



Using Shiny as a teaching tool? Construction of the GBCS, NS-SEC, and Wright's Neo-Marxian Schema as an open-source class calculator application

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Project Overview

- Lost Sociology (Data Decay)
- Replication and Expansion of Existing Class Calculator
- Teaching Tools & Pedagogy



Great British Class Survey (Savage et al 2013)

Important period of social stratification history

Excellent display of “public sociology”

Prompted a lot of debate and critique (Mills 2014)

British class calculator

Traditional divisions of upper, middle and working class seem out of date in the 21st Century, no longer reflecting modern realities.

Leading sociologists from leading universities to analyse the modern British class system. They surveyed more than 161,000 people and made up of seven groups. To find out where you fit in use this calculator below.

Take the test

The results from BBC Lab UK's Great British Class Survey show a brand new class system of seven groups.

Answer five questions to see where you fit in:

Tell us about you

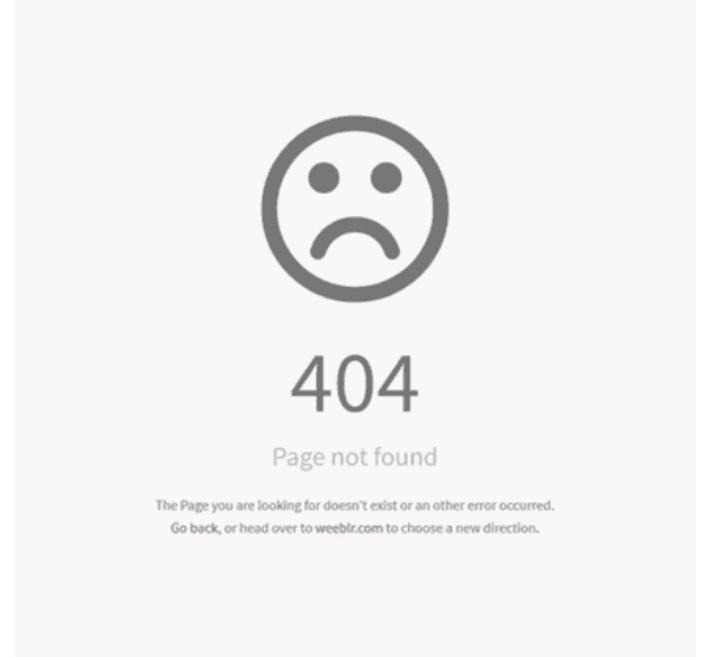


Great British Class Survey

Data Decay is a real issue

Not Open Source

Valuable Teaching Resource... But Limited in Scope





In Comes Shiny

An R package that allows for the development and deployment of “applets”

Open Source

Valuable Teaching Resource





Initial Project

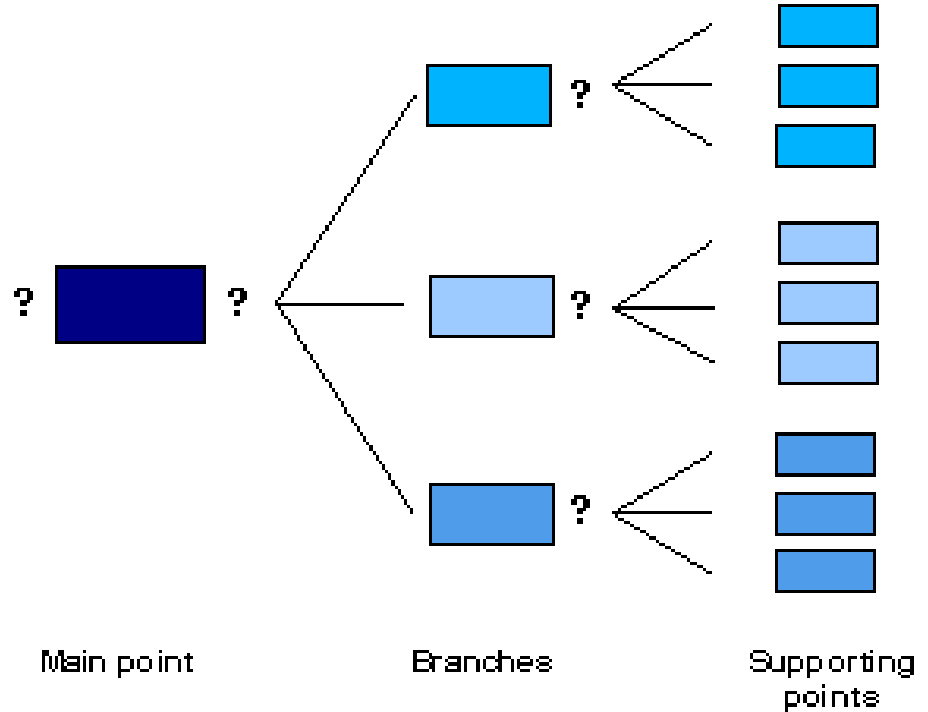
- (Somehow) Replicate the Original GBCS
- Improve if and where feasible
- Open Source in mind

Replication of GBCS

Problem: No Open-Source Logic Tree

Solution: Partial Information and user-testing

Took up significant portion of project





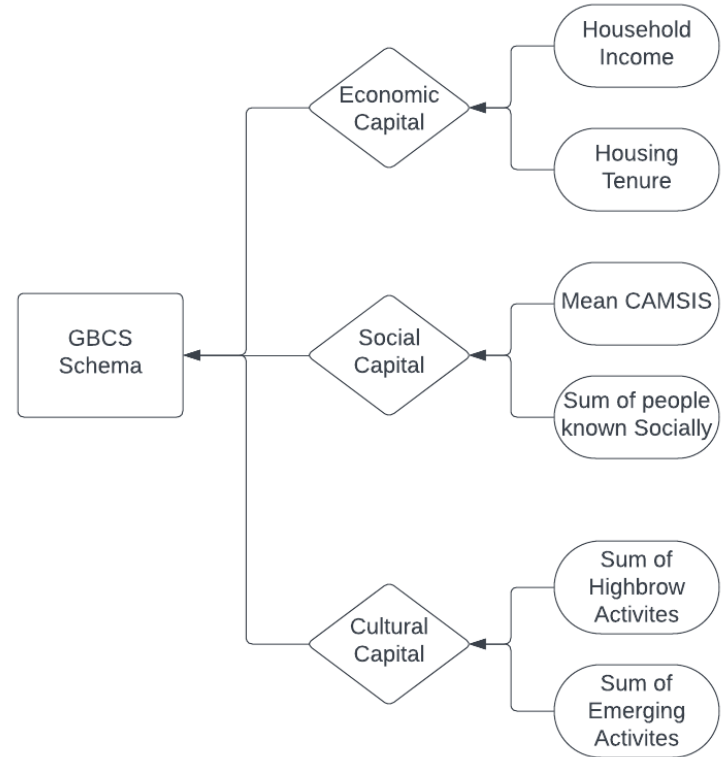
GBCS Schema

	% GfK	% GBCS	Description
Elite	6	22	Very high economic capital (especially savings), high social capital, very high highbrow cultural capital
Established middle class	25	43	High economic capital, high status of mean contacts, high highbrow and emerging cultural capital
Technical middle class	6	10	High economic capital, very high mean social contacts, but relatively few contacts reported, moderate cultural capital
New affluent workers	15	6	Moderately good economic capital, moderately poor mean score of social contacts, though high range, moderate highbrow but good emerging cultural capital
Traditional working class	14	2	Moderately poor economic capital, though with reasonable house price, few social contacts, low highbrow and emerging cultural capital
Emergent service workers	19	17	Moderately poor economic capital, though with reasonable household income, moderate social contacts, high emerging (but low highbrow) cultural capital
Precariat	15	<1	Poor economic capital, and the lowest scores on every other criterion

Replication of GBCS

GBSC logic tree very simple

Some questions missing in the logic tree that appear in the GBCS

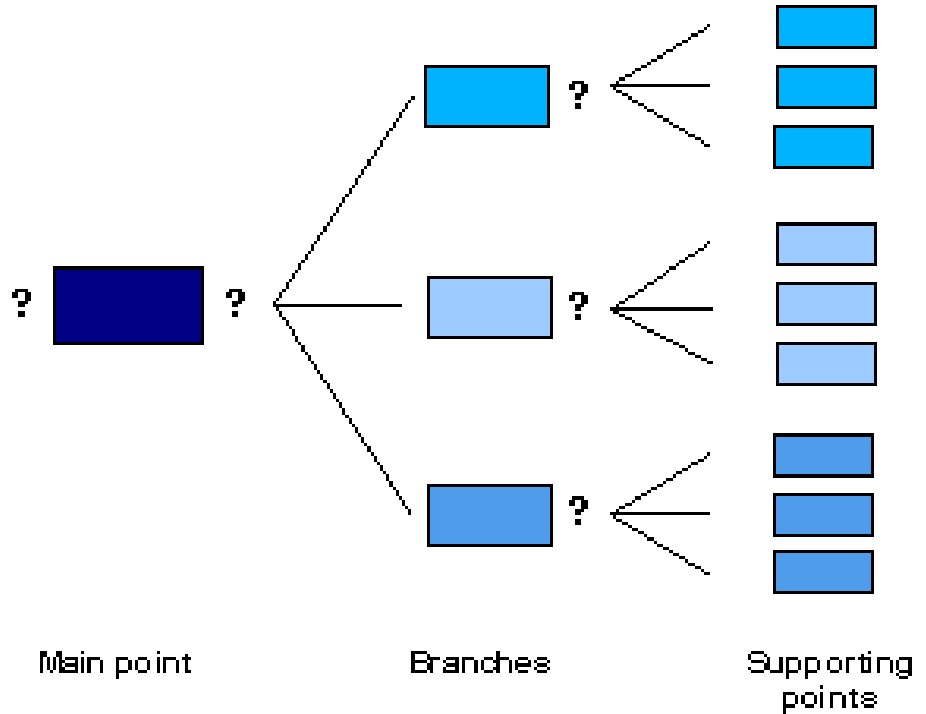


Replication of Wright

Logic tree firmly established in (Wright 1985)

Problem: Far too long

Solution: Produced a 'streamlined' Wright Schema





Replication of Wright

Streamlined logic tree

Trimmed some ‘organisational fat’

Everything else kept the same

Owners	Wage laborers			
1 Capitalists (10 or more employees)	4 Managers experts	7 Managers semi-skilled	10 Managers “unskilled”	+
2 Small employers (2–9 employees)	5 Supervisors experts	8 Supervisors semi-skilled	11 Supervisors “unskilled”	0
3 Petit bourgeoisie (no more than 1 employee)	6 Workers skilled	9 Workers semi-skilled	12 Workers “unskilled”	–
	+	0	–	Possession of skill or credential assets

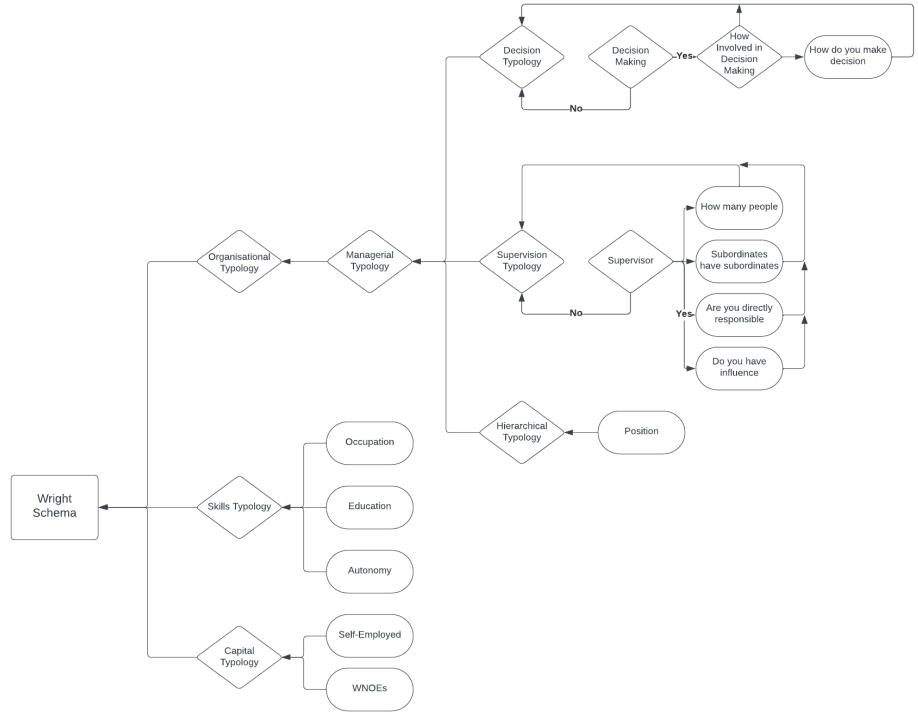


Replication of Wright

Streamlined logic tree

Trimmed some 'organisational fat'

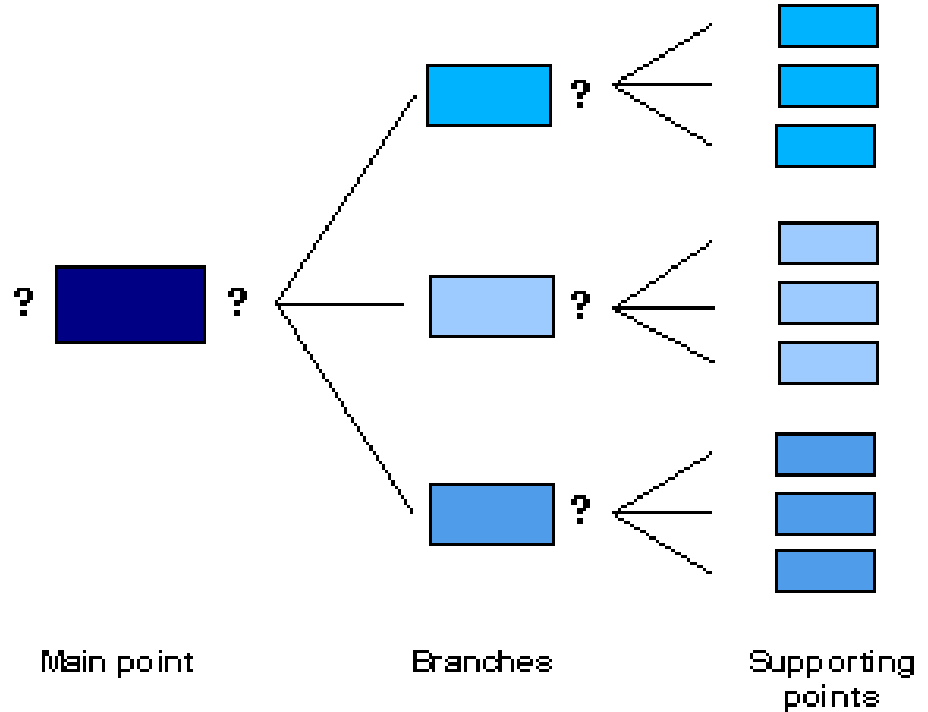
Everything else kept the same



Replication of NS-SEC

Problem: Integrating Soc Codes into calculator

Solution: Create own Soc lookup within app



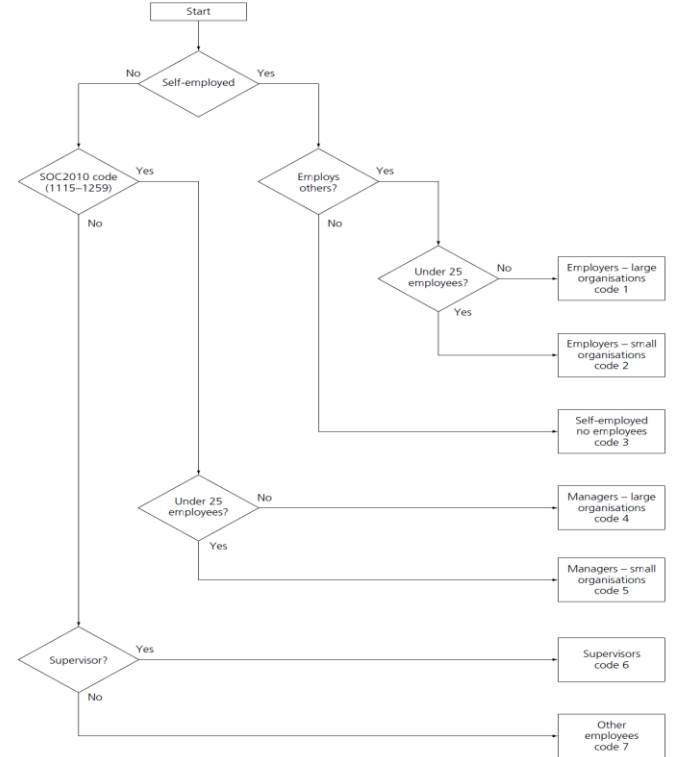


Replication of NS-SEC

All documentation readily available

Inspired by the ONS NS-SEC Coding Tool

Deriving the employment status/size of organisation variable, full method





NS-SEC Schema

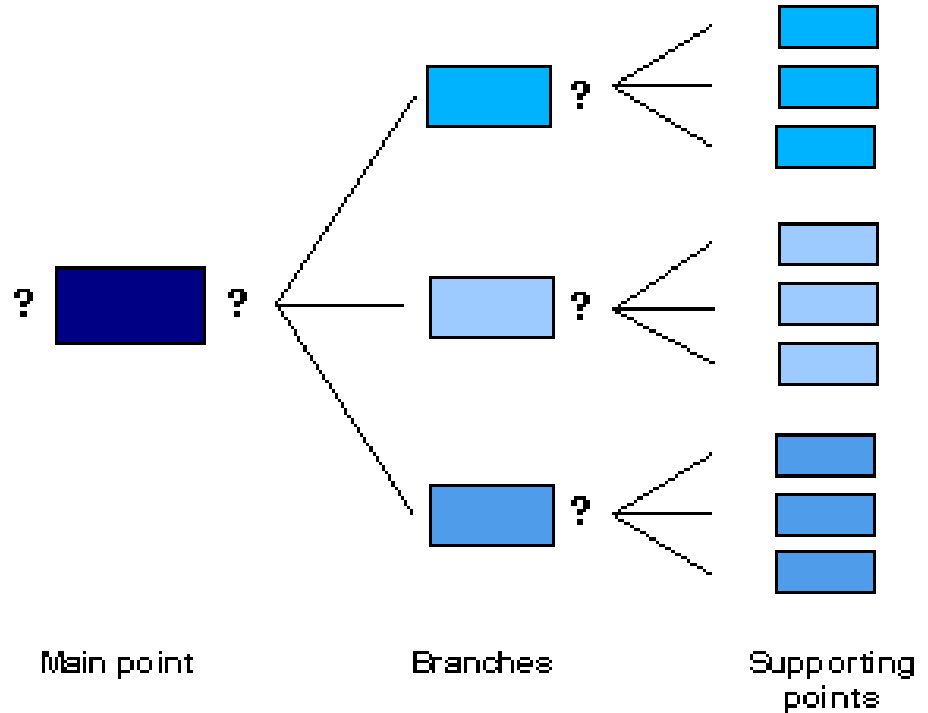
Operational categories		Analytic variables			
		Nine classes	Eight classes	Five classes	Three classes
L1	Employers in large establishments	1.1 Large employers and higher managerial occupations	1 Higher managerial and professional occupations	1 Managerial and professional occupations	1 Managerial and professional occupations
L2	Higher managerial occupations				
L3	Higher professional occupations	1.2 Higher professional occupations			
L4	Lower professional and higher technical occupations				
L5	Lower managerial occupations	2 Lower managerial and professional occupations	2 Lower managerial and professional occupations		
L6	Higher supervisory occupations				
L7	Intermediate occupations	3 Intermediate occupations	3 Intermediate occupations	2 Intermediate occupations	2 Intermediate occupations
L8	Employers in small establishments				
L9	Own account workers	4 Small employers and own account workers	4 Small employers and own account workers	3 Small employers and own account workers	
L10	Lower supervisory occupations				
L11	Lower technical occupations	5 Lower supervisory and technical occupations	5 Lower supervisory and technical occupations	4 Lower supervisory and technical occupations	3 Routine and manual occupations
L12	Semi-routine occupations				
L13	Routine occupations	6 Semi-routine occupations	6 Semi-routine occupations	5 Semi-routine and routine occupations	
L14	Never worked and long-term unemployed				
		7 Routine occupations	7 Routine occupations		
		8 Never worked and long-term unemployed	8 Never worked and long-term unemployed	Never worked and long-term unemployed	Never worked and long-term unemployed



Replication of RGSC and CAMSIS

Problem: Finding matching up-to-date SOC codes

Solution: Paul Lamberts resources...





Replication of RGSC & CAMSIS

All documentation readily available from Lambert's website



RGSC Schema

	Class	Occupations	Example Occupations
Non-Manual	I	Professional Occupations	Accountant
	II	Intermediate Occupations	Police Officer
	IIIN	Skilled Non-Manual Occupations	Clerical Worker
Manual	IIIM	Skilled Manual Occupations	Butcher
	IV	Partly Skilled Occupations	Postal Worker
	V	Unskilled Occupations	Labourer



CAMSIS Schema

- Scale measure of social distance*
- Typically mean of 50 and std. of 15

Replication of original GBCS (2013) analysis

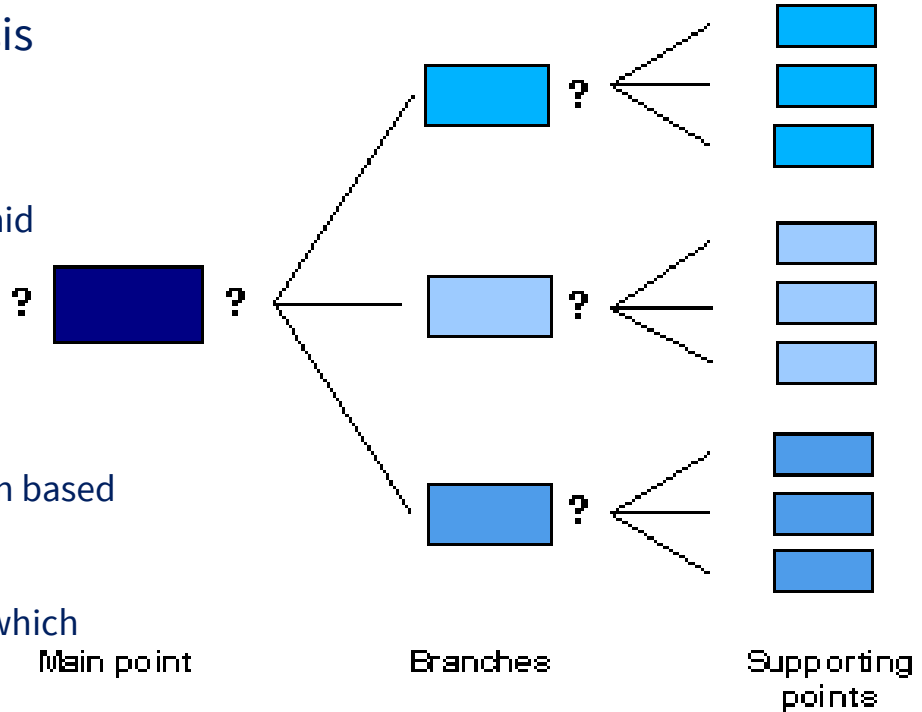
Problem 1: replicating original latent trait analysis

Problem 2: integrating user inputs within shiny into said analysis

Problem 3: running latent trait analysis in a Shiny environment

Problem 4: Displaying a user's individual class location based on maximum probabilities

Problem 5: How to know which classes lined up with which original GBCS classes?





Replication of original GBCS (2013) analysis

Problem 1: replicating original latent trait analysis

Solution 1: Whilst code for analysis isn't readily available, detailed methodological documentation is found within UKDataService data

Latent trait analysis going forward is not identical, but as close as possible



Replication of original GBCS (2013) analysis

Problem 2: integrating user inputs within shiny into said analysis

Solution 2: Simple matter of translating user inputs into a temporary data frame and merging that with original GfK data

This also allowed for appropriate transformation and normalisation of variables following original methodological notes



Replication of original GBCS (2013) analysis

Problem 3: running latent trait analysis in a Shiny environment

Solution 3: Using the tidyLPA package made this rather easy



Replication of original GBCS (2013) analysis

Problem 4: Displaying a user's individual class location based on maximum probabilities

Solution 4: tidyLPA package provides statistics on the probabilities of each individual observation being located in each latent class

The maximum probability was selected for the 1027th observation (user input observation) and the relevant probability was printed alongside the latent class it belonged

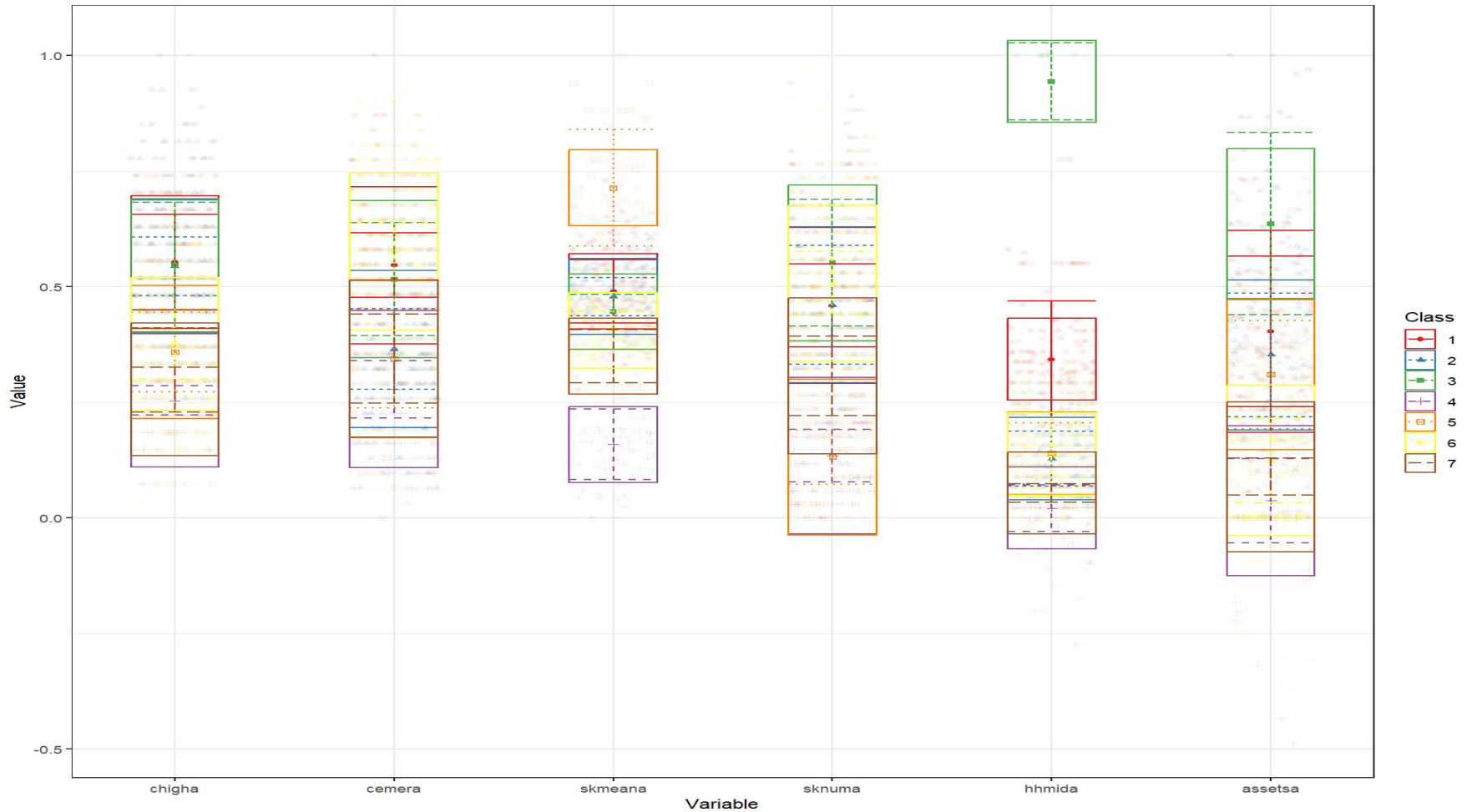


Replication of original GBCS (2013) analysis

Problem 5: How to know which classes lined up with which original GBCS classes?

Solution 4: Use the original 2013 paper in its latent definitions of classes to designate descriptors to current latent classes

This was aided by graphing the latent classes onto the original variables used for latent trait analysis





- Class 1 = New Affluent Worker
- Class 2 = Emergent Service Worker
- Class 3 = Elite
- Class 4 = Precariat
- Class 5 = Traditional Middle Class
- Class 6 = Emergent Service Worker
- Class 7 = Traditional Working Class

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End Result:

Class Calculator Class Schemas GBCS Wright Simplified NS-SEC CAMSIS RGSC GBCSR Wright Full Your Result About

Schema Selector

- Great British Class Survey
- Neo-Marxian Simplified
- NS-SEC
- CAMSIS
- RGSC
- GBCSR
- Wright Full



How to use the Class Calculator?

Select which class schema you wish to view and undertake using the designated sliders. There is a brief description of each schema below to aid in your decisions. After you have selected the desired schemas simply use the top banner to select the schema you wish to complete first. Go through all questions on each page until you reach the bottom of the page with no questions remaining. After you have done this, simply scroll to the top of the page and move on to the next class schema. If you have no class schemas left to select, simply click on the results page. Some class schemas may take a few seconds to calculate your results. Simply wait until the results are displayed. Each schema will present users with their class result, and a brief description of their given result. For more detailed descriptions of each individual schema follow the respective references that are hosted and linked on this page. For any errors/issues/queries please see the about us page or contact the owners directly at: soatley@ed.ac.uk

What do each of these schemas mean?

What is the Great British Class Survey?

The Great British Class Schema is in part a response to traditional conceptualisations of social class that do not effectively capture the role of social and cultural processes in generating class divisions (Savage et al 2013). The GBCS derives seven classes that are indicative of combined social, cultural, and economic capital.

What is the Neo-Marxian Simplified Schema?

Erik Olin Wright's model of social stratification comes through an attempt to demonstrate social classes capacity to reveal the underlying dynamics of social processes of exploitation (Wright 1979). Unlike Weberian concepts of class, Wright's schema goes beyond the conceptual argument.

What is the NS-SEC Schema?

The National Statistics Socio-economic classification (NS-SEC) and seeks to measure the employment relations and conditions of occupations (Williams 2017). It is the official socio-economic classification in the United Kingdom.

What is CAMSIS?

The CAMSIS project is an internationally comparative assessment of the structures of social interaction and stratification across a number of countries. At its core lies the construction - and dissemination - of occupational scales for each constituent country. The scale values represent an occupational unit's relative position within the national order of social interaction and stratification. (Lambert 2018).

What is the RGSC Schema?

An official scheme of class analysis used in British surveys and censuses for much of the 20th century. Was eventually dropped in favour of NS-SEC for official statistics. (Rose 1995).

What is the GBCSR Schema?

This is an attempt to replicate the original GBCS as presented in the 2013 paper. This schema uses user inputs that are identical to that of the original 2013 GBCS. The GFK survey data contains 1026 observations, using the original methodology notebooks provided, a latent trait analysis is run in the background after a user hits 'submit', this includes the user data alongside the original GFK data and produces a maximum probability statistic for the users class.

What is the Wright Full Schema?

This is the full and 'pure' conceptualisation of the 'Neo-Marxian Simplified' Schema derived from Erik Olin Wright. This schema has more questions than the simplified version but there is no difference in the results. The scale is constructed from measures of similarity and difference between occupations, as reflected in the typical interaction patterns of their incumbents. Measures of social distance include friendship choices and inter-marriage.

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Trial Run Example (me)

Social Class Schema	Result	Description
GBCS (BBC)	Precariat	This is the poorest and most deprived class group. People in this group score low for economic, social and cultural factors.
NS-SEC	Higher professional occupations	Positions, whether occupied by employers, the self-employed or employees, that cover all types of higher professional work.
RGSC	Professional Occupations	Near top of non-manual hierarchy.
CAMSIS	77.36	greater than average compared to the rest of the population
Wright (Simplified)	Expert Non-Managers	Does not own sufficient capital, has low organisational assets and high skill/credential assets.
Wright (Full)	Expert Non-Managers	Does not own sufficient capital, has low organisational assets and high skill/credential assets.
GBCS (2013)	Class: 6 (Emergent Service Worker), Probability: 0.83693615607348	Moderately poor economic capital, though with reasonable household income, moderate social contacts, high emerging (but low highbrow) cultural capital



Reproducing was step one

- Two issues still needed to be addressed:
 - Being used as a teaching tool
 - Being able to be replicated, manipulated, and used by others



Teaching Tool

- Need a way to host the app in a way that academics and students alike can use it
- Shinyapps.io
 - Free
 - No unwanted data collection
 - HOWEVER: Latent Trait Analysis does not work well with Shinyapps (low GB allowance)



Open Source

- Need a way to host the code
- Github: <https://github.com/EOSSCC/Class-Calculator>
 - Each class schema is isolated within its own function
 - Hosted outside the UI/master file
 - Enables recoding, removal and addition of academics schemas of choice



Any Questions?

- Desire to turn this into a paper – advice very welcome