

Application: Using SID to analyse occupational structure in the past

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www.camsis.stir.ac.uk/sonocs

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1)	Some background on 'HISCAM'
2)	Recent progress in 'SONOCS'

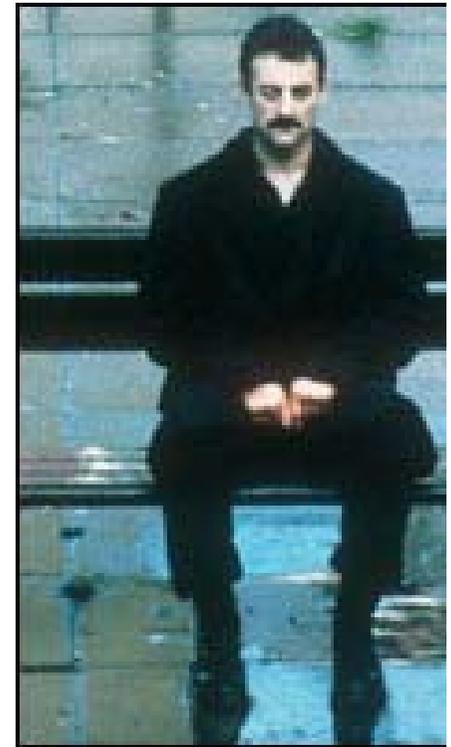
Motivation

- Studying social interactions and social connections can help us to understand social trends and transformations
 - Social mobility; homogamy; industrialisation; etc
- Taking full advantage of historical occupational codes, new data, and new analytical opportunities
 - HISCO/NAPPHISCO/Microclass standardised codes...
 - ...capture fine-grained details, but potentially aggregate some occupations by sector rather than level

Social inequality...

Social inequality & social stratification

- Material measures (income, housing, ...)
- **Occupations**
 - Sociological evaluations consistently find occupations (of current, past, or family) to be the most revealing indicators of enduring social position (cf. Sayer 2011; Jonsson et al. 2009; Kurtz 2009)



'Gissa job'; 'I can do that'

“Nothing stamps a man as much as his occupation. Daily work determines the mode of life.. It constrains our ideas, feelings and tastes” (Goblot, 1961)

Citation of Goblot as highlighted by Coxon & Jones (1978)

Image from http://www.bbc.co.uk/liverpool/content/articles/2007/10/09/boys_from_the_blackstuff_feature.shtml

Data on occupations and personal networks is abundant...

Finally, in this section I have a few questions about your friends.

47. First of all can you think of the people with whom you are most friendly. I am interested in their occupations. Will you think of one of them and give me his occupation?

Is he a relative?

Is he a workmate?

Can you give me the occupation of another?

and so on until respondent has given four friends

38-41

1.

Male	Actual	1	Male Terminal	2	Relative	1	Workmate	1	Close Friend See Q. 48, 50
Female		3	Female	4	not	0	not	0	1st = 1 2nd = 2 neither = 0
→ Sub									
Occupation									
Type of Employer									

42-6

47-50

2.

Male	Actual	1	Male Terminal	2	Relative	1	Workmate	1	Close Friend See Q. 48, 50
Female		3	Female	4	not	0	not	0	
→ Job									
Occupation									

51-5

Social
Status in
Great
Britain
(1974)

CAMISIS, www.camsis.stir.ac.uk

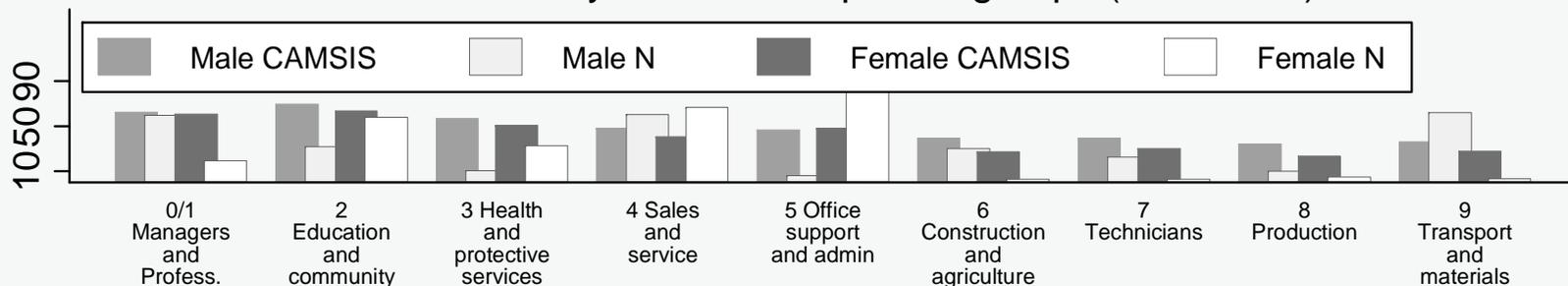
Lays out a methodology for analysing social interaction for the purpose of social stratification research

- 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)*
- Many other writers are using association models/correspondence analysis for similar structural analytical purposes (e.g. Chan 2010; Bakker 1993; Laumann and Guttman 1966)

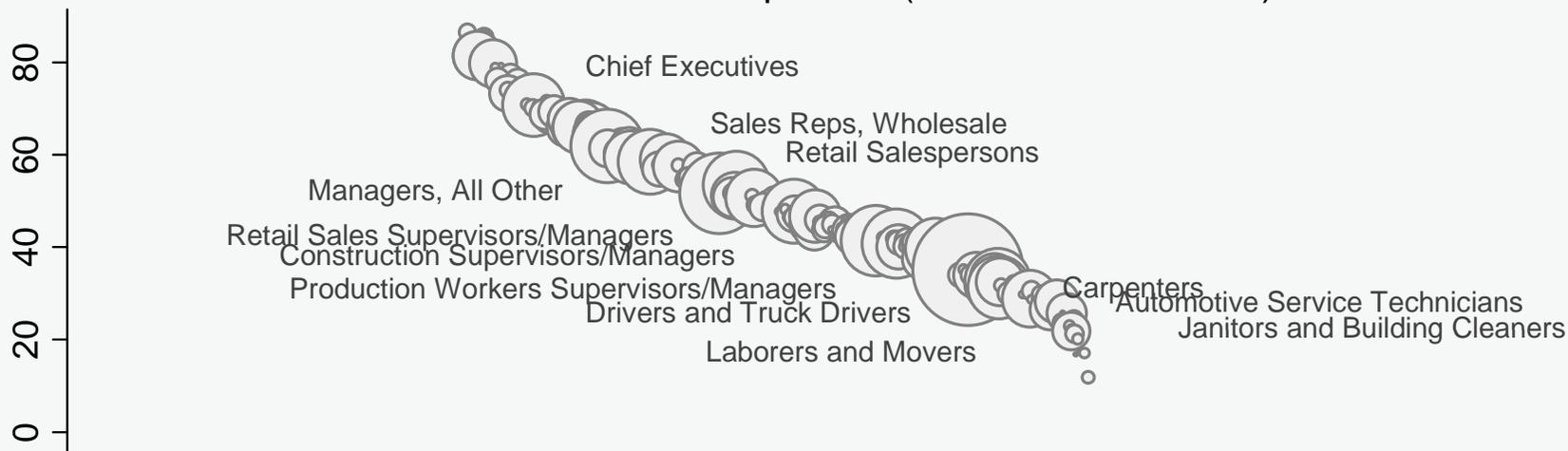
Figure 1: Illustration of SID scales

USA, 2000

CAMSIS scores by broad occupational groups (USA 2000)



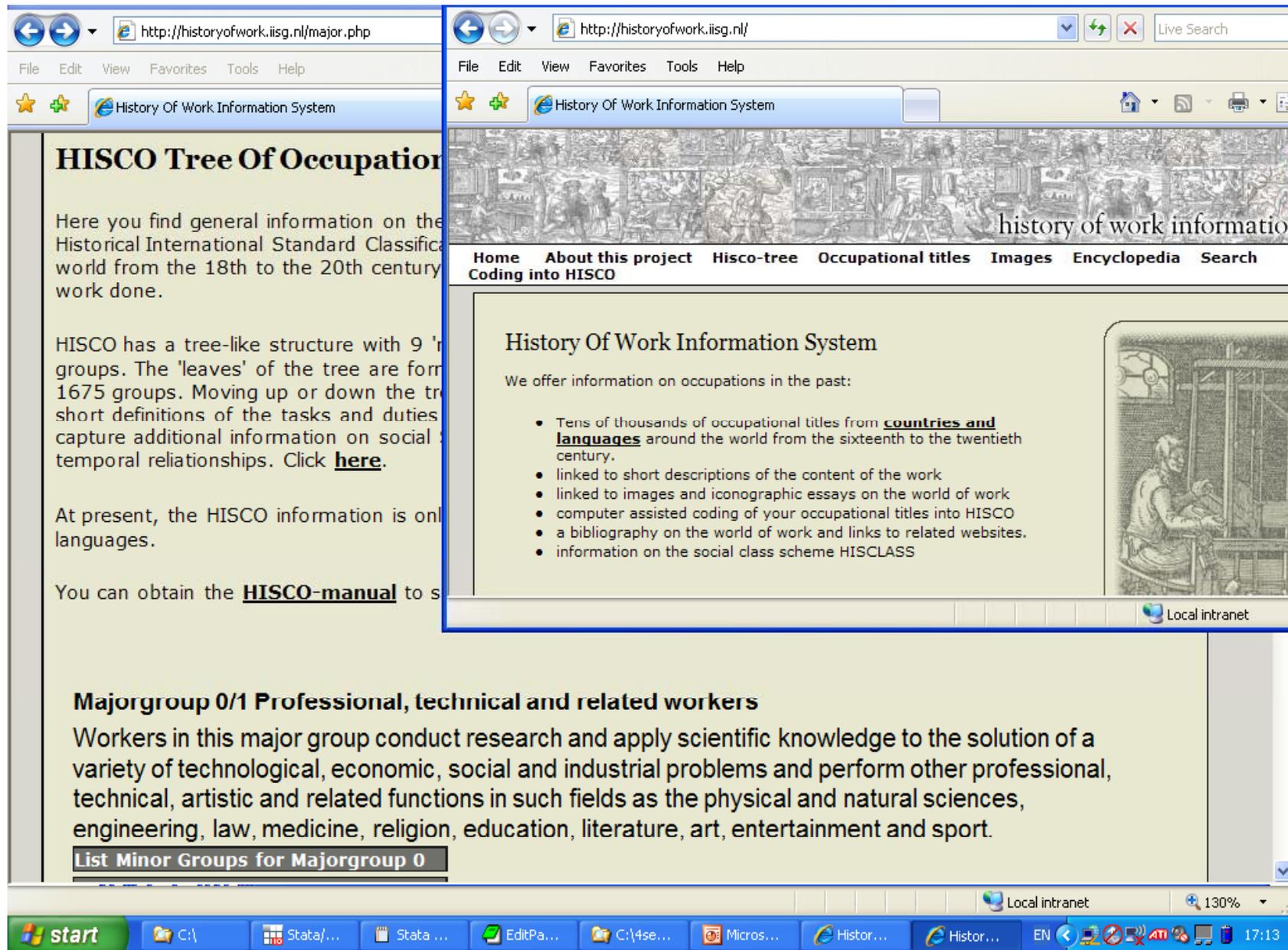
CAMSIS scores for 475 occupations (male CAMSIS scale)



Source: IPUMS USA, 3% sample, and www.camsis.stir.ac.uk

Panel 1: Occupational groups are first digit of US SOC2000. N is sample N / 3,000,000.

Panel 2: Marker size is proportional to number in occupation. Labels show 15 most common occupations.



- **HISCO** (van Leeuwen et al. 2002) [*Close to ISCO-68*]
- **Bespoke national schemes** (e.g. Prandy and Bottero 2000; Miles 1999)

HIS-CAM (Historical CAMSIS) scales

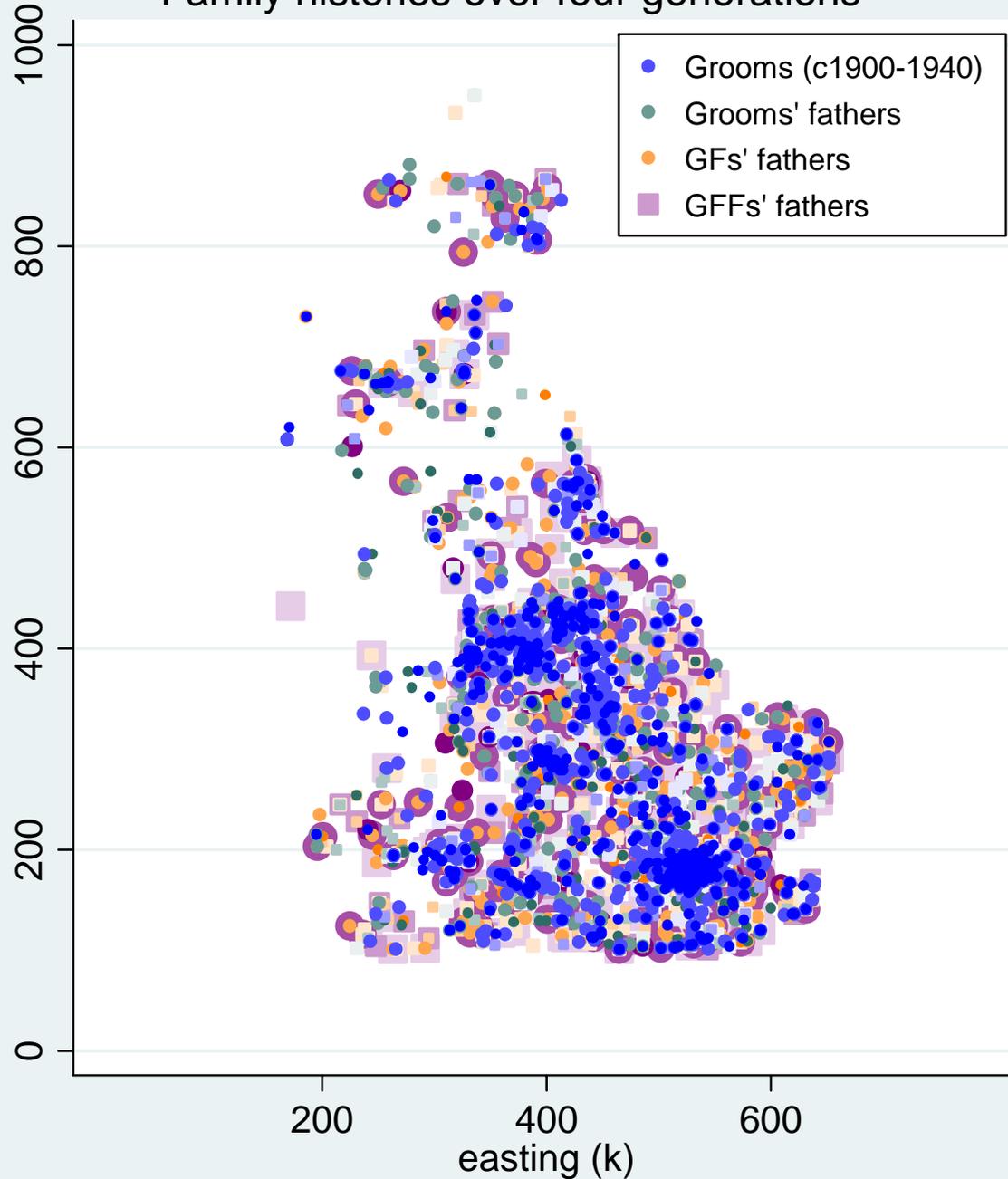
- **Summary measure of HISCO occupational positions**
 - Differentiates finer occupational details
 - *Typically 300+ occupational units assigned different scores*
 - Emphasises a hierarchical structure of inequality
 - ***An instrumental measure (of the relative advantage typically associated with incumbents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

Lambert, P. S., Zijdeman, R. L., Maas, I., van Leeuwen, M. H. D., & Prandy, K. (2012). The construction of HISCAM: A stratification scale based on social interactions for historical research. *Historical Methods*, forthcoming.

Data used in HIS-CAM (v1.1)

	1800-1938	1800-90nd	1891-1938nd
	<i># child-parent data points (% male-male)</i>		
Netherlands*	1123026 (50)	457442 (39)	262707 (62)
Germany⁺	12724 (97)	5567 (99)	2229 (86)
France*	115044 (48)	43526 (47)	29098 (44)
Sweden* (1800-1921)	41379 (83)	28743 (66)	1271 (84)
UK*⁺	61884 (83)	29512 (82)	16899 (72)
Canada (Quebec)*	564841 (98)	98449 (97)	147044 (94)
US[#] (1850-1930)	194218 (43)	56310 (20)	137908 (53)
Belgium* (1800-1900)	86227 (66)	42141 (55)	8472 (50)
<i>*Marriage/parish registers; ⁺Genealogical; [#]Census; nd=non-diagonal pairs only</i>			

Family histories over four generations



The UK 'Family History Study'
[Prandy and Bottero 2000]

Source: 2899 marriages c1900-1950, Family History Study (Prandy and Bottero, 2000)
Shading intensity / symbols reflect HISCAM scale.
Geographic identifiers for location at time of marriage or child birth

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

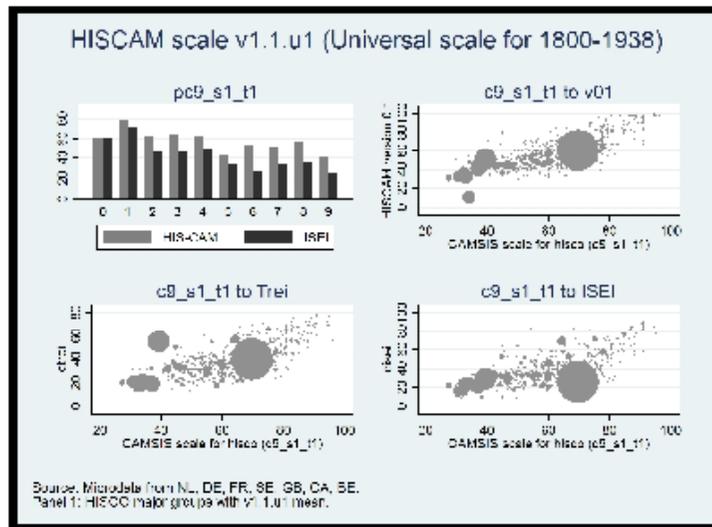
- Clearly reflect an order of stratification advantage / disadvantage in occupations
 - Jobs with educational requirements tend to be highest ranked (Univ. professors)
 - Low skilled labouring jobs tend to be lowest ranked
 - Correlate around 0.7+ with prestige scales, class schemes
- Some plausible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

(www.camsis.stir.ac.uk/hiscam)



HIS-CAM: Estimating social interaction and stratification scales for the 19th and 20th century

Update: 18 October 2009 - v1.1 HISCAM scales released



CAMSIS: HIS-CAM project - Windows Internet Explorer

http://www.camsis.stir.ac.uk/hiscam/

Download our scales!

HIS-CAM VERSION 1.1 (OCTOBER 2009)

Version	Stata	SPSS
<i>Universal scales</i> (derived from data from multiple countries)		
U1: Male and female, 1800-1938	.dta	.sav
U2: Male only, 1800-1938	.dta	.sav
U3: Female only, 1800-1938	.dta	.sav
E: Early period, 1800-c1890	.dta	.sav
L: Later period, c1890-1938	.dta	.sav
<i>National scales</i> (derived from data for a single country, mainly from the 19th century)		
NL: Netherlands	.dta	.sav
DE: Germany	.dta	.sav
FR: France	.dta	.sav
SE: Sweden	.dta	.sav
GB: Britain	.dta	.sav
CA: Canada	.dta	.sav
BE: Belgium	.dta	.sav

http://www.camsis.stir.ac.uk/hiscam/v1_1/hiscam_u1.dta

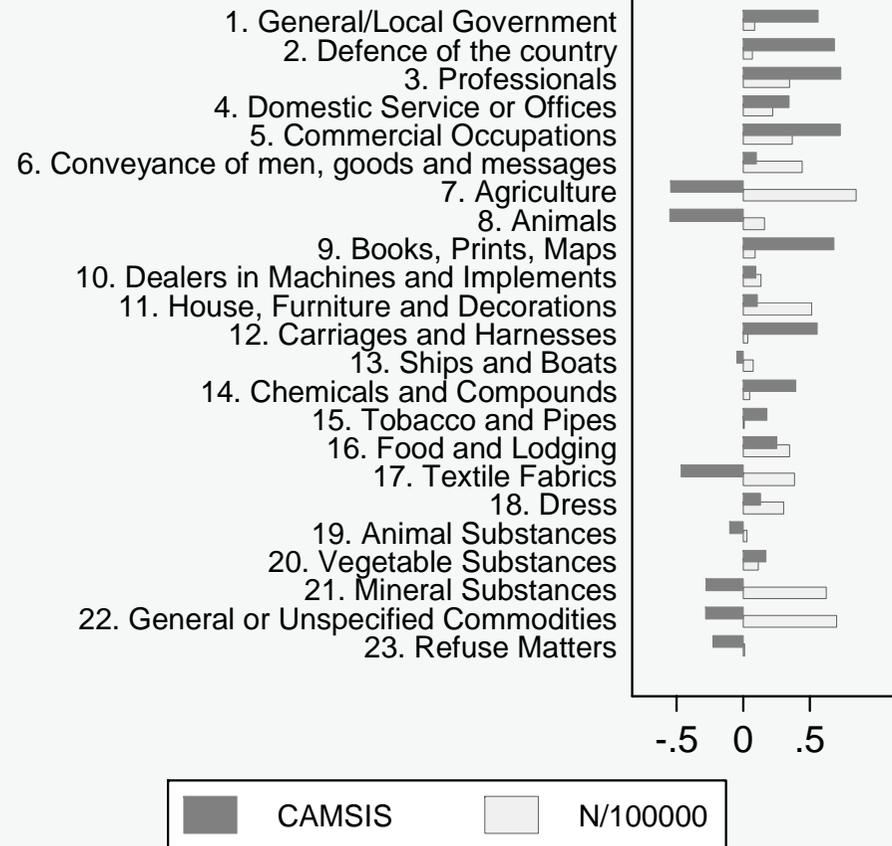
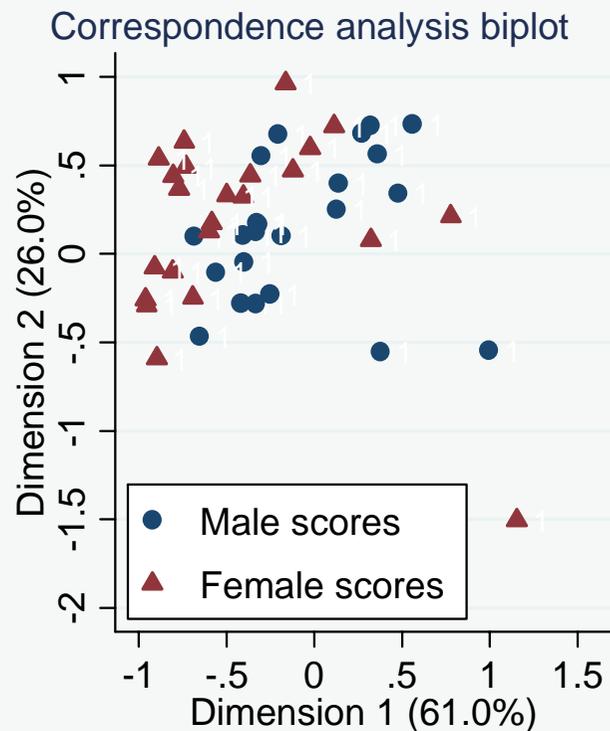
Summary:



In the SONOCS project (www.camsis.stir.ac.uk/sonocs), we are continuing to use SID analyses on large-scale historical datasets

Scotland, 1881

CAMSIS scores by broad occupational groups



Source: NAPP, N=598000 (Intra-household male-female occupational combinations).
 Panel 1: Dimension scores from correspondence analysis of intra-household occupations
 Panel 2: Mean scores for males by 'occupational order'.

What's new?

1) Data resources

- Census returns with household sharers' occupations *as proxy for social distance*

2) Occupational coding

Originally in NAPP/PUMS codes
(**NAPPHISCO**, or **national unit**)

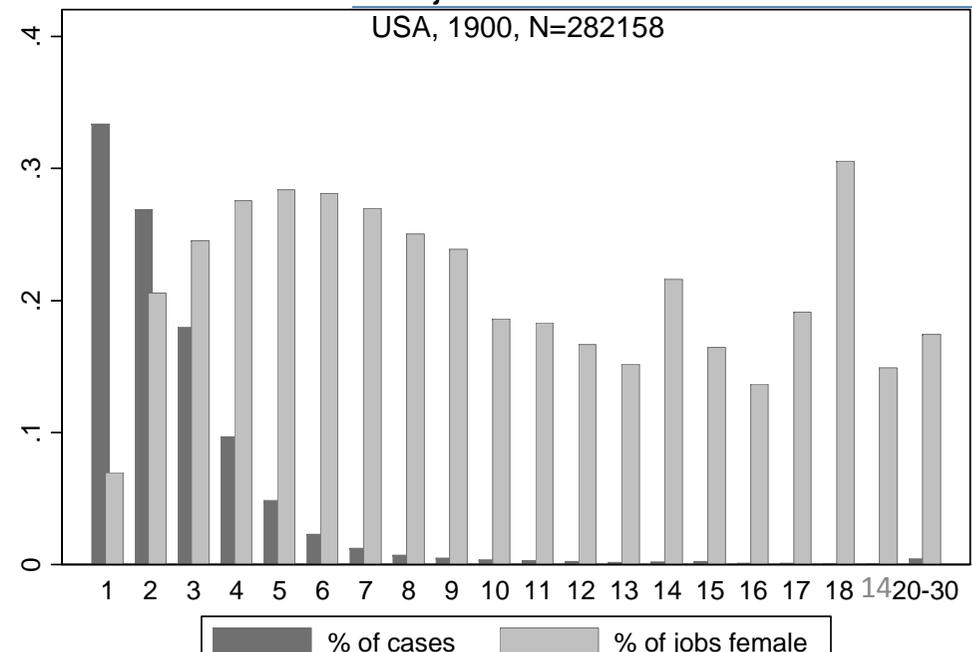
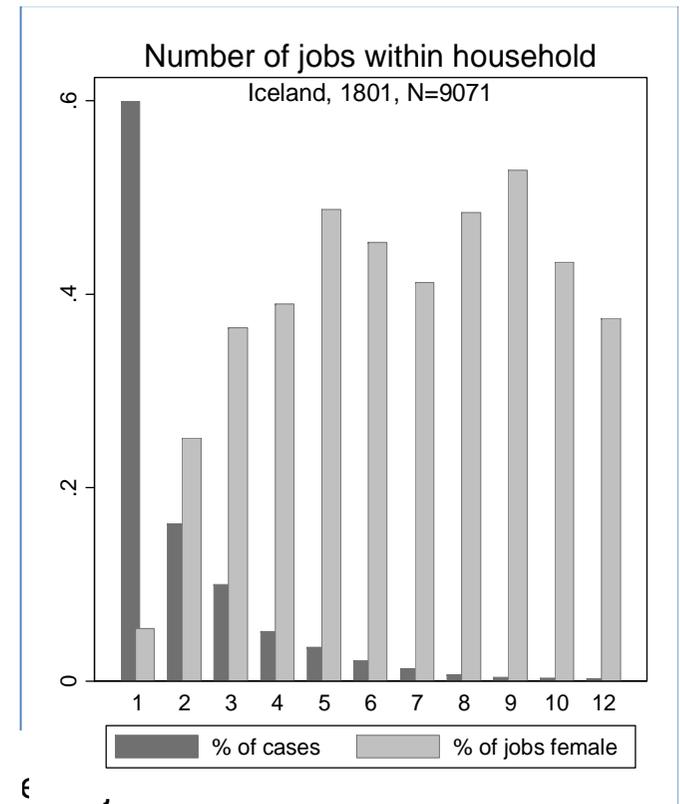
(Approximate) recode into **HISCO**

R Zijdeman; www.geode.stir.ac.uk

(Approximate) recode into 'Microclass'

D Griffiths; www.geode.stir.ac.uk

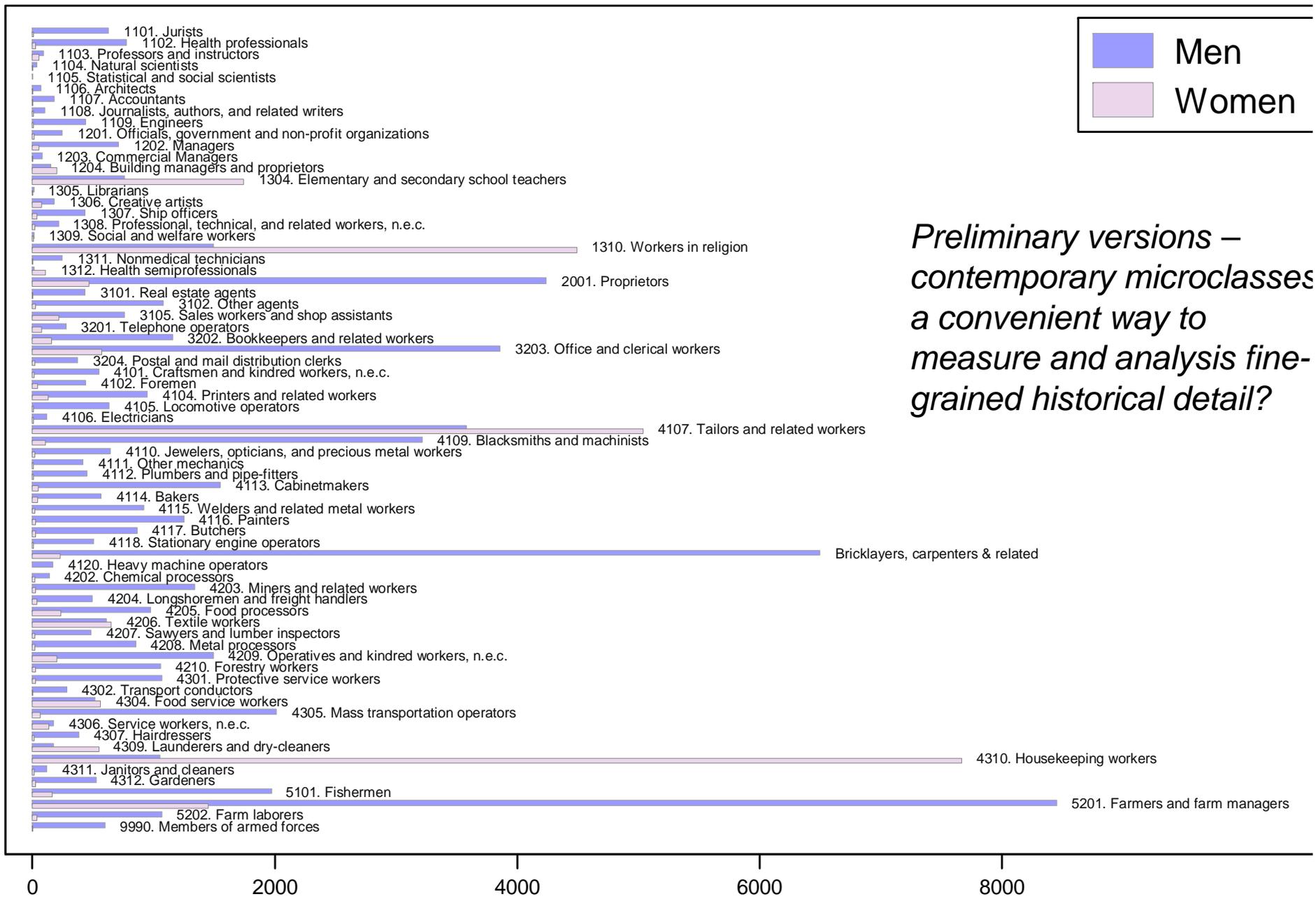
'**Microclass**' (Weeden and Grusky 2005; Jonsson et al. 2009) – socially defined fine-grained occupational clusters



Data sources

Country	Years	N cases (k)	Source	Occupations	Derived Occs
Canada	1871, 1881, 1891, 1901	8; 1276; 156; 92	NAPP	NAPPHISCO	HISCO; Microclass
Iceland	1801, 1901	9; 34	NAPP	NAPPHISCO	HISCO; Microclass
Sweden	1900	1573	NAPP	NAPPHISCO	HISCO; Microclass
Britain	1851; 1881s; 1881ew	214; 2096; 13500;	NAPP	OCCGB	Microclass
USA	1850, 1860, 1870, 1880, 1900	53; 83; 121; 170, 282	PUMS	US1880	HISCO; Microclass
Norway	1801, 1865, 1875,1900	228; 633; 286; 1037	NAPP	NAPPHISCO	HISCO; Microclass

N refers to number of adults in dataset with valid occupational records. The number of unique within household connections between these adults is usually between 1 and 2 times the number of adults.



*Preliminary versions –
contemporary microclasses
a convenient way to
measure and analysis fine-
grained historical detail?*

Canada 1891, Males and females by microclass units. (5201/5201 downweighted by factor of 5).¹⁶

Sample	Model	CAM/USC	Microclass	HISCO	NAPPHISCO (OCCGB)
CA 1871	R2 in predicting	0.155	0.247	0.270	0.303
CA 1881	alter's HISCAM	0.194	0.279	0.309	0.310
CA 1891		0.299	0.404	0.433	0.437
CA 1901		0.143	0.252	0.280	0.283
IC 1801	R2 in predicting	0.060	0.137	0.166	0.167
IC 1901	alter's HISCAM	0.009	0.032	0.043	0.043
SE 1900	``	0.000	0.167	0.192	0.192
GB 1851	R2 in predicting	0.300	0.319	n/a	0.344
GB 1881 (EW)	alter's CAMSIS	0.236	0.258	n/a	0.282
GB 1881 (S)		0.189	0.228	n/a	0.245
US 1850	R2 in predicting	0.027	0.053	0.057	0.058
US 1860	alter's literacy	0.026	0.059	0.065	0.066
US 1870	(plus father's hiscam	0.067	0.145	0.151	0.151
US 1880	if literacy missing)	0.040	0.099	0.103	0.104
US 1900		0.032	0.069	0.075	0.076
NO 1801	R2 in predicting	0.067	0.115	0.156	0.157
NO 1865	alter's HISCAM	0.028	0.064	0.081	0.081
NO 1875		0.057	0.099	0.116	0.117
NO 1900		0.084	0.162	0.180	0.181

What's new?

3) Methods for analysing {within-household} social connections on large-scale and fine-grained data

...Focus on the individual outcome..

- Model with occupation-based indicators
(plus random or fixed effects)

...Focus on the social connection..

➤ Association models

- HISCAM (Lambert et al. 2012)
- Chan (2010) on 'status' scales

Characterise dimensions to
the occupational
interaction structure

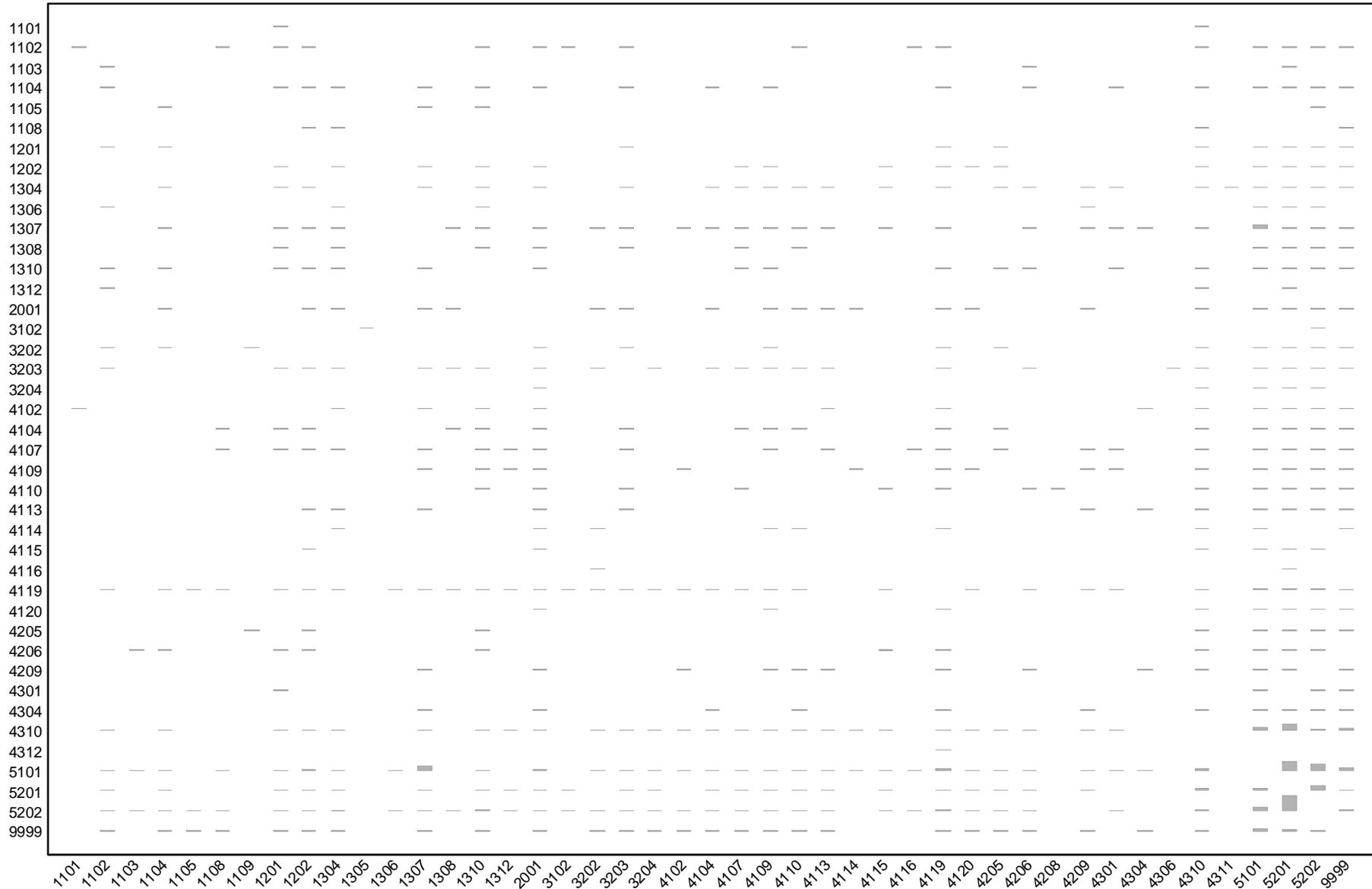
➤ Network analysis

- 'SONOCS' (Griffiths & Lambert 2011)
- Cf. Wellman & Berkowitz (1988)

Identify particular
'routes' of
occupational
connects

Microclasses

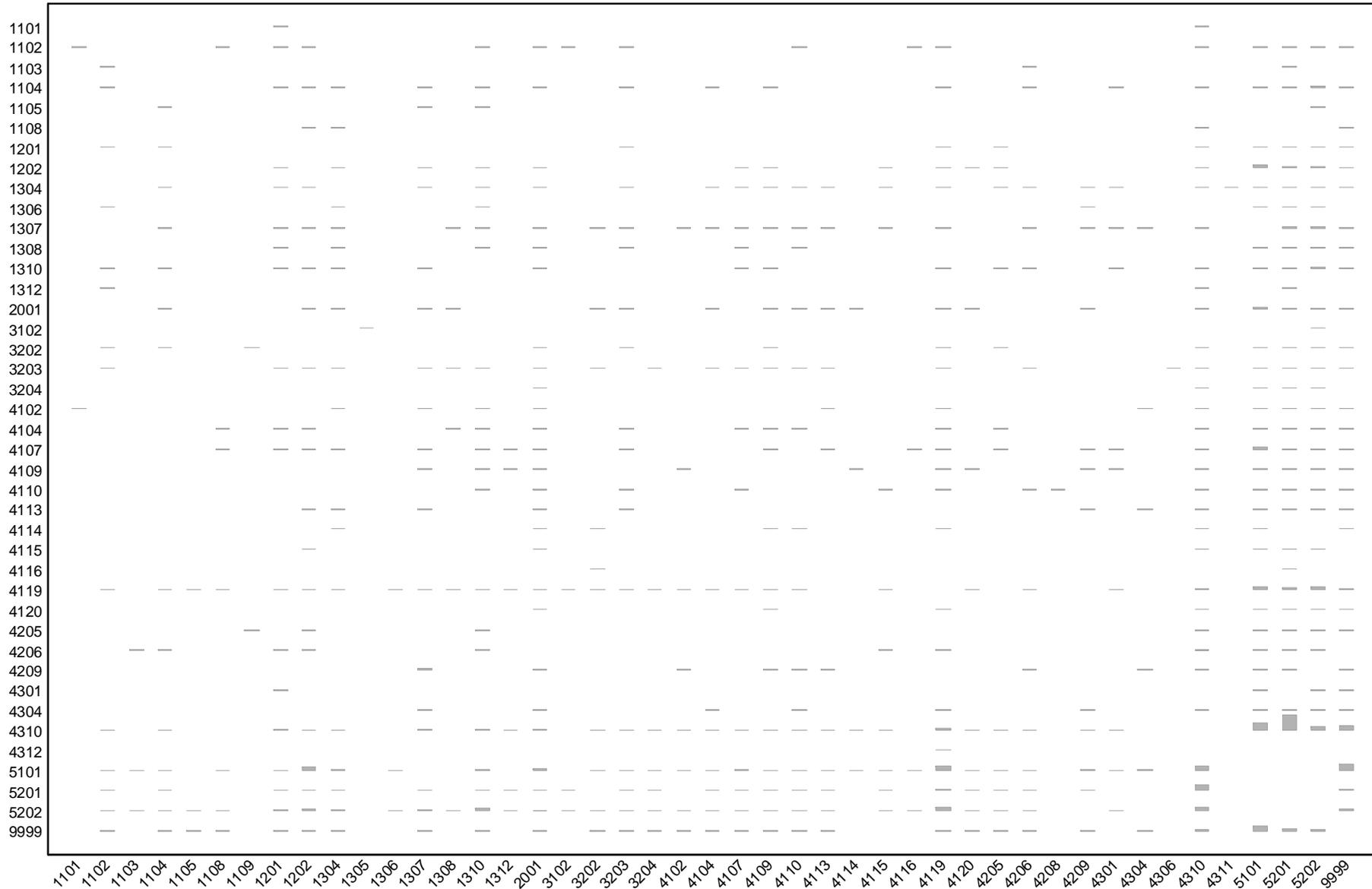
Iceland, 1901



(Excluding diagonals)

Microclasses

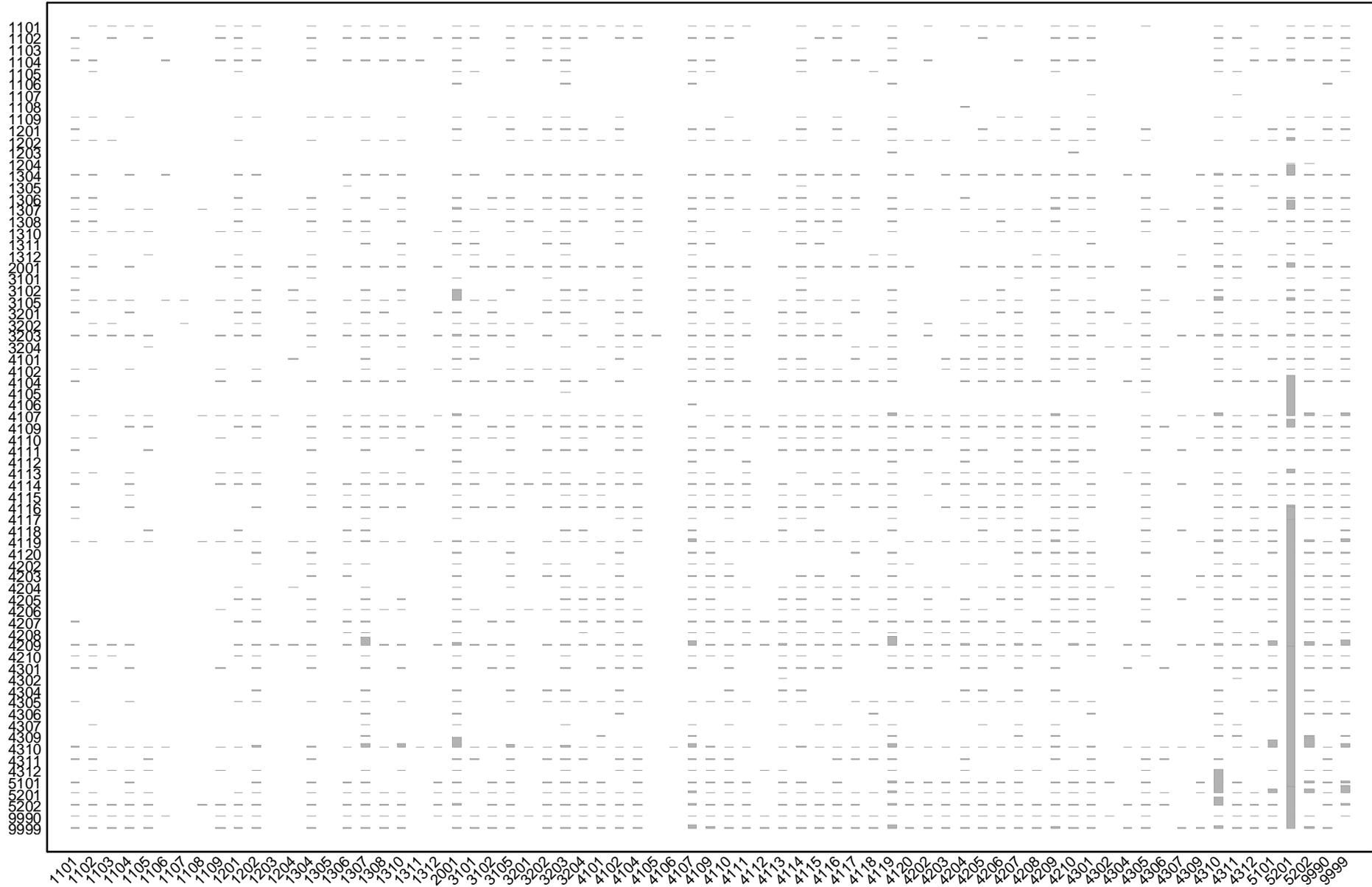
Iceland, 1901



(Excluding diagonals and pseudo-diagonals)

Microclasses

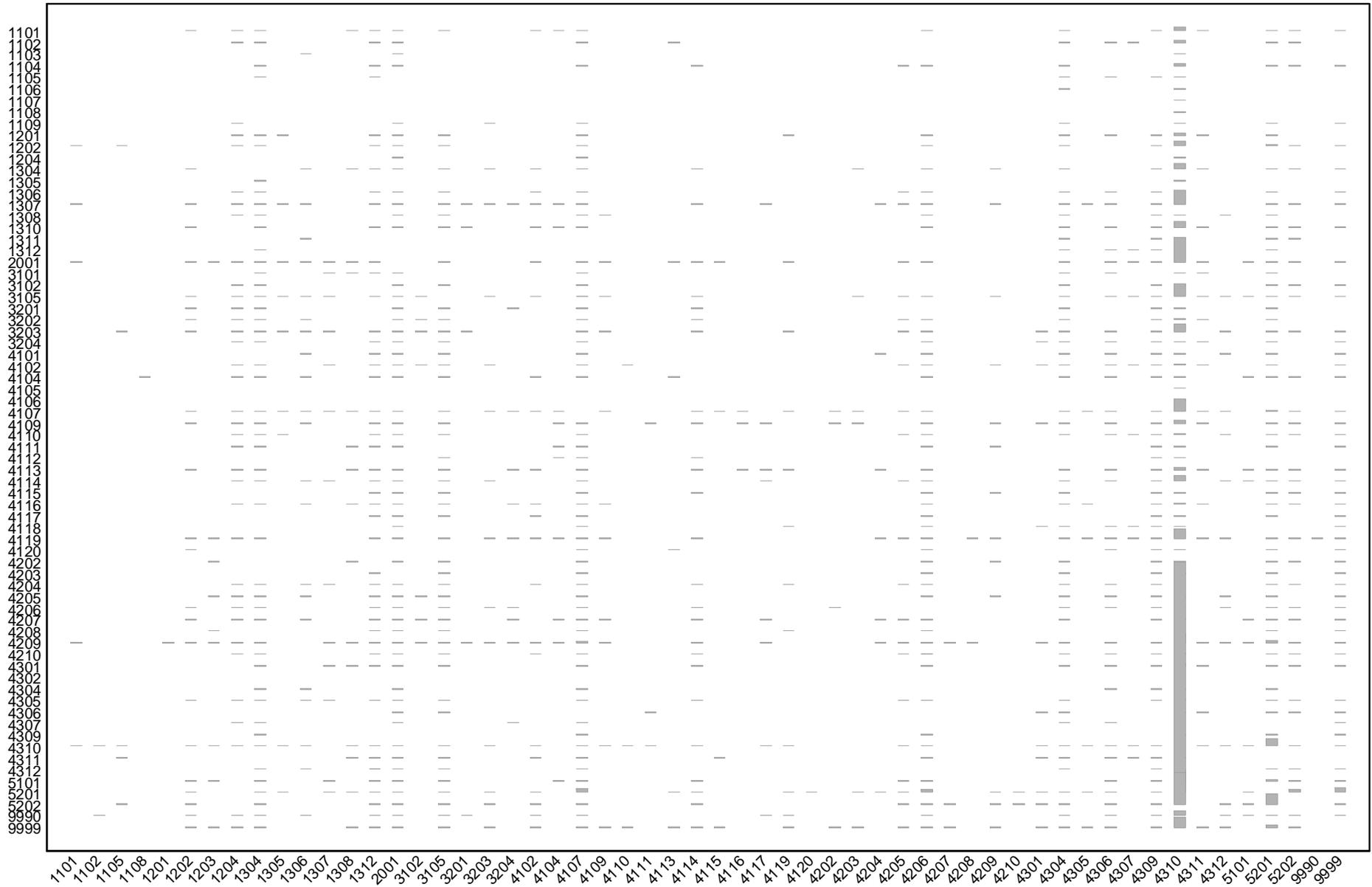
Norway, 1865



(Excluding diagonals, n*20)

Microclasses

Norway, 1865, m-f

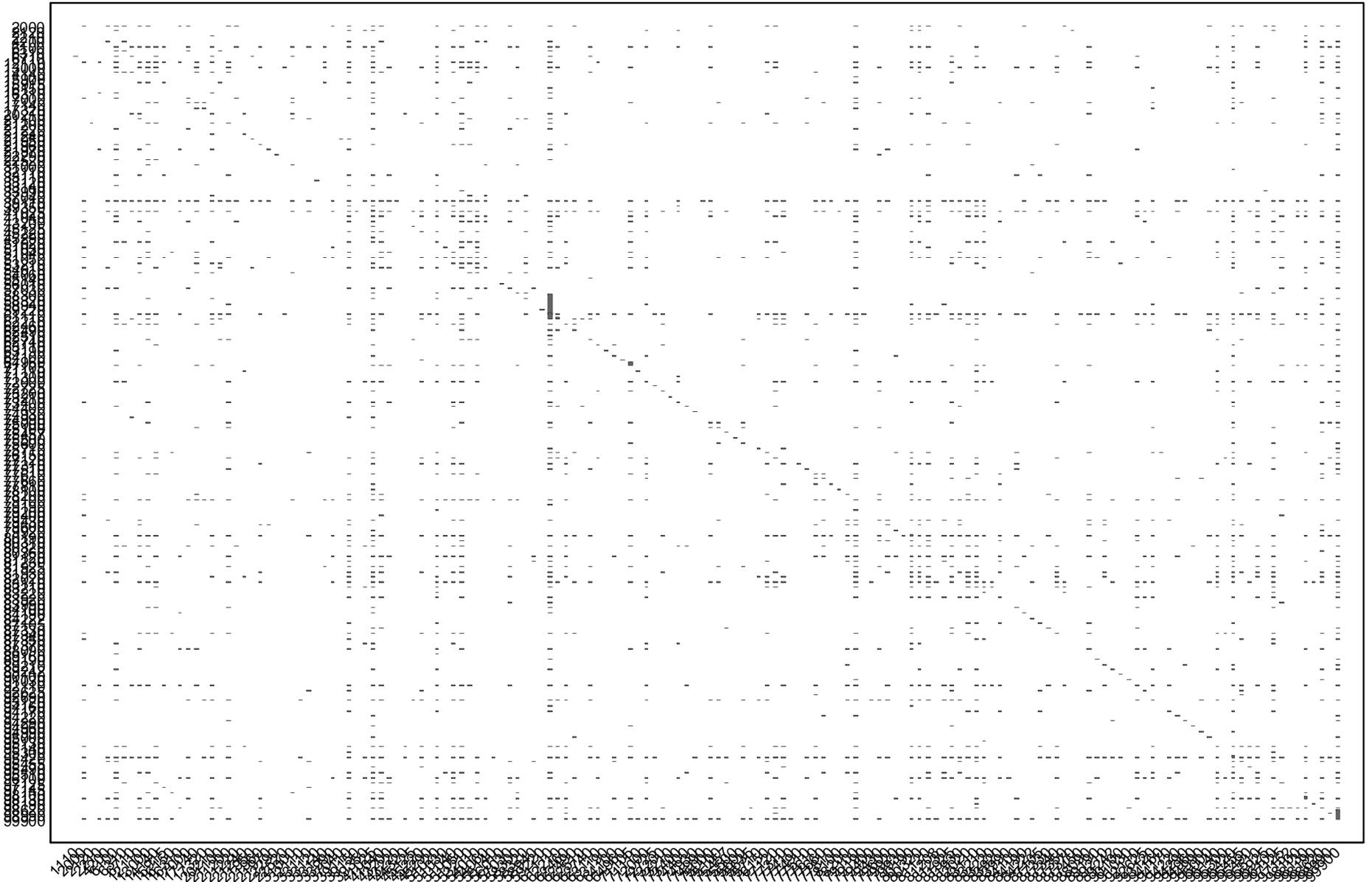


(Excluding diagonals, n*20)

SONOCS/WOG, April 2012

USA, 1850, m-m

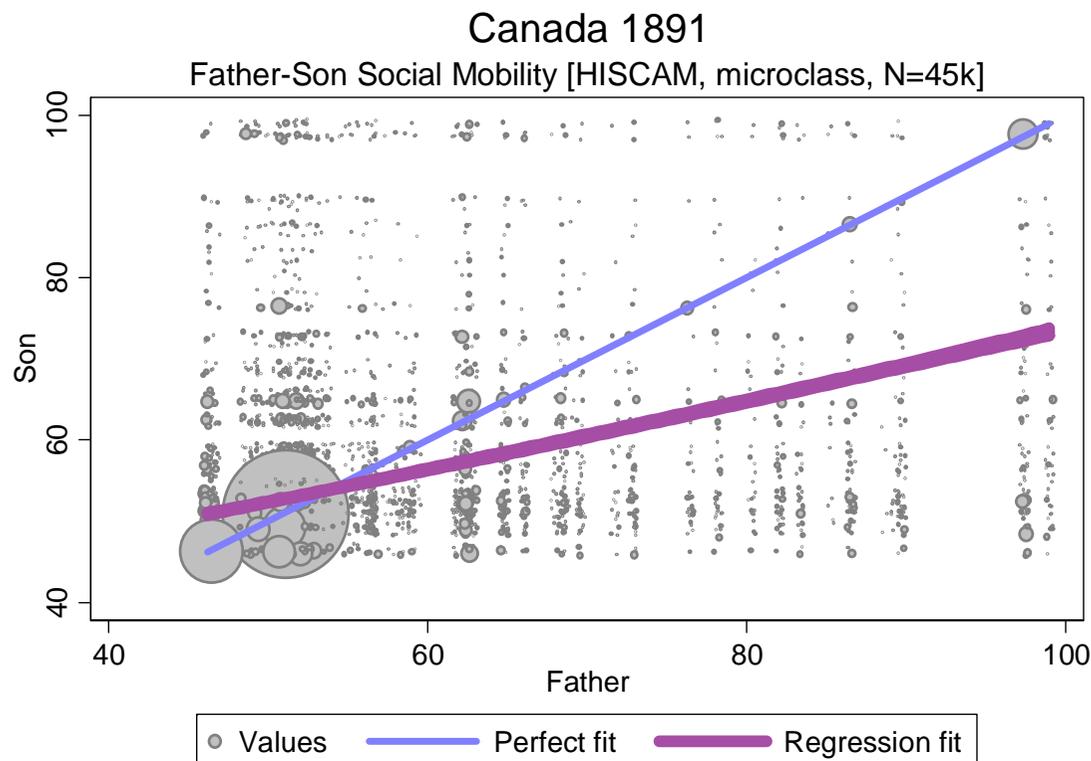
HISCO units



(n*4)

What can we do with such data?

- a) *Statistical models of occupation-based outcomes*
- b) *Statistical models of the association process*
- c) *Network depictions of prevalence of connections (next talk)*



SONOCS/WOG, April 2012

	Intergenerational HISCAM (all m-m) R
Canada	1871= 0.57 ; 1881= 0.47 ; 1891= 0.46 ; 1901= 0.43
Iceland	1801= 0.41 , 1901= 0.07
Sweden	1900= 0.37
Britain	1851= 0.21 ; 1881ew= 0.36 ; 1881s= 0.30
USA	1850= 0.30 ; 1860= 0.33 ; 1870= 0.33 ; 1880= 0.31 ; 1900= 0.33
Norway	1801= 0.23 ; 1865= 0.23 ; 1875= 0.29 ; 1900= 0.27

(a) Model individual outcomes: Linear/random/fixed effects

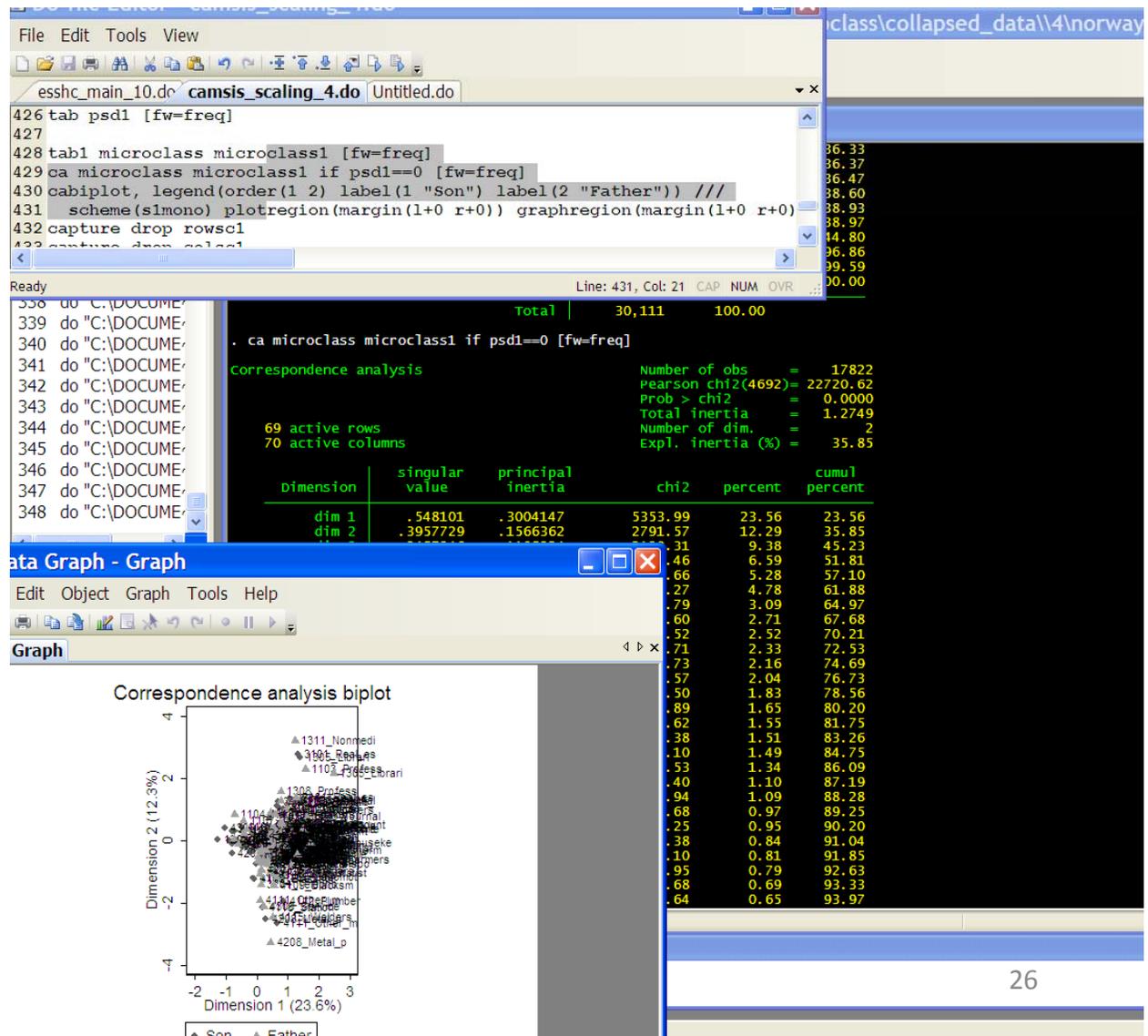
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	(1)+fath HISCAM	(2) + f.e. HISCO	(2) + f.e. microclass	(2) + r.e. HISCO	(2) + r.e. microclass
Age (linear)	29.5	32.1	35.7	34.6	35.7	34.5
Female	-120.9	-127.2	-128.6	-130.1	-128.8	-130.1
Jewish	7.9	7.5	7.1	7.0	7.1	7.0
Sami	1.6	1.8	2.2	2.1	2.2	2.1
Finnish	-2.0	-1.7	-1.7	-1.9	-1.7	-1.9
Urban	36.6	32.3	18.7	19.6	19.0	19.8
Cohabits	-19.6	-18.5	-16.5	-17.0	-16.5	-17.0
Father's HISCAM		37.5		5.4	3.6	6.5
Rho			0.197	0.038	0.086	0.026
r2	0.109	0.119				
Data: Sweden 1900, N=124238, Child HISCAM predicted by father's HISCAM. T-statistics.						

(b) Association models

‘Cambridge Social Interaction and Stratification Scales’

See www.camsis.stir.ac.uk/hiscam & Lambert et al. (2012) for historical data e.g.s

- Social Interaction Distance (‘SID’) analysis
- RC(II) model / Correspondence analysis
- First dimension of association can usually be labelled as ‘stratification’



How to use SID analysis effectively..?

- Carefully prepared specific analysis...
- ..or semi-automated comparisons?
- Fine- v's coarse-grained analysis?
- ✓ Scales scores can indicate change in occupations through context
- ✓ Model fit statistics allow study of trends/structures

	Fully automated , m-f homogamy, %inertia in dims 1+2	Fully automated , father-son, correlation to contemporary CAMSIS
Canada	1871= 0.90 ; 1881= 0.63 ; 1891= 0.51 ; 1901= 0.47	1871= 0.38 ; 1881= 0.44 ; 1891= 0.56 ; 1901= 0.64
Iceland	1801= 0.94 , 1901= 0.73	1801= 0.76 , 1901= 0.22
Sweden	1900= 0.56	1900= 0.11
Britain	1851= 0.48 ; 1881ew= 0.56 ; 1881s= 0.53	1851= 0.66 ; 1881ew= 0.66 ; 1881s= 0.10
USA	1850=. ; 1860= 0.55 ; 1870= 0.67 ; 1880= 0.53 ; 1900= 0.50	1850= 0.01 ; 1860= 0.16 ; 1870= 0.03 ; 1880= 0.12 ; 1900= 0.62
Norway	1801= 0.87 ; 1865= 0.78 ; 1875= 0.58 ; 1900= 0.64	1801= 0.68 ; 1865= 0.49 ; 1875= 0.65 ; 1900= 0.20

Summary: Social connections between occupations

- *Connections are central to social organisation of the stratification system [e.g. Bottero 2005]*
- Problems of data preparation and scale
 - Occupational coding – NAPP; HISCO; Microclass
 - Identify social connections (within hhld NAPP)
 - Select/discard some types of connections (e.g. farming)
- Analytical approaches
 - Model with proxy indicators, random or fixed effects
...Focus on the social connection..
 - **Association models**
 - **Network analysis**

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