

Modelling Parental Occupations and Filial Educational Attainment

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**Modelling Key Variables in Social Science Research
Research Seminar
Royal Statistical Society**

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Structure

1. Measuring key variables
2. General Certificate of Secondary Education (GCSE)
3. Youth Cohort Study of England and Wales
4. Analyses
5. Comments
6. Conclusions

Measuring Key Variables

- Measuring education

The question of how to measure education and qualifications, or indeed what 'measure' means raises a difficult issue, since there is no agreed standard way of categorising educational qualifications

(Prandy, Unt and Lambert 2004)

Measuring Key Variables

- Occupations and occupation based classifications

Forty years ago, Bechhofer's review of the use of occupational information in sociology bemoaned the abundance of, and inconsistencies between, occupationally based social classifications, noting that “..researchers are advised not to add to the already existing plethora of classifications without very good reason” (1969 p.118)

— However since that recommendation, the number of new classifications has increased steadily

- *Many measures – which one should we use?*

— *We argue for a transparent use of classifications that have ‘agreed’ standards of measurement in order to facilitate replication and aid comparisons within and across sociological and educational analyses*

Presentation Focus

Modelling Parental Occupations

Filial Educational Attainment

GCSE Attainment in Year 11 (age 15/16)

General Certificate of Education

- General Certificate of Secondary Education (GCSE) introduced in the late 1980s
- The standard qualification for pupils in England and Wales in year 11 (aged 15/16)
- Usually a mixture of assessed coursework and examinations
- Generally each subject is assessed separately and a subject specific GCSE awarded
- It is usual for pupils to study for about nine subjects, which will include core subjects (e.g. English, Maths and Science) and non-core subjects
- GCSEs are graded in discrete ordered categories
- The highest being A*, followed by grades A through to G (A* from 1994)

Why Explore GCSE Attainment?

- GCSEs are public examinations and mark the first major branching point in a young person's educational career
- For some pupils GCSE are the only qualification they ever achieve
- Poor GCSE attainment is a considerable obstacle which precludes young people from pursuing more advanced educational courses
- Young people with low levels of GCSE attainment are usually more likely to leave education at the minimum school leaving age and their qualification level frequently disadvantages them in the labour market
- Low levels of qualifications are also likely to have a longer term impact on experiences in the adult labour market
- Therefore, we argue that gaps in GCSE attainment are sociologically important

Why Parental Occupation

- Occupations are a key measure of social stratification
- Maps onto wider sociological conceptions of social class
- Why not income or wealth?
 - 16/17 year olds are being questioned
 - fluctuation in income and wealth
 - parents' location on the age/income distribution
- Occupation is a proxy
 - lifetime income
 - life chances (and opportunities)
 - lifestyle & consumption patterns

Occupations or Income?

In this respect, we would argue that the use of socio-economic classifications in research is not simply to act as a proxy for income where income data themselves are unavailable. We use socio-economic classifications because they are measures designed to help us identify key forms of social relations to which income is merely epiphenomenal... It is also the case that socio-economic classifications are relatively more general and stable measures than income. Income is well known to fluctuate over the lifecycle; indeed panel data regularly reveals a high level of 'income churning' from year to year (for the UK see Jarvis and Jenkins 1997). What socio-economic classifications might reasonably be expected to proxy is the lifecycle/earnings profile.

(Rose and Pevalin 2003) *A Researcher's Guide to the National Statistics Socio-economic Classification*

Youth Cohort Study of England and Wales

- Major Longitudinal Study began Mid-1980s
- Designed to monitor behaviour of young people as they reach the minimum school leaving age and either stay on in education or enter the labour market
- Experiences of Education (qualifications); Employment; Training; Aspirations; Family; Personal characteristics & circumstances
- Nationally representative; Large sample size; Panel data (albeit short); Possible to compare cohorts (trends over time)
- Study contacts a sample from an academic year group (cohort) in the spring following completion of compulsory education
- The sample is designed to be representative of all Year 11 pupils in England & Wales
- Sample are tracked for 3 (sometimes 4) waves (called Sweeps) of data collection
- We concentrate on the cohorts attaining GCSEs (1990 - 1999)

Working with the YCS

- Documentation is very poor especially in the older cohorts – usually handwritten annotation on questionnaires (pdf) (compare this with the BHPS for example)
- Changes in qualifications, educational policy etc. adds complications
- Changes in questions, measures, coding and timing all add to the general confusion
- Recently harmonized dataset Croxford *et al.* (2007) **SN 5765**

YCS GCSE Variables

- No obvious single overall measure of GCSE attainment
- There are four harmonised measures of Year 11 GCSE attainment deposited with the SN5765 dataset
 1. The number of academic courses studied in year 11 (t0examst)
 2. The number of A* - C awards in year 11 exams (t0examac)
 3. The number of A* - F awards in year 11 exams (t0examaf)
 4. A point score based on the number and grade of GCSE awards (t0score)

YCS GCSE Variables

- We operationalize four measures

1. *5+ GCSEs at Grade A* - C*
2. The number of GCSEs at Grade A* - C
3. GCSE Points Score
4. GCSE Points Score (cohort standardized)

- Today we concentrate on GCSE Point Score (capped at 84 points)

A*/A=7; B=6; C=5; D=4; E=3; F=2; G=1

There are an infinite number of possible scores that could be assigned to the alphabetical grades ascribed to the levels of GCSE attainment

New QCA Scores A*=58; A=52; B=46; C=40; D=34; E=28; F=22; G=16

YCS Parental Occupation Measures

- Various (unsystematic) parental occupation measures deposited with individual YCS cohorts
- NS-SEC (8 and 3 category) deposited with **SN 5765**
- We have added additional measures not in **SN 5765**
 - Derived from data using GEODE Resources
 - www.geode.stir.ac.uk
 - www.dames.org.uk/

YCS Parental Occupation Measures

- Parental occupation (fathers and mothers)
 - Alternative measures constructed
 - In this example we concentrate on conventional dominance (father unless missing)
 - Other possibilities include semi-dominance, dominance based on CAMSIS, NS-SEC etc.
- Some of the measures are approximations because detailed parental employment status is not available

YCS Parental Occupation Measures

1. National Statistics Socio-economic Classification (NS-SEC) *9 category*
2. European Socio-economic Classification (ESeC) *9 category*
3. Erikson-Goldthorpe-Portocarero (EGP) *11 category*
4. National Statistics Socio-economic Classification (NS-SEC) *3 category*
5. Registrar General's Social Class (RGSC) *6 category*
6. Manual / Non-Manual (M/NM) *2 category*
7. Elias Skill (Skill) *4 category*
8. International Socio-Economic Index (ISEI)
9. CAMSIS: Social Interaction and Stratification Scale (CAMSIS)
10. New Earning Survey scores (NES)

YCS Parental Occupation Measures

Employment relations

- Erikson-Goldthorpe-Portocarero (EGP) *11 category*
- National Statistics Socio-economic Classification (NS-SEC) *9 category*
Widely used official measure
- European Socio-economic Classification (ESeC) *9 category*
Increasingly widely used and in a comparative context
- National Statistics Socio-economic Classification (NS-SEC) *3 category*
Simplified version of the official measure, common in social research

YCS Parental Occupation Measures

Other Categorical Measures

- Manual / Non-Manual (M/NM) 2 *category*
Work characteristics
- Elias Skill (Skill) 4 *category*
Skill level of job

YCS Parental Occupation Measures

Scales

- International Socio-Economic Index (ISEI)
Scale of socio-economic status
- CAMSIS: Social Interaction and Stratification Scale (CAMSIS)
Scale with Mean =50 (sd=15)

Income Related

- New Earning Survey scores (NES)
Estimated mean monthly earnings SOC90 derived from SARs New Earnings Survey income estimations (Dale et al. 1995)

The Analytical Focus

- Dataset Croxford *et al.* (2007) **SN 5765**
- 1990s cohorts (1990, 1993, 1995, 1997, 1999)
- Comprehensive school pupils
 - Free schooling
 - No educational selection
- Complete information on parental occupations and other measures (n=55120)
- Single level analysis – no school identifiers in YCS **SN 5765**

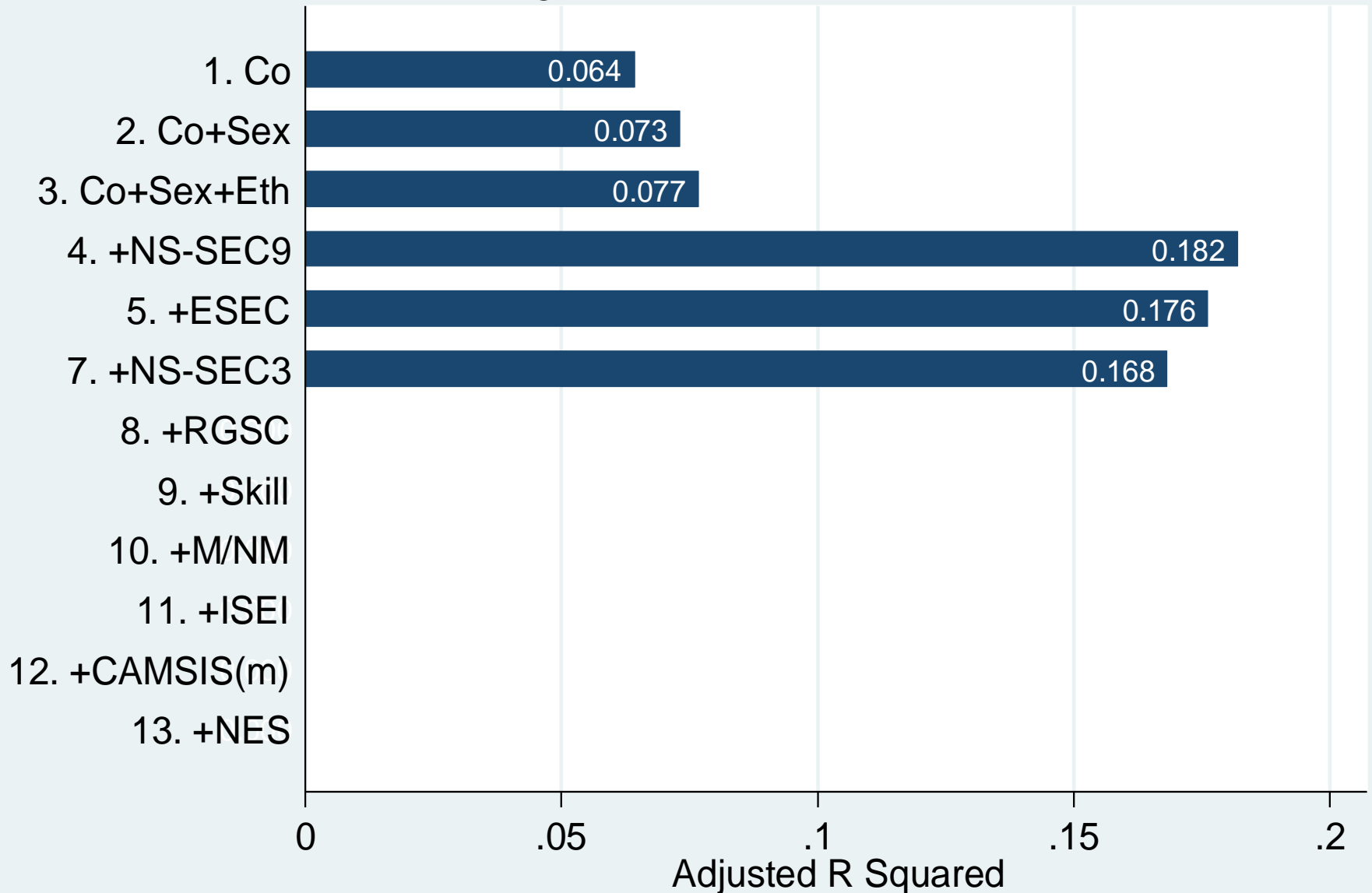
Summary of Results

Extended analyses of the Youth Cohort Study of England and Wales

- Overall trend
 - Increasing proportions getting the benchmark 5+GCSEs (A*-C)
 - Increasing mean number of A*-C grade GCSEs
 - Increasing mean GCSE points score
- Gender
 - Female pupils outperforming male pupils
- Ethnicity
 - Some groups doing better than white pupils (e.g. Indian pupils)
 - Other groups doing worse (e.g. Black pupils)
- Parental Occupation
 - Observable gradient
 - Lower levels of GCSE attainment from those pupils with less occupationally advantaged parents

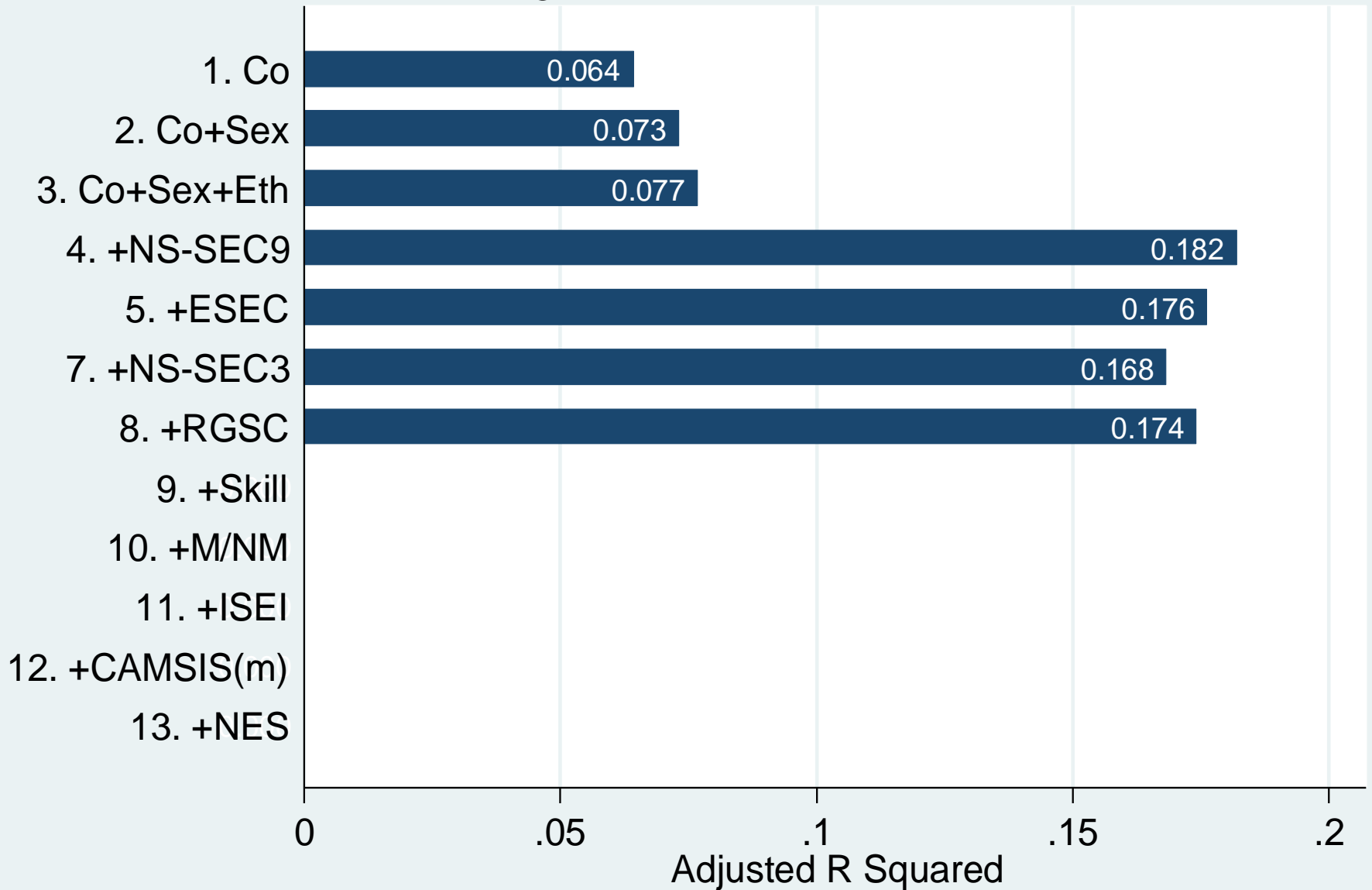
GCSE Attainment Year 11

Regression Models: GCSE Point Score



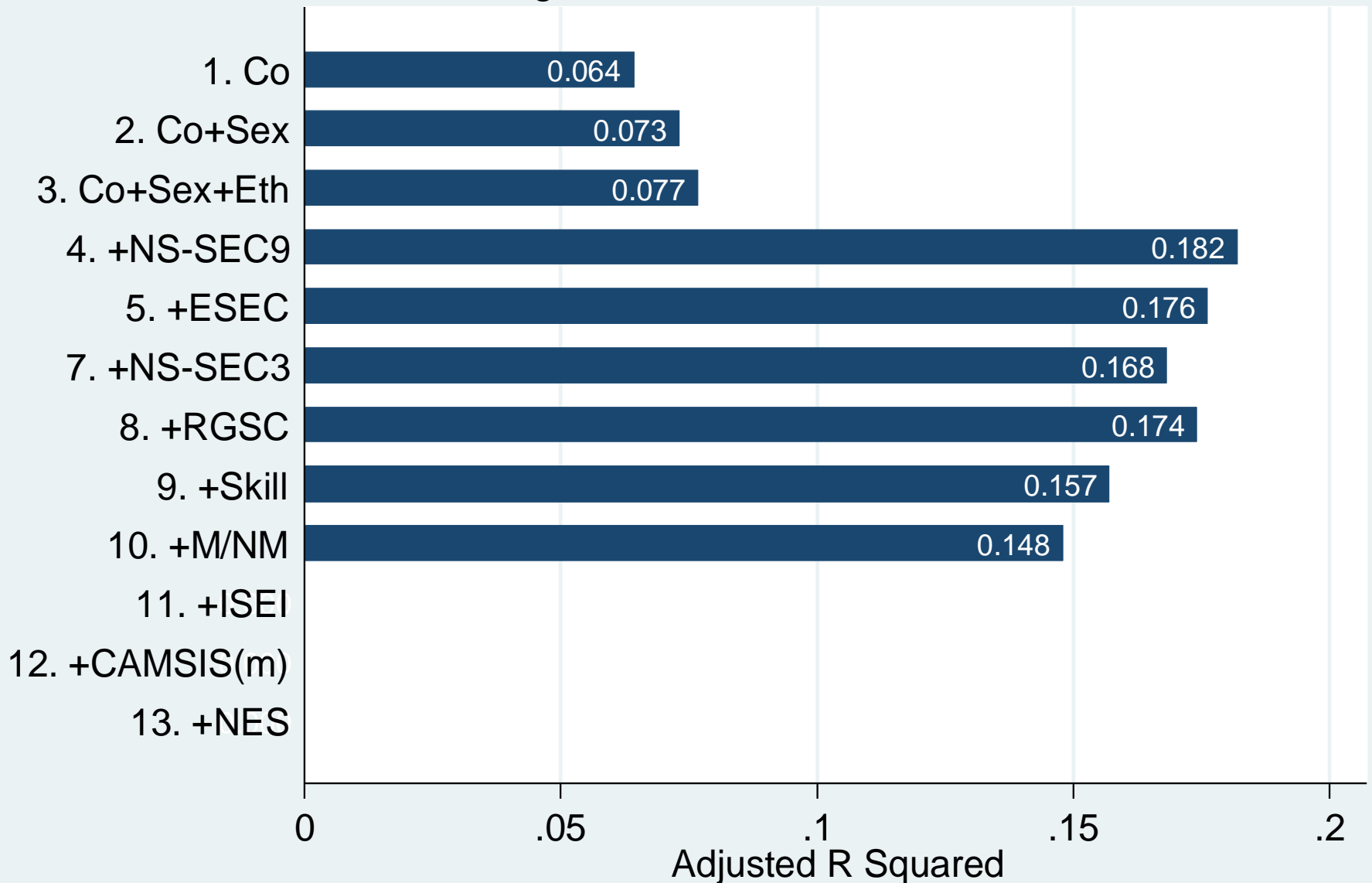
GCSE Attainment Year 11

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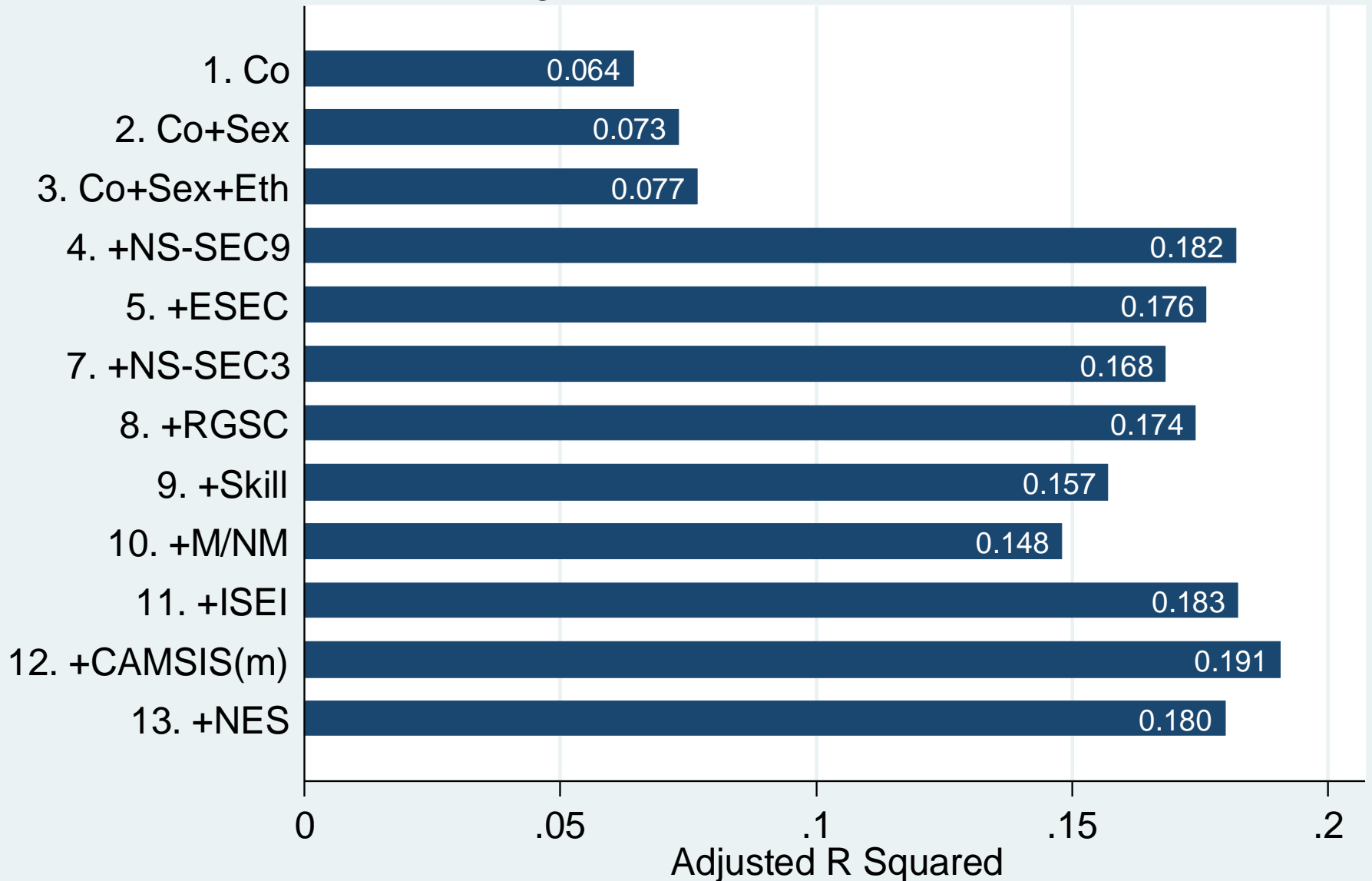
GCSE Attainment Year 11

Regression Models: GCSE Point Score



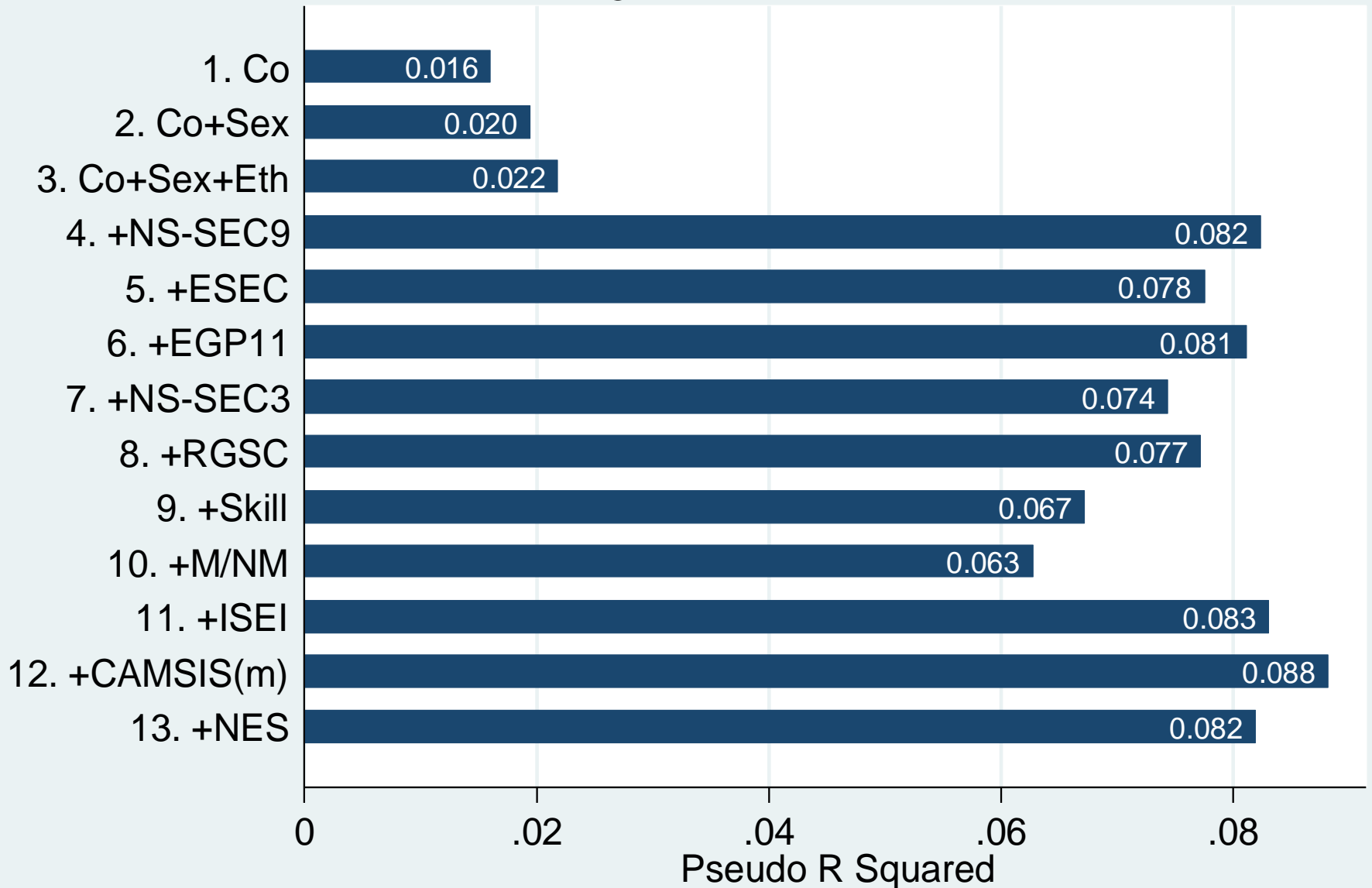
GCSE Attainment Year 11

Regression Models: GCSE Point Score



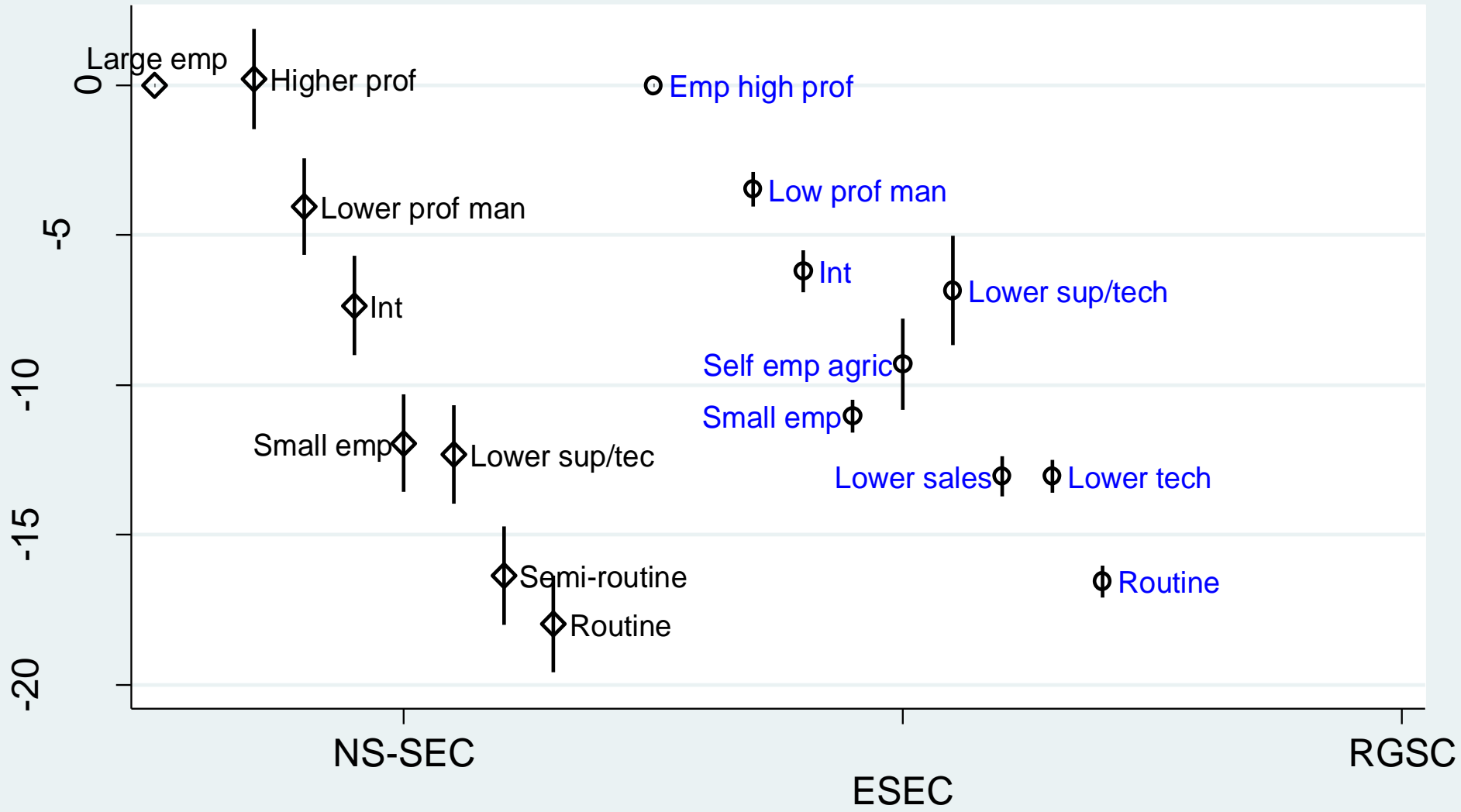
GCSE Attainment Year 11

Logit Models: 5+ GCSEs A*-C



GCSE Attainment Year 11

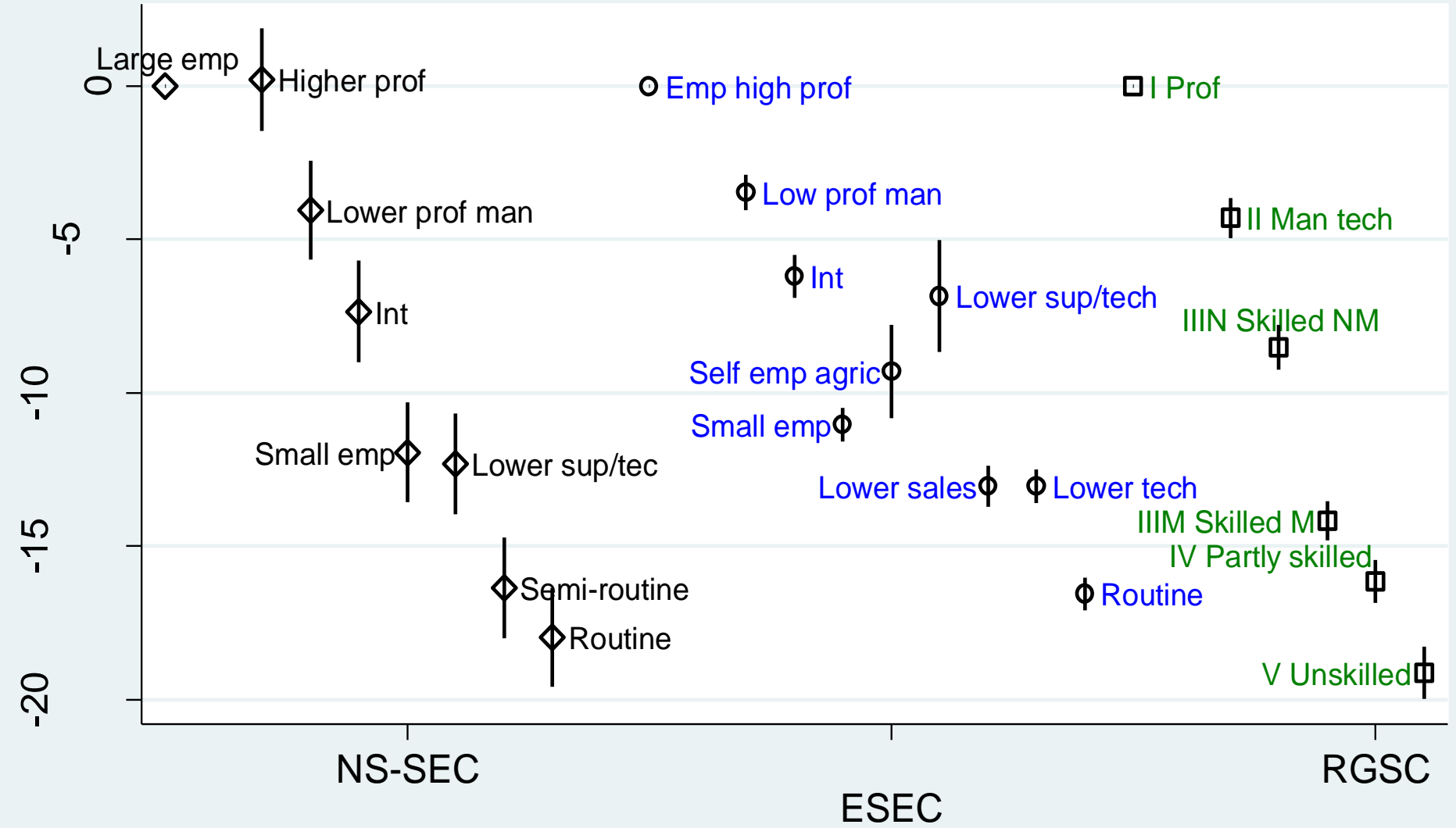
Regression Models (svy): GCSE Point Score



models include cohort, gender and ethnicity

GCSE Attainment Year 11

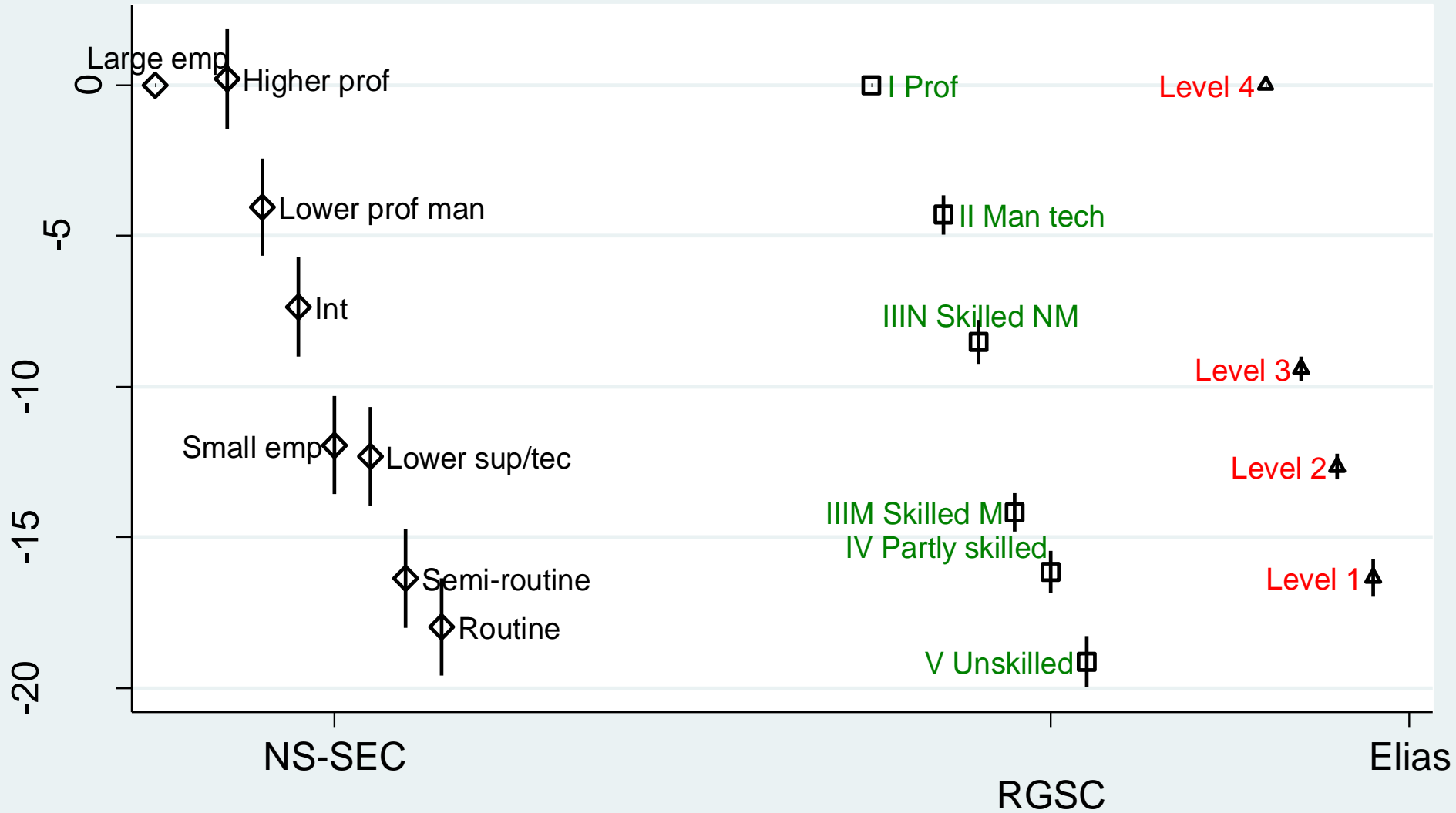
Regression Models (svy): GCSE Point Score



models include cohort, gender and ethnicity

GCSE Attainment Year 11

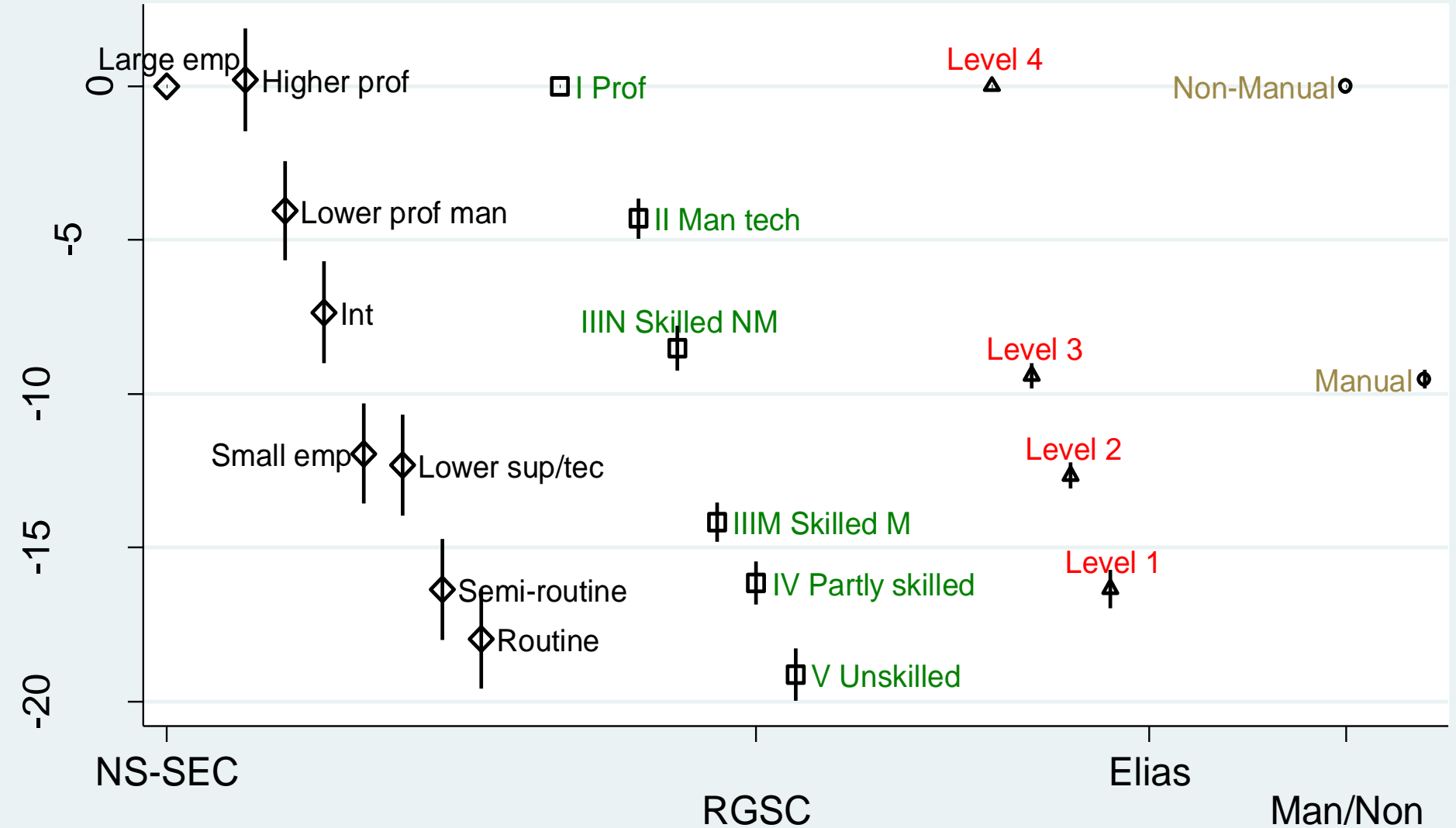
Regression Models (svy): GCSE Point Score



models include cohort, gender and ethnicity

GCSE Attainment Year 11

Regression Models (svy): GCSE Point Score



models include cohort, gender and ethnicity

Comment

- Overall position is that there are lots of different ways of ascribing categories to the occupational structure, but no compelling evidence, in this analysis, that there are hard boundaries between occupational groups
- The story this far...
 - Manual non-manual, skills bases and employment relations measures all work quite well
- Each of the categorical measures could be alternatively grouped (e.g. categories being disaggregated) resulting in meaningful differences between categories
- This suggests that no single categorical measure has a comprehensive set of appropriate categories

Conclusions

- Qualifications
 - No agreed standard way of categorising qualifications
 - Worth investigating/evaluating alternatives
- Occupational measures
 - Which scheme requires thought
 - Don't proliferate, stick to an agreed scheme
- In this example (GCSE)
 - Schemes and scales performed similarly
 - You can't know this *a priori* it has to be explored
 - They might not always do so (e.g. A' Level, specific subjects or entry to a Russell Group university)

Conclusions

- Sensitivity analyses
 - Are a good thing
 - Worth investigating/evaluating alternatives
 - Routine part of doctoral analyses
 - Paper journals (point to web published sensitivity analyses)
- Occupational measures with agreed standards
 - Critical for replication – a central pillar of the research process
 - Allow comparisons within (e.g. earlier and later YCS cohorts)
 - Facilitate comparison between studies (but be careful)
- DAMES – these resources will get you further
 - www.dames.org.uk