Big Class' Inequalities

	Reading Model 1			Reading Model 2			Maths Model 1			Maths Model 2		
NSSEC												
1.1	-0.03		(0.04)	0.01		(0.04)	-0.07		(0.05)	-0.06		(0.05)
1.2	Ref.			Ref.			Ref.			Ref.		
2	-0.11	**	(0.04)	-0.03		(0.04)	-0.17	***	(0.04)	-0.11	**	(0.04)
3	-0.39	***	(0.05)	-0.24	***	(0.05)	-0.41	***	(0.06)	-0.30	***	(0.06)
4	-0.52	***	(0.05)	-0.34	***	(0.05)	-0.49	***	(0.05)	-0.29	***	(0.05)
5	-0.50	***	(0.06)	-0.31	***	(0.06)	-0.47	***	(0.05)	-0.33	***	(0.05)
6	-0.65	***	(0.04)	-0.40	***	(0.04)	-0.65	***	(0.05)	-0.41	***	(0.05)
7	-0.74	***	(0.05)	-0.46	***	(0.05)	-0.65	***	(0.05)	-0.39	***	(0.05)
Parent's Education												
None				Ref.						Ref.		
NVQ 1				0.07		(0.07)				0.03		(0.08)
NVQ 2				0.28	***	(0.06)				0.21	***	(0.05)
NVQ 3				0.39	***	(0.06)				0.29	***	(0.05)
NVQ 4				0.55	***	(0.06)				0.44	***	(0.06)
NVQ 5				0.68	***	(0.06)				0.56	***	(0.06)
Foreign				0.34	*	(0.17)				0.19		(0.13)
Child Male				-0.17	***	(0.02)				0.05	*	(0.02)
Child's Ethnicity												
White				Ref.						Ref.		
Mixed				0.07		(0.07)				-0.03		(0.07)
Indian				0.32	***	(0.08)				-0.02		(0.11)
Pakistani				0.17	**	(0.06)				-0.38	***	(0.07)
Bangladeshi				0.39	***	(0.10)				-0.34	***	(0.07)
Black Caribbean				-0.14		(0.12)				-0.17		(0.09)
Black African				0.11		(0.06)				-0.35	***	(0.09)
Other (Inc. Chinese)				0.13		(0.10)				-0.06		(0.11)
Constant	0.39	***	(0.04)	-0.12		(0.07)	0.38	***	(0.04)	-0.09		(0.07)
Estimated Adjusted R ²	0.07			0.11			0.05			0.08		
n	11485			11485			11485			11485		

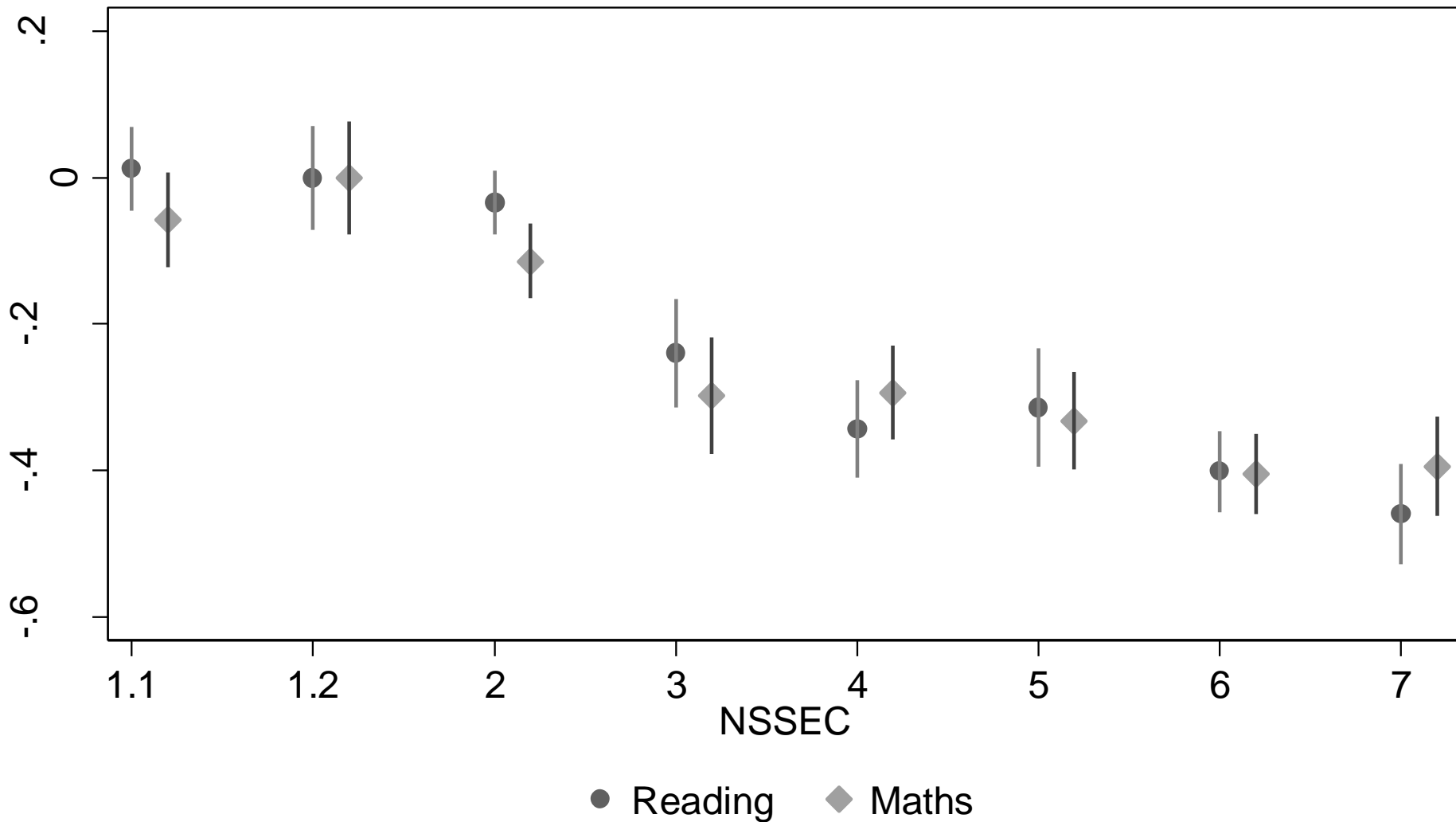
Standard errors in parentheses

	Reading Model 1		Reading Model 2		Maths Model 1		Maths Model 2	
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Bangladeshi			0.39	*** (0.10)			-0.34	*** (0.07)
Black Caribbean			-0.14	(0.12)			-0.17	(0.09)
Black African			0.11	(0.06)			-0.35	*** (0.09)
Other (Inc. Chinese)			0.13	(0.10)			-0.06	(0.11)
Constant	0.39	*** (0.04)	-0.12	(0.07)	0.38	*** (0.04)	-0.09	(0.07)
Estimated Adjusted R ²	0.07		0.11		0.05		0.08	
n	11485		11485		11485		11485	

Standard errors in parentheses

Test Scores (Age 7)

Coefficient and 95% Quasi-Confidence Interval



Data: Millennium Cohort Study (SN6411). n = 14,485.

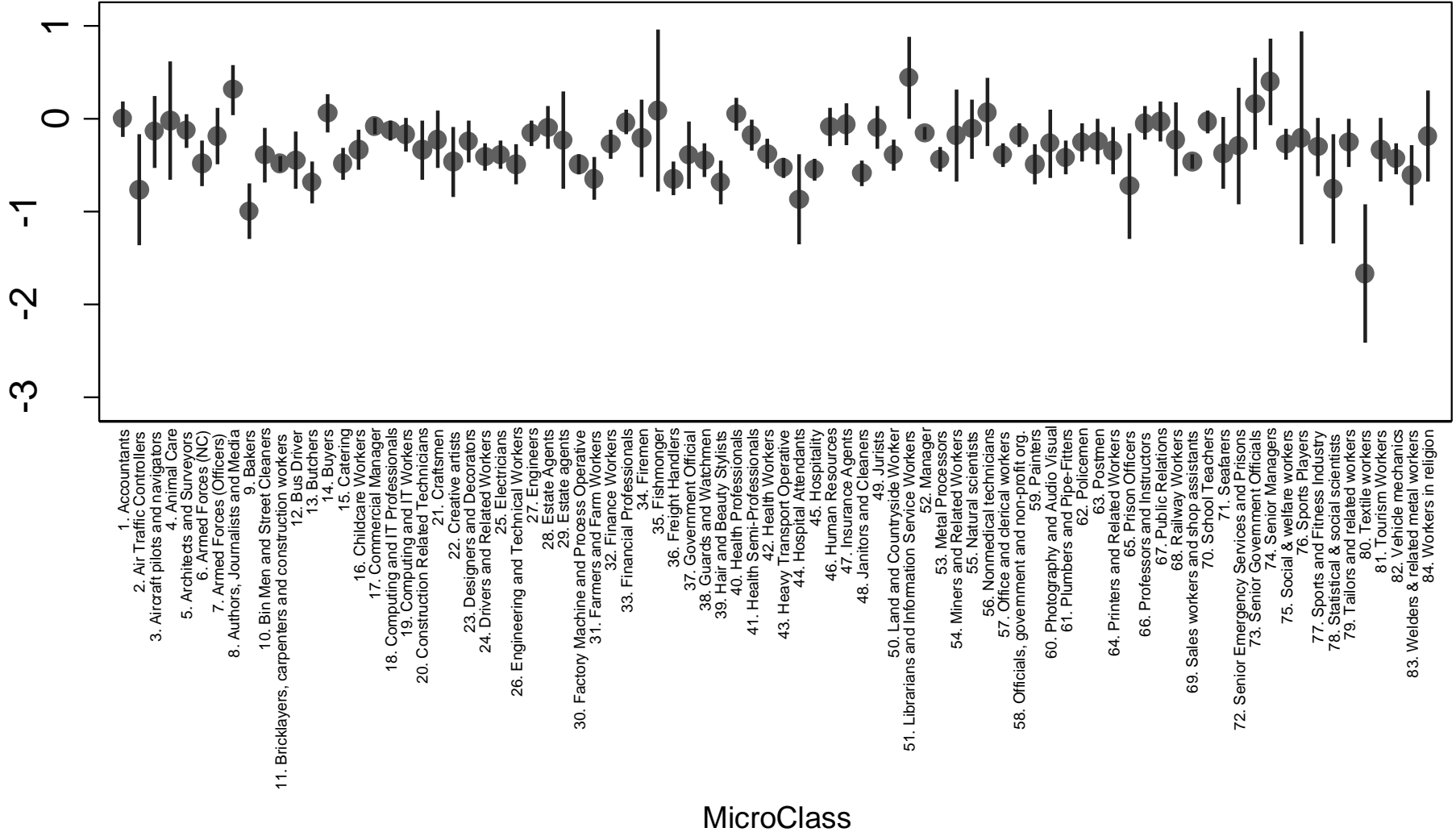
Note: Model also contains gender, ethnicity and parental education.

Results

- ▶ Micro-Class Inequalities

Reading Test Scores (Age 7) by Micro Class

Coefficient and 95% Quasi-Confidence Interval



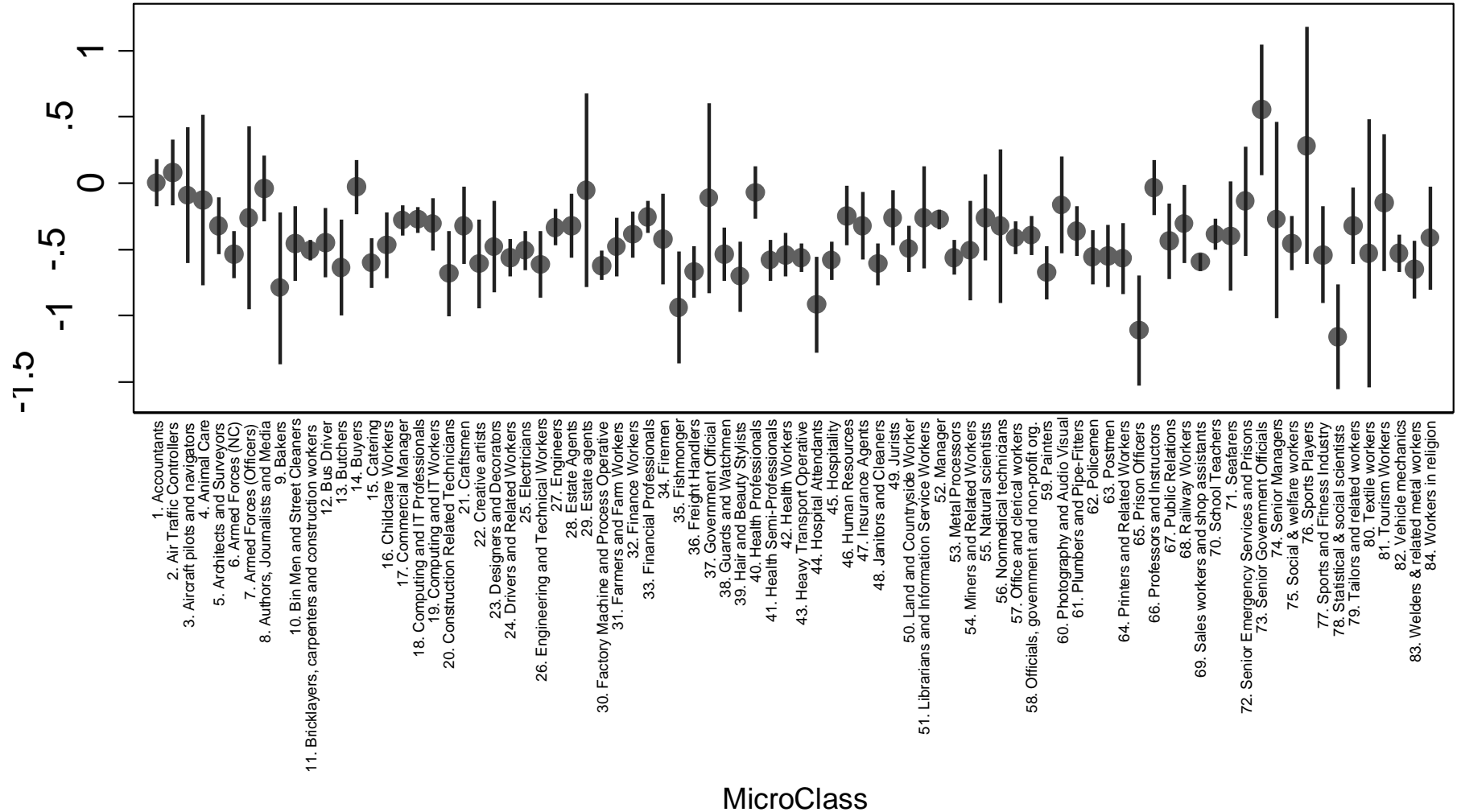
Data: Millennium Cohort Study (SN6411). n = 14,485.

Note: Model also contains gender, ethnicity and parental education.

!!Warning: Includes Small Categories

Maths Test Scores (Age 7) by Micro Class

Coefficient and 95% Quasi-Confidence Interval



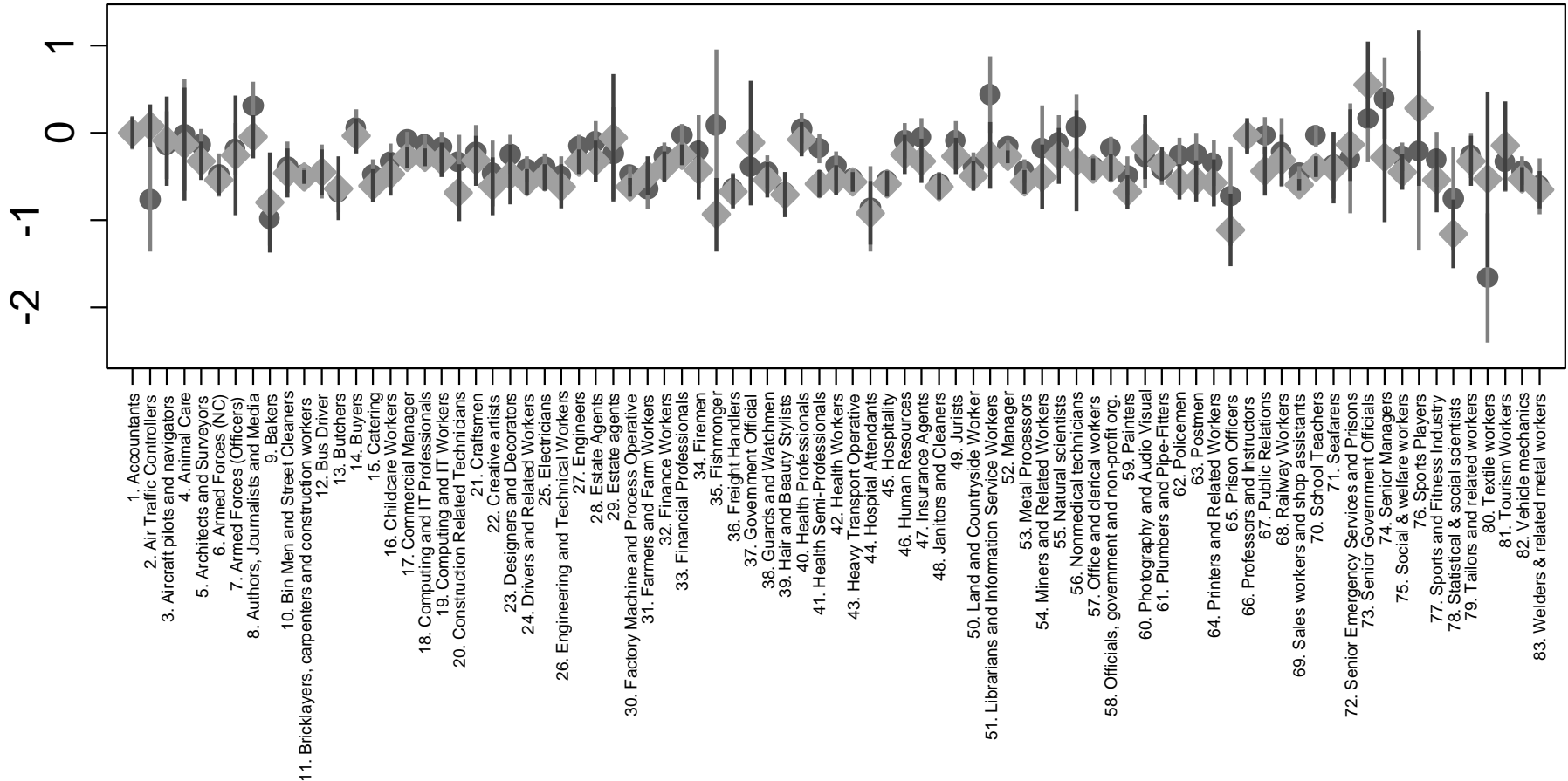
Data: Millennium Cohort Study (SN6411). n = 14,485.

Note: Model also contains gender, ethnicity and parental education.

!!Warning: Includes Small Categories

Test Scores (Age 7)

Coefficient and 95% Quasi-Confidence Interval



● Reading ◆ Maths

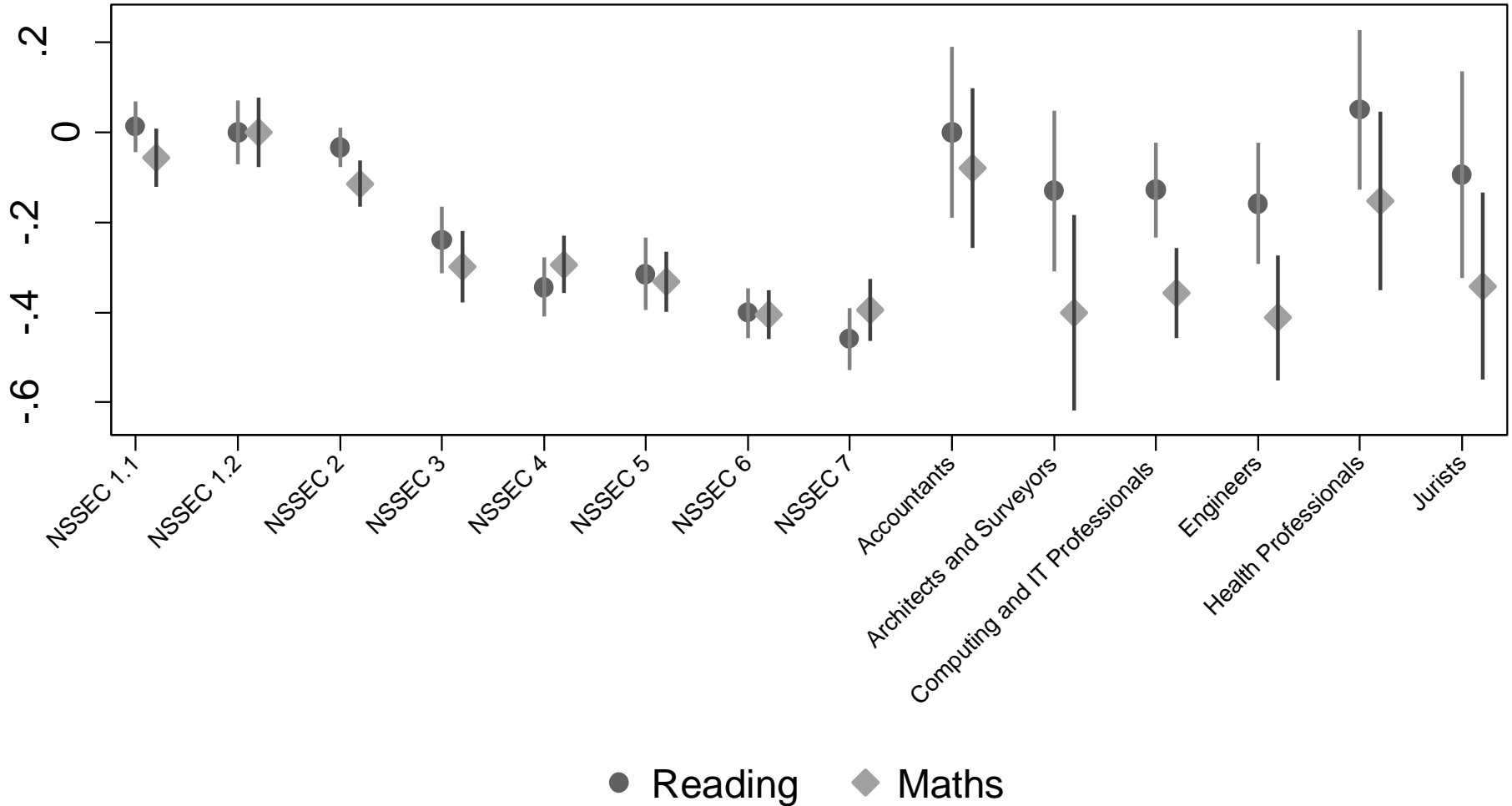
Data: Millennium Cohort Study (SN6411). n = 14,485.

Note: Model also contains gender, ethnicity and parental education.

Reading Test Scores (Age 7)

NSSEC and Large Micro-Classes (mostly) in NSSEC 1.2

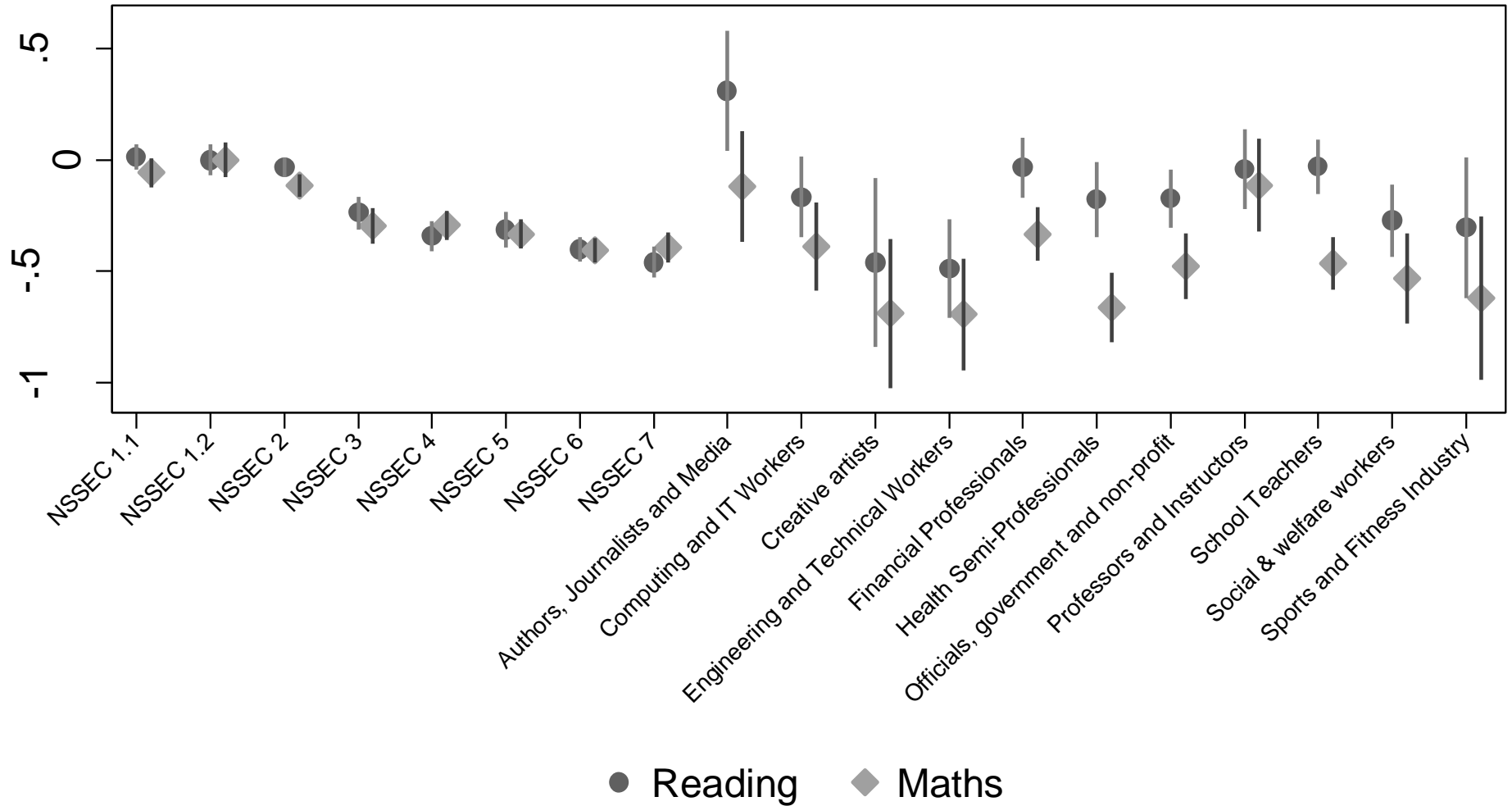
Coefficient and 95% Quasi-Confidence Interval



Data: Millennium Cohort Study (SN6411). n = 14,485.
 Note: Model also contains gender, ethnicity and parental education.
 Large Micro-Classes with a large number of occupations in NSSEC 1.2

Reading Test Scores (Age 7) NSSEC and Large Micro-Classes (mostly) in NSSEC 2

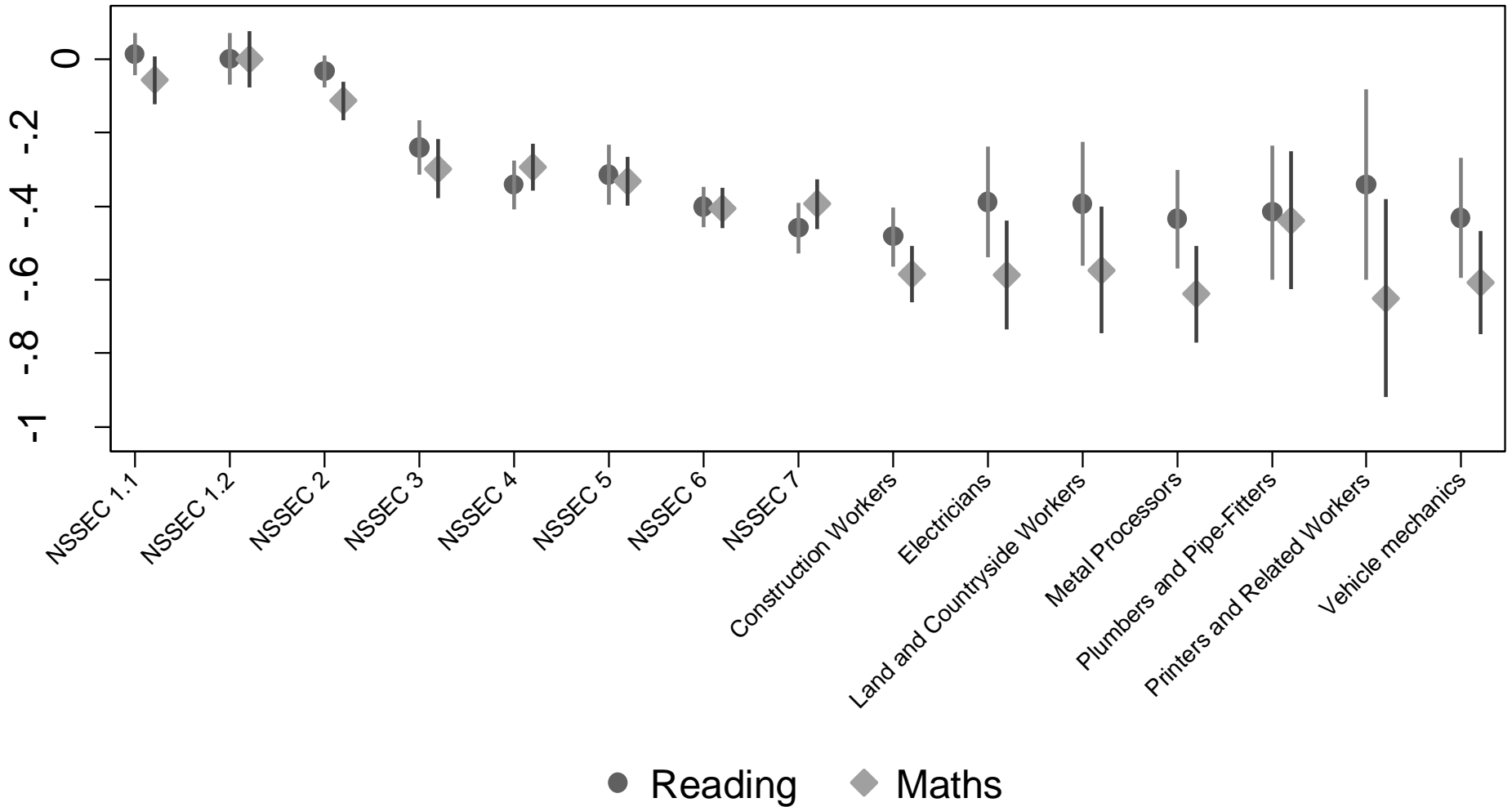
Coefficient and 95% Quasi-Confidence Interval



Data: Millennium Cohort Study (SN6411). n = 14,485.
Note: Model also contains gender, ethnicity and parental education.
Large Micro-Classes with a large number of occupations in NSSEC 2

Reading Test Scores (Age 7) NSSEC and Large Micro-Classes (mostly) in NSSEC 5

Coefficient and 95% Quasi-Confidence Interval



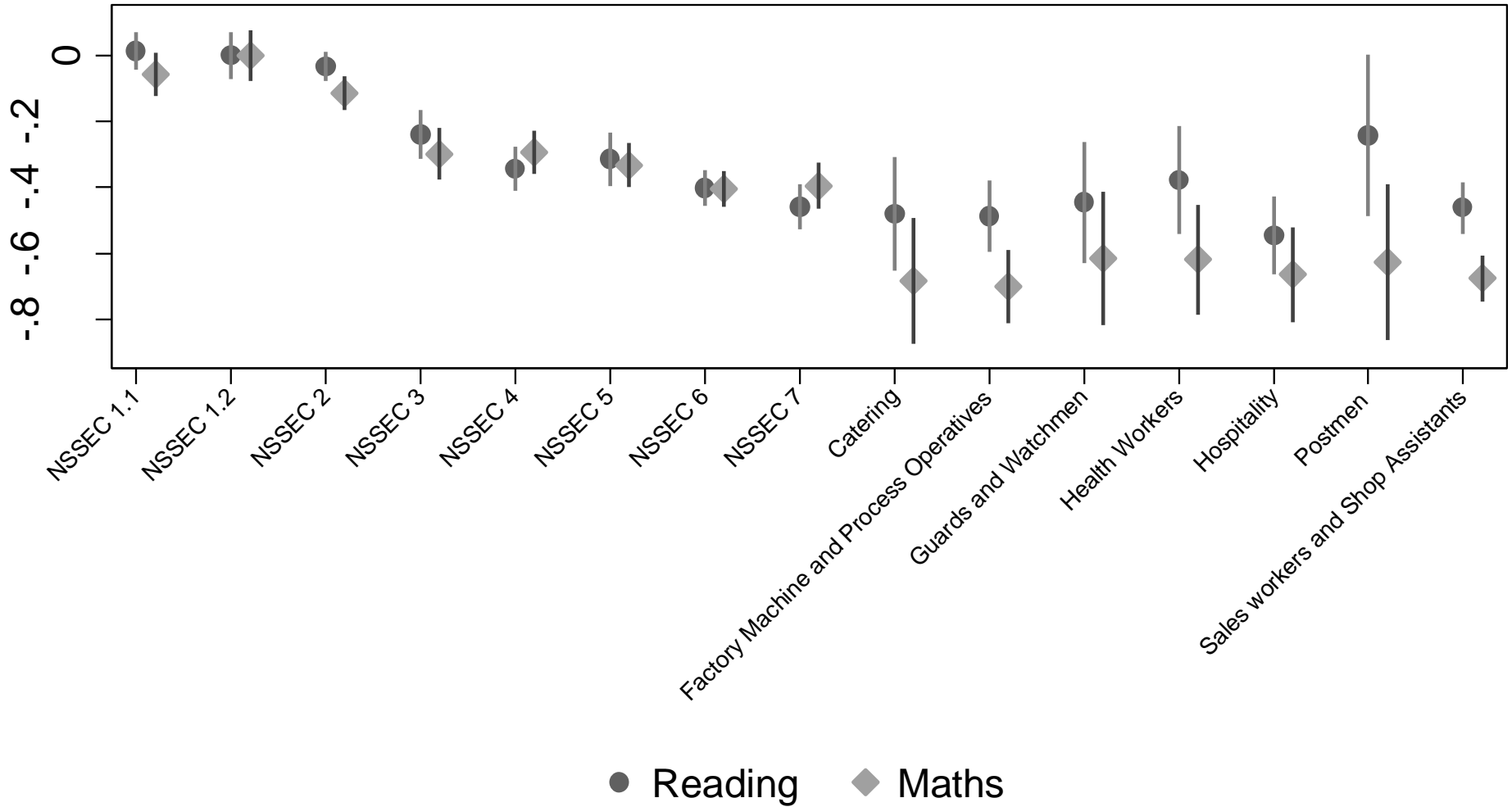
Data: Millennium Cohort Study (SN6411). n = 14,485.

Note: Model also contains gender, ethnicity and parental education.

Large Micro-Classes with a large number of occupations in NSSEC 5

Reading Test Scores (Age 7) NSSEC and Large Micro-Classes (mostly) in NSSEC 6

Coefficient and 95% Quasi-Confidence Interval



Data: Millennium Cohort Study (SN6411). n = 14,485.
Note: Model also contains gender, ethnicity and parental education.
Large Micro-Classes with a large number of occupations in NSSEC 6

Conclusions

- ▶ Exploratory analysis of the variation in reading and mathematics scores between micro-classes.
 - Are there additional insights to be gained from examining attainment beyond the big class level?
Yes
 - Are there differential patterns of attainment in reading and maths?
Possibly

Roxanne Connelly
(R.Connelly@warwick.ac.uk)

Vernon Gayle
(Vernon.Gayle@ed.ac.uk)

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