

HIS-CAM - Presentation and evaluation of an historical occupational stratification scale based upon the analysis of social interaction

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Social interaction and social stratification

1) Long observed link between social interaction patterns and social stratification

- *[Weber; Bourdieu 1984; Bottero 2003]*
- *[Blau and Duncan 1967; McPherson et al 1999; Kalmijn 1998]*

2) Analysis of social interaction patterns can be used to tell us about structures of social stratification

- ‘Cambridge scale’ and CAMSIS: *[Stewart et al 1980; Prandy 1990; Prandy and Lambert 2003]*
- *[Lauman 1966; Bakker 1993; Chan and Goldthorpe 2004]*

CAMSIS, www.camsis.stir.ac.uk

Lays out a methodology for analysing social interaction for the purpose of social stratification research

- Analyse pairs of occupations linked by a social interaction (marriage; friendship; inter- and intra-generational connections)
- Use correspondence analysis (SPSS; Stata) or RC-II association models (Stata; IEM) on pairs of occupations
- *Tradition of 'specificity': makes an empirical calculation within a 'context' (country; time period)*

Husband's Job Units

Occ Units ↓ →		Husband's Job Units				
		1	2	..	407	
<i>Derived scores ↓ →</i>		75.0	70.0	..	10.0	
Wife's Job Units	1	72.0	30	15	..	0
	2	72.5	13	170	..	1

	407	11.0	0	2	..	80

- *Derived scores predict frequency of interactions (#cases per cell)*
- The scales describe one or more dimensions of a **structure of social interaction...**
 - ...this turns out to also represent a **structure of social stratification...**
 - ...resulting in scale scores which measure an occupation's relative position within the structure of stratification.

Occupations and social structure in history (1800-1938)

- *‘Starting from the occupational titles themselves’*
[HISCO – van Leeuwen, Maas & Miles, 2002, p28]
- *‘The historical process does of course influence the relative social position of the different groups’* [Thomsen, 2008 – today!]
- Relatively easy to access data on occupations linked through social interactions: inter-generational occupational links from marriage registers etc

HIS-CAM scales can offer

- **Summary measure of occupational positions**
 - Differentiates finer occupational details
 - *Typically 300+ occupational units assigned different scores*
 - Emphasises a hierarchical structure of inequality
 - *Measures relative advantages typically associated with incumbents of an occupational position*
- **Explorative device for understanding occupations**
 - Measure multiple relative structures of stratification between countries, time periods, gender based groups..?

Data used in HIS-CAM

	1800-1938	1800-90	1891-1938
	<i># child-parent data points (% male-male)</i>		
Netherlands*	664311 (47)	412732 (39)	251579 (61)
Germany⁺	7710 (97)	5499 (99)	2211 (86)
France*	65308 (45)	40931 (47)	24377 (44)
Sweden*	19166 (75)	18079 (74)	1087 (88)
UK*⁺	45517 (78)	28848 (82)	16669 (72)
Canada (Quebec)*	229134 (98)	91680 (99)	137454 (98)
US[#]	194218 (43)	56310 (20)	137908 (53)
Belgium*	48437 (53)	40320 (54)	8117 (49)
<i>*Marriage/parish registers; ⁺Genealogical; [#]Census</i>			

HIS-CAM in summary

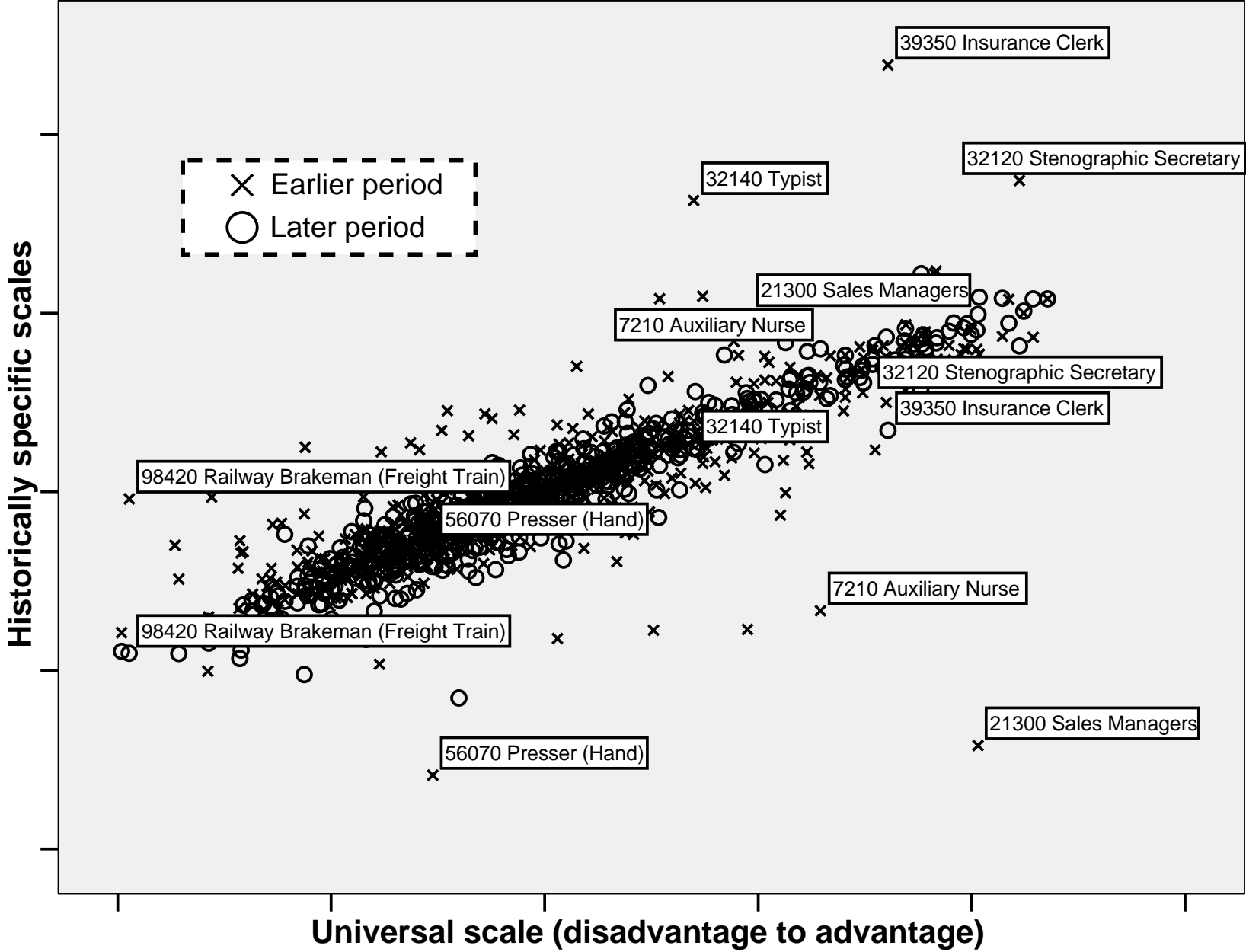
- **Version 0.1** (www.camsis.stir.ac.uk/hiscam/, May 2006)
 - Netherlands, Germany, France, Sweden, UK, Canada
 - *Occupational coding to HISCO standardised across countries*
 - One cross-national scale; 6 national scales (specific), for 1800-1938; scales for 'early' and 'late' periods (c1890)
- **Version 0.2** (February 2008)
 - *Experimental review producing a great many alternative scales*
 - (combinations of countries*time periods*gender groups)
 - Improved micro-data on 6 core countries (extended coding quality review; increased volume of cases); new data US & Belgium
 - *Occupational coding at localised levels*
 - *Automatic scale derivations*
- **Version 1.0** (Spring 2008)
 - 11 scales for public release
 - *..See conclusions..*

HIS-CAM scales prove to have very similar properties to contemporary CAMSIS scales

- Clearly reflect an order of stratification advantage / disadvantage in occupations
 - Jobs with educational requirements tend to be highest ranked (Univ. professors)
 - Low skilled labouring jobs tend to be lowest ranked
 - Correlate around 0.7 with prestige scales, class schemes
- Some plausible differences between (some) different specific scales
 - Agricultural jobs show most variation in relative positions between countries
 - Service sector jobs change positions over period

Version 0.1:

Universal to Historical-specific scale scores, HISCO unit groups



End point at v0.1

- Combining sparse HISCO unit groups in the same way across countries is problematic
- Universality or specificity
 - (how many scales should there be?)
 - Statistical support for maximum specificity
 - But broad correlations between schemes

Version 0.2: Permutations of occupations

C	10 national groupings (<i>8 countries, plus all countries, plus all countries excl. US</i>)
L	5 levels of occupational detail (<i>major groups, 1-digit, 2-digit, 3-digit, 5 digit</i>)
S	4 gender groupings (<i>all occupations combined; male occupations only; female occs based on daughter-father; female occs based on daughter-mother</i>)
T	5 time periods (<i>whole period; pre- and post- 1891; pre- and post national specific point of transition in agriculture/manufacturing balance</i>)
$10*5*4*5 = 1000$ different v0.2 HIS-CAM scales - In practice, 825 scales were calculated (Feb 2008)	

Approaching maximum specificity

- Combination of small occupational groups on each of the 825 samples is substantially different
 - *(in v0.1, this was ignored by using common coding in a nested model framework)*
- Ideally, national experts in occupational coding and statistical modelling would review coding and categorisations and optimise statistical models
 - [=>relatively few contemporary CAMSIS scales...]*

SPSS Pivot Table - table1

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	Netherlands				Sweden			
	Child and parent male		Child female, parent male		Child and parent male		Child female, parent male	
	child	parent	child	parent	child	parent	child	parent
1110 Chemist, General	54	7			2			
1200 Physicists	3	2						
1210 Physicist, General	3							
1340 Meteorological Scientist		1						
1400 Physical Science Technicians, Specialisatin Unknown	35	16			1			
2000 Engineer, Specialisation Unknown	220	43			6	3		1
2120 Building Architect	104	102			9	1		
2130 Town Planner	5	8			1			
2140 Landscape Architect	1	2						
2210 Civil Engineer, General	213	77			4	1		
2220 Building Construction Engineer	40	32			5			
2230 Highway and Street Construction Engineer	3	4						
2240 Railway Construction Engineer	4	1				3		
2255 Hydraulics Engineer	54	62			8			
2290 Other Civil Engineers	48	32			1			
2305 Electrical Engineer, General	1							
2310 Electronics Engineer, General	2	1						
2410 Mechanical Engineer, General	14	4			1	1		
2450 Ship Construction Engineer						2	5	1
2510 Chemical Engineer, General	13	1			1			
2620 Extractive Metallurgist	2							
2710 Mining Engineer, General	4	1						
2930 Agricultural Engineer	3							
3020 Land Supervisor	127	98			20	14	14	

v0.2 strategies

- Automated recoding of sparse occupations
 - (to popular or generic subgroup codes)
- Standard model selection criteria
 - (2 dimensional correspondence analysis and limited additional treatments for over-influential cases)
- *The whole process can be automated using Stata (correspondence analysis)*
 - *825 automatically derived scales now exist*
 - *What on earth to do with them..?*

Example 1: A well-identified automatic scale

<i>l1_c3_s2_t1 = 1-digit, France, Male-Male, whole time period</i>		
		CA percent inertia:
0 Professionals	85.4	<u>Dim 1=59.0%</u> ; Dim2=36.5%
1 Professionals	71.0	<i>Correlation with:</i>
2 Administrative / managerial	73.1	ISEI = 0.73 (<i>no farm=0.75</i>)
3 Clerical and related	59.3	Treiman= 0.62 (<i>no farm=0.88</i>)
4 Sales workers	61.8	
5 Service workers	47.6	<i>Father-son correlation:</i>
6 Agricultural	46.4	0.27
7 Production, transport, labour	46.5	(0.30 ISEI; 0.17 Treiman)
8 Production, transport, labour	48.4	
9 Production, transport, labour	45.6	

Example 2: A well-identified automatic scale

<i>15_c1_s1_t1 = 5-digit, Netherland, all, whole time period</i>		
		CA percent inertia:
13130 University teachers	99	<u>Dim 1=11.8%</u> ; Dim2=8.1%
13320 First level teacher	68.9	<i>Correlation with:</i>
61240 Livestock farmer	47.4	ISEI = 0.81 (<i>no farm=0.78</i>)
62105 Farm worker	39.2	Treiman= 0.70 (<i>no farm=0.78</i>)
79420 Garment pattern maker	60.1	
79510 Hand or machine sewer	50.6	<i>Father-son correlation:</i>
83920 Gunsmith	55.6	0.45
83930 Locksmith	52.6	(0.31 ISEI; 0.12 Treiman)
84230 Precision instrument maker	62.4	
99920 Day Labourer	43.1	

Practical and empirical problems with automatic scales:

Correlations..	ISEI	Treiman
c0_s2_t1 (all countries)	0.65	0.68
c1_s2_t1 (Neth)	0.86	0.86
c2_s2_t1 (Germ.)	0.64	0.61
c3_s2_t1 (France)	0.86	0.83
c4_s2_t1 (Sweden)	0.55	0.47
c5_s2_t1 (Britain)	0.79	0.77
c6_s2_t1 (Canada)	0.77	0.81
c7_s2_t1 (USA)	-0.06	0.01
c8_s2_t1 (Belgium)	0.43	0.38
c9_s2_t1 (all, excl. US)	0.74	0.75
<i>S2=male-male only; t1=1800-1938; level: 5-digit HISCO</i>		

Summary on v0.2

- V0.2 helps us to evaluate the scale-construction procedure
- Some v0.2 examples show persuasive evidence of specificity (not previously visible in v0.1)

But some problems..

- i. Automation produces more results than can easily be reviewed
- ii. Automation produces many poor results (?50%)
 - Model estimates not subject to expert review (detecting and highlighting appropriate dimensions)
 - Automated recoding still misses country differences
- iii. **Users of scales probably don't want 825 alternatives..!**

Version 1.0

- There is statistical and substantive evidence for both specificity and for universality
- There are practical limitations to too much specificity
- *Persuaded by a strategy of 'realistic complexity'*

Version 1.0

- Publication of a small number of specific scales (based on key patterns from v0.1 and v0.2)
 - 1 cross-national
 - 8 national specific
 - 1 cross-national pre-1890; 1 cross-national post 1891
- Options for further analyses (using national expertise)

Appendix: how to use HIS-CAM

- Selected scales at www.camsis.stir.ac.uk/hiscam
 - Released versions can also be accessed at www.geode.stir.ac.uk
 - Data manipulation tasks:
 - Match files in SPSS, Stata or plain text
 - Recode macros in SPSS, Stata
- 1) Use as a measure**
- Interpretation: the relative position typically held by incumbents of the occupational group within the structure of social stratification [*...for context – year, country etc*]
 - *Social mobility analysis: no, it's not circular*
- 2) Use as information about occupations**
- New data on relative positions of occupational units