The unintended consequences of quantifying quality: Does ranking school performance shape the geographical concentration of advantage?

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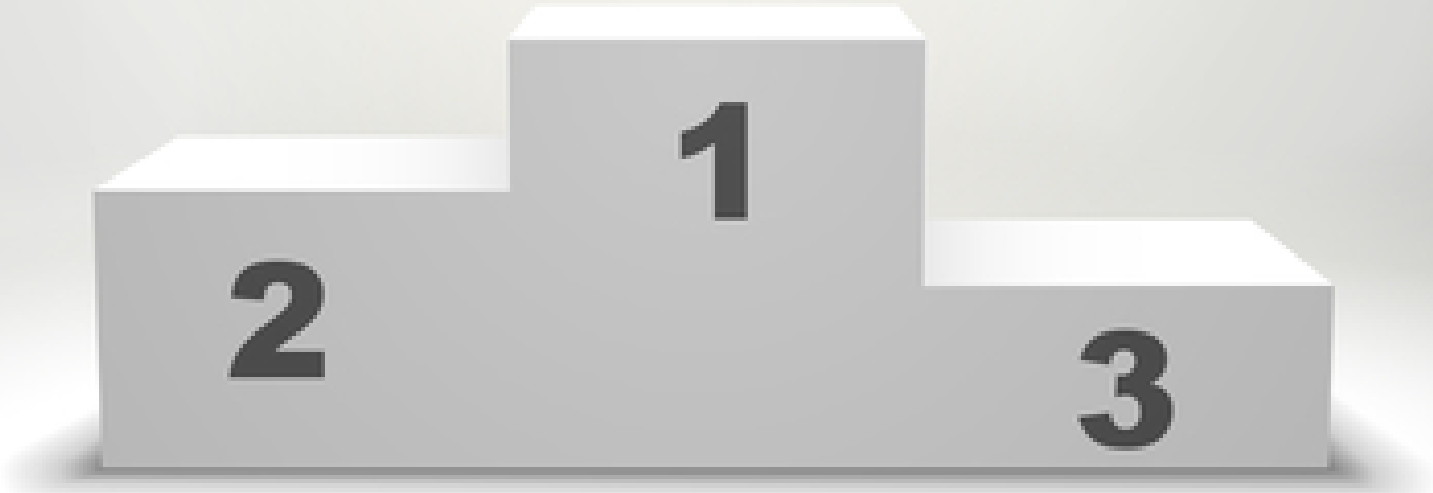


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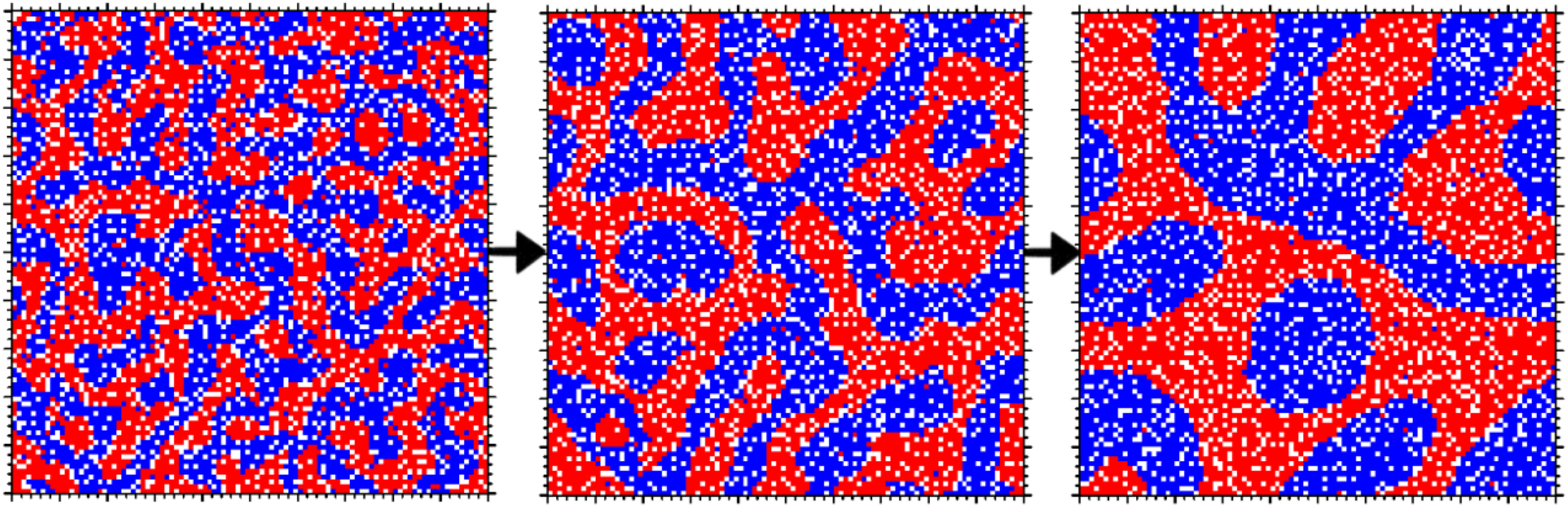
Where you grow up can 'undermine... social and economic well-being' (Massey and Denton 1993).

Two debates: trends in and drivers of residential segregation (Reardon et al. 2018)

Increasing polarisation is partly driven by individual preferences for people who are perceived to be like themselves (Schelling 1971)



‘Preferences alone may be insufficient to account for the high levels of segregation observed in [some] cities’

Bruch, Elizabeth E., and Robert D. Mare. ‘Neighborhood Choice and Neighborhood Change’. American Journal of Sociology 112, no. 3 (November 2006): 667–709.

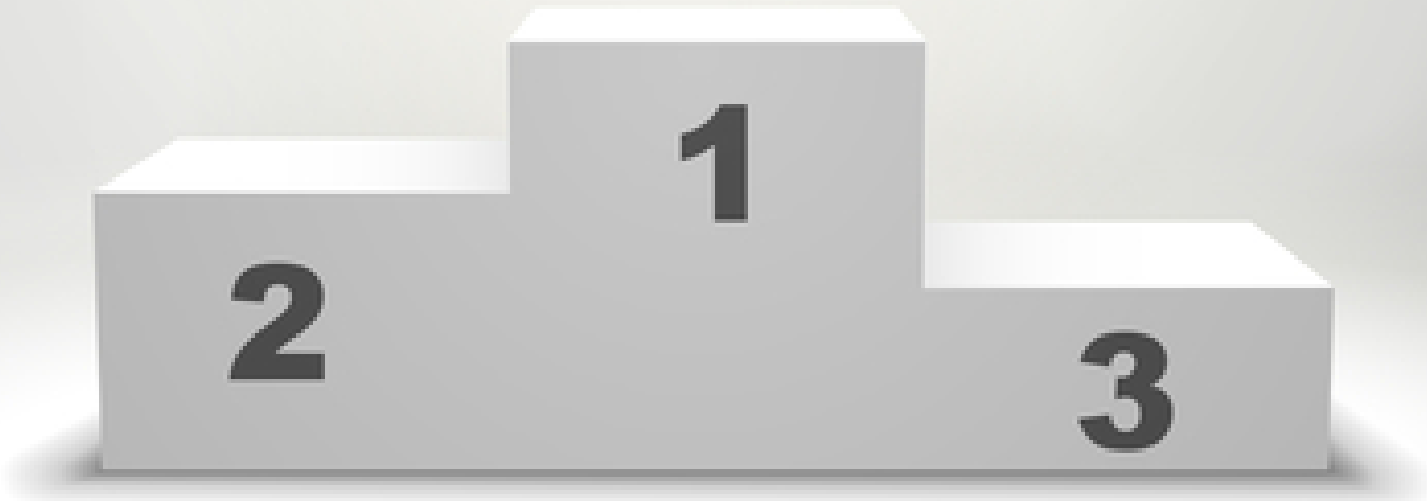
Income inequality (Bischoff and reardon, 2014)

Institutions have been somewhat 'neglected' (Allard and Small 2013)

Education is potentially important because 'income segregation increased only among families with children' (Owens, 2016)

How institutions may 'structure neighborhood conditions' through shaping residential segregation (Allard and Small 2013; Sharkey and Faber 2014)

School League Tables



People care about access to good services when they move (Kane, Riegg, and Staiger 2006)

The quantification of school quality

Different social groups seem to use the information provided in school league tables in different ways (Figlio and Lucas 2004).

‘A WORKING CLASS DISCOURSE DOMINATED BY THE PRACTICAL AND THE IMMEDIATE AND A MIDDLE CLASS DISCOURSE DOMINATED BY THE IDEAL AND ADVANTAGEOUS’ (BALL, BOWE, AND GEWIRTZ 1995: 419).

Financial constraints and house prices (Gibbons, Machin, and Silva 2013; Machin 2011)

The power of quantification

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Informal assessments of school quality (Francis and Hutchings 2013).

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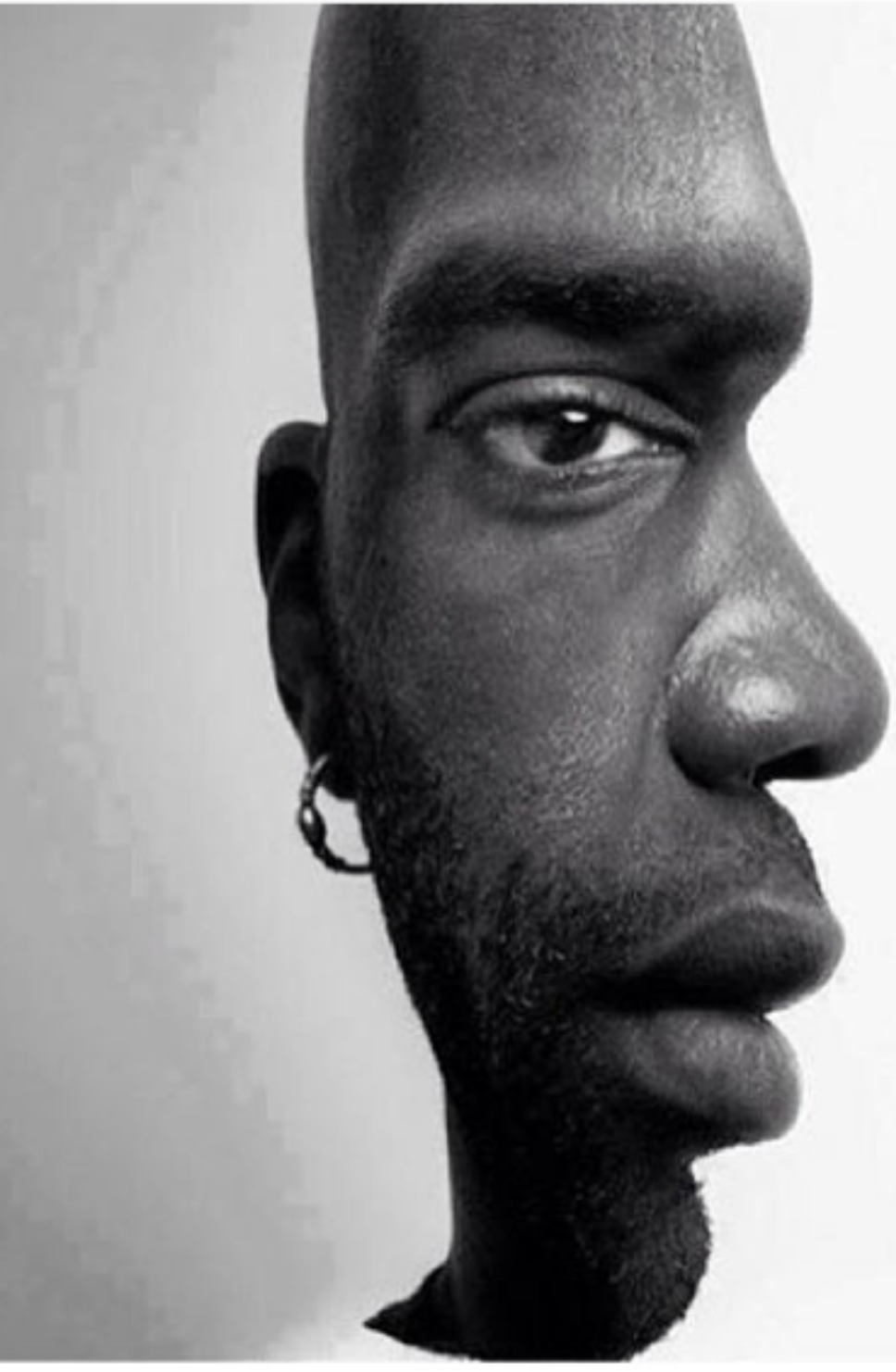
Rankings reorganise status hierarchies and reconfigure standards of what is considered 'good' (Espeland and Sauder 2016)



Publishing school league tables may have changed how some parents looked at their local schools

Mixed evidence?

Little consensus on whether school choice reforms contributed to school segregation

No detrimental effect on school segregation, and may have even had a small positive effect (Fitz, Gorard, and Taylor 2003; Gorard and Fitz 1998)

Increased degree of school segregation (Noden 2000).

Similar debates have been occurring in the US (Owens 2016; Reardon and Owens 2014; Hasan and Kumar 2018).

Did the introduction of school league tables influence the degree of residential segregation?

Empirical implications

1. Areas with higher performing schools will see an increase in the share of more advantaged individuals

2. Post-reform, advantaged individuals will be more likely to move to areas with:
   - 2.1 better performing schools
   - 2.2 greater professional managerial populations

3. These changes in the link between social class and residential segregation will be concentrated among individuals who are parents of school age or younger children

Our approach

1. Use aggregate census data to investigate the association between school quality and changes in occupational class composition.

2. Use individual-level panel data from ONS Longitudinal Study to examine whether patterns of individual residential mobility change after league tables are introduced in the 1990s (Leckie and Goldstein 2011).

Census data from England 1981-2011

Aggregate level study uses data from 1991-2011 censuses (from Casweb/Infuse).

Individual level study uses data from ONS Longitudinal Study (LS).

The LS is a 1% sample of English and Welsh populations which links census records since 1971 with life event data (births, deaths, cancer registrations). We use census data from 1981-2011.

Occupational class

Using NSSEC classes to measure advantage and disadvantage (proxied before 2001).

Our primary focus is on professional managerial and routine and semi-routine occupations – representing relatively advantaged and disadvantaged groups respectively. Intermediate classes grouped.

Measuring school performance

Aim to recreate the information in school league tables that parents are responding to.

% achieving 5 A*- C at GCSE has major influence on media/policy discussion.

Simple measures affect house prices, unlike value-added (Imberman and Lovenheim 2016).

Our measure is % of students in mainstream schools in a local authority achieving 5 A*-C over the periods 1994-2000 and 2002-11.

Thanks to Steve Gibbons and Sandra McNally for sharing data on School League Tables with us!

Geographical areas based on local authority districts

As schools do not have strictly defined district boundaries in UK we use smallest administrative areas consistently available over time pre and post league table introduction: local authority districts (LAs).

Deal with boundary changes by aggregating overlapping areas. 320 areas in total (compared to 326 that existed in 2011).

Geographic scale, moving, and sorting

Our focus is not on why people move, but on where they go when they leave an area (assume people leave an area (e.g. for work) and have some choice over where they live).

Lots of residential mobility to get into good schools happens within small areas (see Gingrich and Ansell 2014).

School choice within areas heavily influenced by word-of-mouth (see e.g. Burdick-Will et al 2020). Between area design is advantageous because these influences are less likely to operate.

Why our approach is distinctive

Much longer time frame (impact of league tables may only occur over medium to long term and residential mobility is a rare event).

Aim to create 'control groups': behaviour before league table introduction, sub-groups such as parents vs those without children.

Focus on occupational class rather than binary FSM indicator – important if league tables affect behaviour of advantaged more than disadvantaged (unlike e.g. Burgess, Wilson, and Worth 2013).

Acknowledgements:

The permission of the Office for National Statistics to use the Longitudinal Study is gratefully acknowledged, as is the help provided by staff of the Centre for Longitudinal Study Information & User Support (CeLSIUS). CeLSIUS is supported by the ESRC Census of Population Programme (Award Ref: ES/K000365/1). The authors alone are responsible for the interpretation of the data.

Aggregate level study: Estimating the association between school quality and occupational class composition

Aggregate level study: class composition

Local-authority year level analysis using data from 1991-2011

Outcome variables: Share of professional managerial and share semi-routine/routine

Aggregate level study: controls

Ethnic/immigrant composition (% born outside the UK)

Degree of poverty/presence of job opportunities (unemployment rate)

% living in social housing (the extent to which individuals can live in an area without paying market prices)

% employed in manufacturing (the presence of well-paying jobs for low skilled individuals)

Logged population density (urbanisation).

Aggregate level study: methods

Main specification:

$$\begin{aligned}\delta\mathrm{ClassShare}_{\mathrm{it}} =& \alpha + \beta_1 \mathrm{SchPerf}_{\mathrm{it}} + \beta_2 \mathrm{ClassShare}_{\mathrm{it}-1} \\ &+ \delta X_{it} + t + region_r + \epsilon_{it} \qquad (1)\end{aligned}$$

OLS regression models with region and year FEs

Controls: lagged class shares, some models adjust for changes in economic/social covariates.

Standard errors clustered at local authority level.

League tables and class concentration

	Change in prof./ managerial share		Change in (semi-) routine share	
Covariates	(1)	(2)	(3)	(4)
School performance	0.005* [0.01, 0.09]	0.12*** [0.009, 0.15]	-0.02 [-0.05, 0.001]	-0.07*** [-0.09, -0.04]
Controls	N	Y	N	Y
N	640	640	640	640
R^2	0.891	0.917	0.806	0.856

Notes: OLS models. 95% confidence intervals in brackets. * p < 0.05, ** p < 0.01, *** p < 0.001. School performance data is % of children in a local authority achieving 5+ A*-C grades at GCSE over the periods 1994-2000, and 2002-2011. Class composition and covariate data from 1991-2011 Censuses and school performance data from Department for Education. All models include lagged class share and year and region FEs

Individual level study: association between social class, presence of children, and school quality of area among residentially mobile individuals.

Individual level empirical implications of league table introduction

We predict that:

1. Professional managerial parents become more likely to move to areas with high performing schools after introduction of league tables.
2. Professional managerial parents become more likely to move to areas with higher share professional managerial after introduction of league tables.
3. Over time class differences are greater among parents of school age children.

Data

Data from 1981-2011 Longitudinal Study (linked census records)

Focus on individuals who move local authority between t and t+1.

Restrict sample to individuals between 20-50 (30-60) – ages likely to have school-aged children in HH between t and t+1.

Measure presence of school-aged children in household at t or t+1.

Data contains 502,119 observations on 295,804 individuals. 115,582 moves between local authorities.

Outcome variables

1. Average school quality measured at LA level. This is averaged over time, and forecast backwards to 1991 before school league table introduction. This response variable is a counterfactual: justified by high over time correlation of performance

$$(r = .84)$$

2. Professional managerial share of population in area at t+1. To investigate implications of residential mobility for class concentration.

Individual level methods (1)

Basic logic of our approach is three way interaction between time, occupational class, and presence of children.

Between 2001 and 2011, probability of moving area 26% for professional managerial individuals, only 17% for semi-routine and routine.

Use Heckman selection model to deal with unequal probability of moving area.

Individual level methods (2)

First stage predicts probability of moving LA

Second stage – i.e. outcome model - is OLS regression

Both selection and outcome models control for gender, age, housing tenure, marital status, born in UK, education, ethnicity, and household economic status.

Selection equation also controls for area level variables used in aggregate study and average school performance at t.

Individual level methods (3)

$$
\begin{aligned}
\text{Quality}_{\text{it+1}} = & \beta_1 \text{OccClass}_{\text{it}} + \beta_2 \text{year}_{\text{t}} + \beta_3 \text{children}_{\text{it}} \\
& + \beta_4 \text{OccClass}_{\text{it}} \times \text{year}_{\text{t}} + \beta_5 \text{OccClass}_{\text{it}} \\
& \times \text{children}_{\text{it}} + \beta_6 \text{year}_{\text{t}} \times \text{children}_{\text{it}} + \\
& \beta_6 \text{year}_{\text{t}} \times \text{children}_{\text{it}} \times \text{OccClass}_{\text{it}} + \\
& \gamma \text{X}_{\text{it}} + \alpha + \lambda + \epsilon_{it} \qquad (2)
\end{aligned}
$$

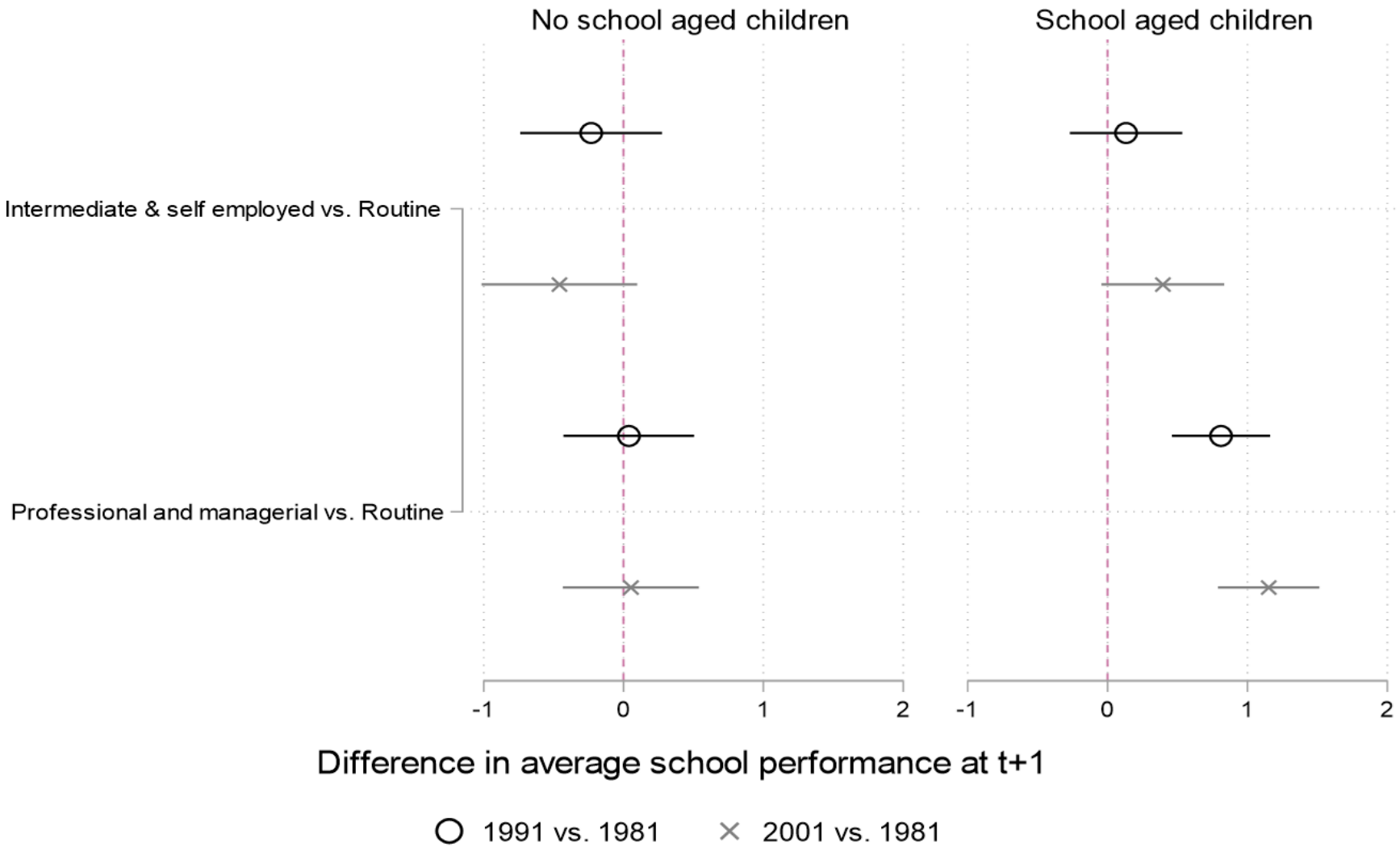
Individual level methods (4)

We test our predictions by calculating marginal means from Heckman selection model.

These allow us to estimate how social class differences in outcomes changes over time.

$$\begin{aligned}\hat{y}_{DiD} =& (\hat{y}_{ProfChild2011} - \hat{y}_{RoutineChild2011}) \\ & - (\hat{y}_{ProfChild1991} - \hat{y}_{RoutineChild1991}) \end{aligned} \quad (3)$$

Difference in average school performance at t+1



Contrasts of estimated marginal means from Heckman sample selection model. N (total) = 502,119. N (uncensored) = 115,582. Second stage of model includes controls gender, age, housing tenure, marital status, born in UK, education, ethnicity, and economic status. First stage additionally controls for average school performance at t, and LA level controls used in aggregate level study. School league table data from DfE 1994-2000, 2002-11. Individual level data from ONS Longitudinal Study.

Individual level results (1)

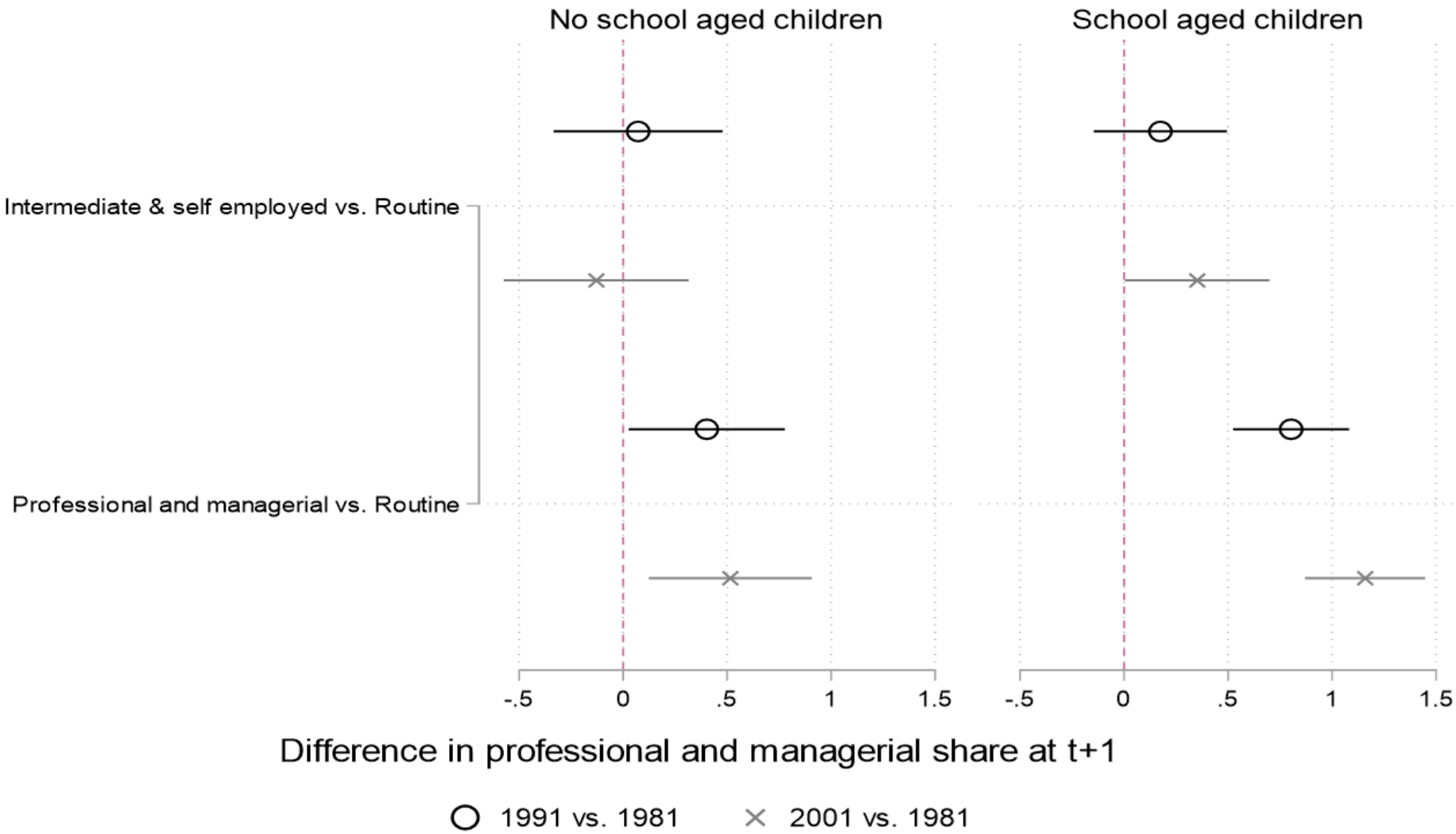
Class difference in average school performance at t+1 increased after 1991 (when school league tables introduced).

Association only visible comparing professional managerial to semi-routine and routine.

Association only appears among individuals with school aged children in HH at t or t+1.

These are in line with theoretical predictions, though effect size is small – 1 percentage point.

Difference in professional and managerial share at t+1



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Individual level results (2)

Individuals in professional managerial classes tend to live in areas with higher professional managerial shares after introduction of school league tables relative to semi-routine individuals.

Once again result is stronger for individuals with school aged children.

Conclusion

Summary of key findings

Publishing league table data has increased the geographical concentration of advantage.

Areas with higher performing schools see increases in professional managerial population.

After the introduction of school league tables, parents in more advantaged social classes became more likely to move to areas with higher performing schools, and more advantaged populations.

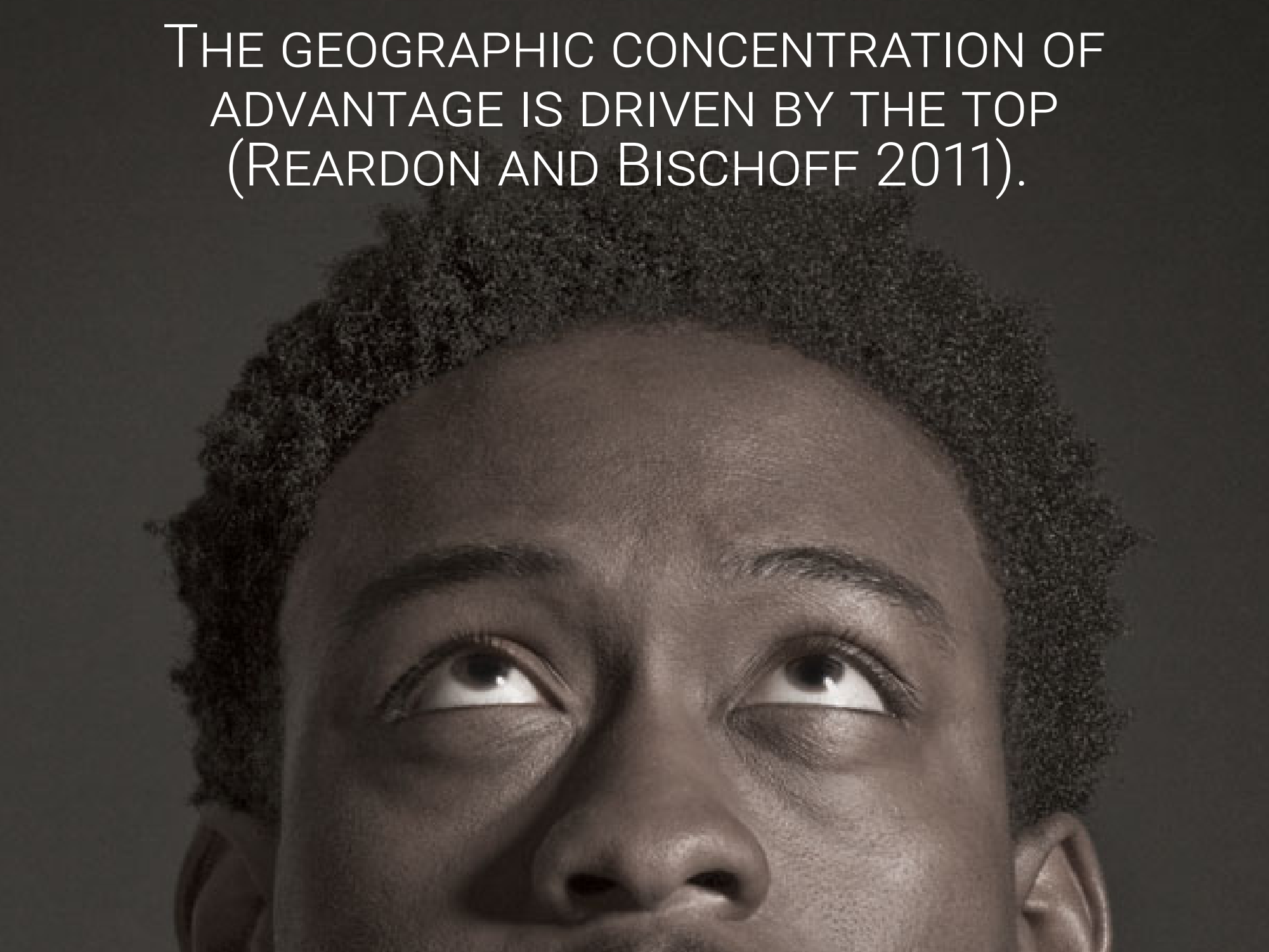
Putting this in context

‘INCOME SORTING ON ITS OWN ACCOUNTS FOR LESS THAN A QUARTER… OF THE OBSERVED DIVERGENCE ACROSS REGIONS’

Manduca, Robert A. ‘The Contribution of National Income Inequality to Regional Economic Divergence’. Social Forces. Accessed 26 March 2019.

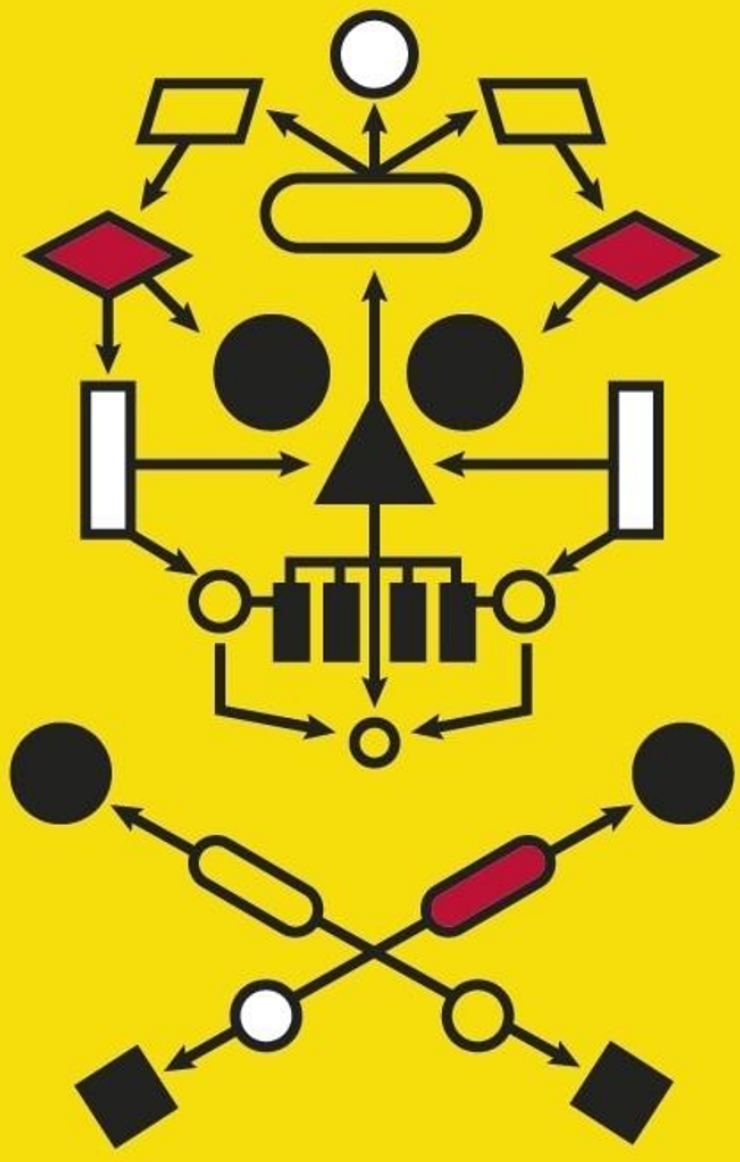
The causes and consequences of residential segregation (Sampson and Sharkey 2008)

The geographic concentration of advantage is driven by the top (Reardon and Bischoff 2011).

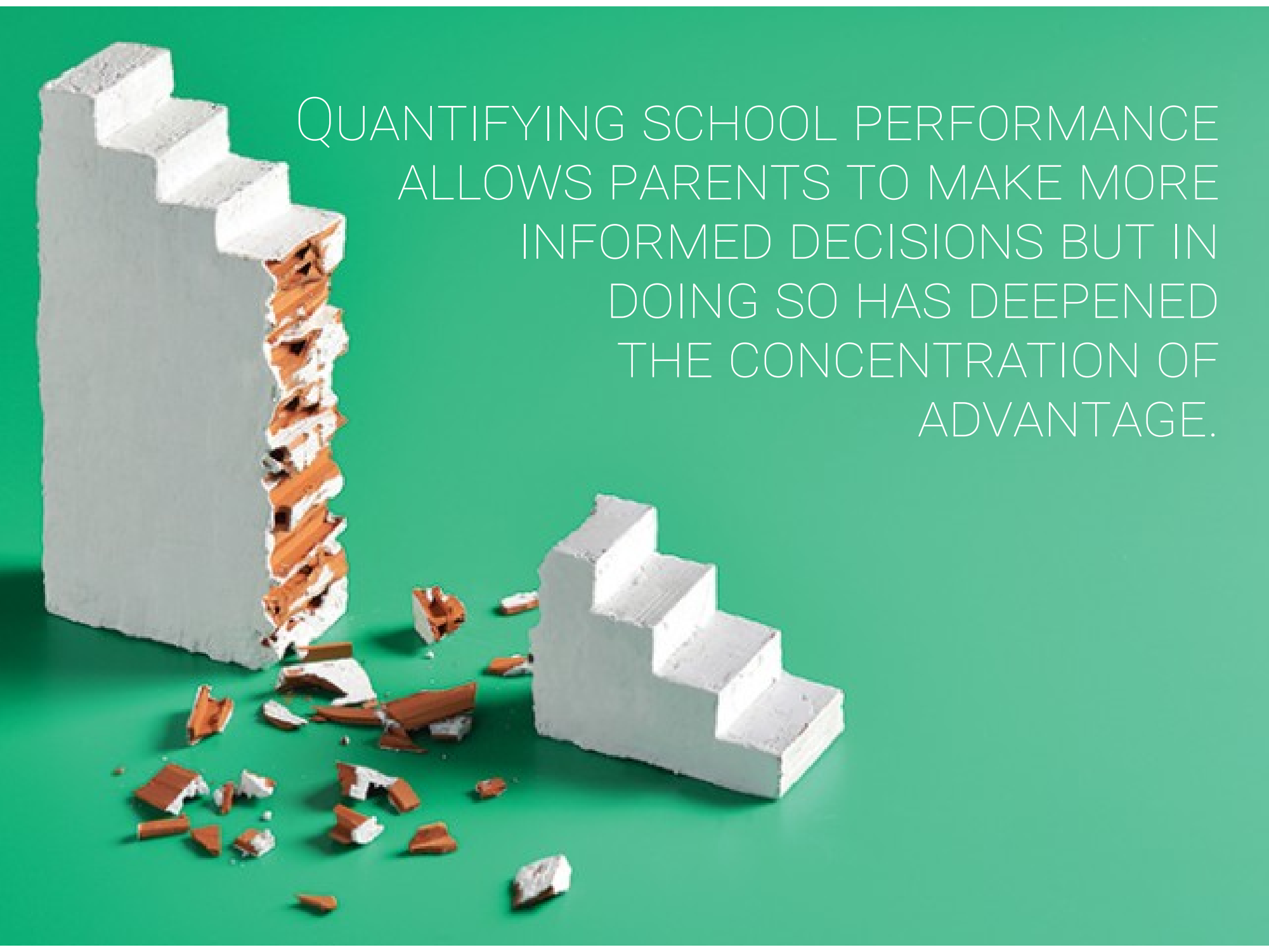


Institutions create the environments in which norms and information are transmitted (Galster 2012; Allard and Small 2013)


Quantification can remake social inequalities by 'recreating social worlds' (Espeland and Sauder 2007; Shore and Wright 2015))



Quantification influences the reproduction of inequality within society (Luca and Smith 2013; O'Neil 2016).


Quantifying school performance allows parents to make more informed decisions but in doing so has deepened the concentration of advantage.

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