OCCUPATIONAL STATUS OPERATIONALIZATION

Jan 25, 2023

OUTLINE

1. Basics of measurement (operationalization)
2. How do we evaluate our measurement strategies?
3. Categorizing occupations
    1. Activity
4. Historical occupational stratification schemes
    1. Class-based measures
    2. Prestige-based measures
5. Takeaways

DIVISION OF LABOR

- Friday's activity showed how greater division of labor facilitates:
  - Coordination
  - Productivity
  - Less stress (?)
  - (wealth) equality
- Outstanding questions:
  - How are social value judgments distributed across the division of labor?
  - How do we measure those value judgments?
  - What aspects of status as a concept make measurement difficult?

OPERATIONALIZATION

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EXAMPLE RESEARCH QUESTION

- What is the impact of the advent of women's collegiate athletics on women's educational attainment?

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OPERATIONALIZATION

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CONSIDERATIONS WHEN OPERATIONALIZING

- Theoretical frame should guide (most) decisions
- However, we are also constrained by:
  - Time, money, etc.
  - some things may be easier to measure than others
    - at least at first glance
- Sometimes operationalization can also happen **after** measurement of underlying variables
  - E.g. scales (multiple items) or collapsing existing measures based on theoretical model

OPERATIONALIZATION

VARIABLE TYPES

- Nominal
- Interval
- Ordinal
- Ratio

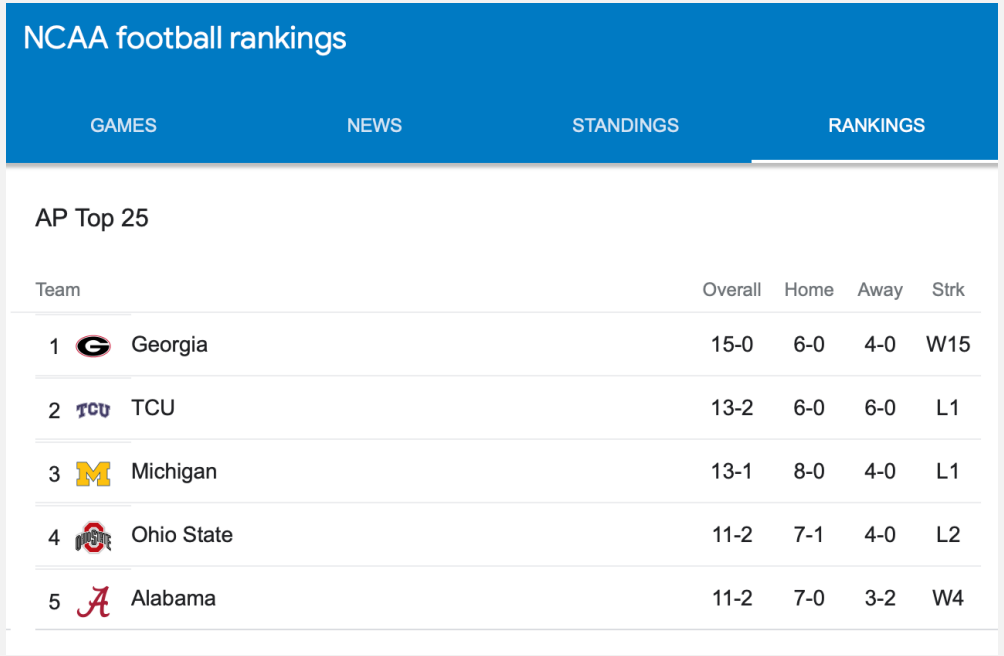
VARIABLE TYPES - NOMINAL

Man

Woman

Non-binary

VARIABLE TYPES - ORDINAL



NCAA football rankings

GAMES | NEWS | STANDINGS | RANKINGS

AP Top 25

	Team	Overall	Home	Away	Strk
1	Georgia	15-0	6-0	4-0	W15
2	TCU	13-2	6-0	6-0	L1
3	Michigan	13-1	8-0	4-0	L1
4	Ohio State	11-2	7-1	4-0	L2
5	Alabama	11-2	7-0	3-2	W4

VARIABLE TYPES - ORDINAL

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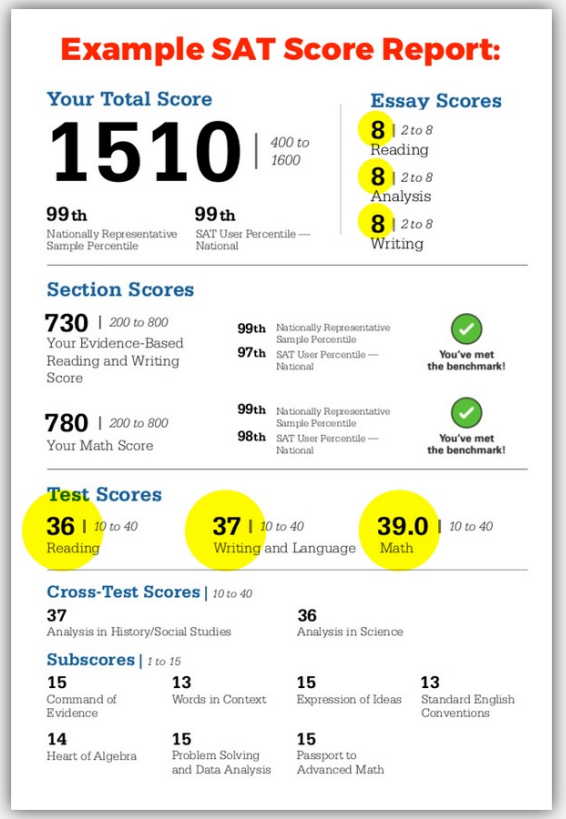
1. 
2. 
3. 
4. 
5. 

Distance between ranks is not necessarily standard!

VARIABLE TYPES - INTERVAL

- Equal distance between values
- **No** true zero



Example SAT Score Report:

Your Total Score

1510 | *400 to 1600*

99th Nationally Representative Sample Percentile

99th SAT User Percentile — National

Essay Scores

8 | *2 to 8* Reading

8 | *2 to 8* Analysis

8 | *2 to 8* Writing

Section Scores

730 | *200 to 800* Your Evidence-Based Reading and Writing Score

99th Nationally Representative Sample Percentile

97th SAT User Percentile — National

You've met the benchmark!

780 | *200 to 800* Your Math Score

99th Nationally Representative Sample Percentile

98th SAT User Percentile — National

You've met the benchmark!

Test Scores

36 | *10 to 40* Reading

37 | *10 to 40* Writing and Language

39.0 | *10 to 40* Math

Cross-Test Scores | *10 to 40*

37 Analysis in History/Social Studies

36 Analysis in Science

Subscores | *1 to 15*

15 Command of Evidence

13 Words in Context

15 Expression of Ideas

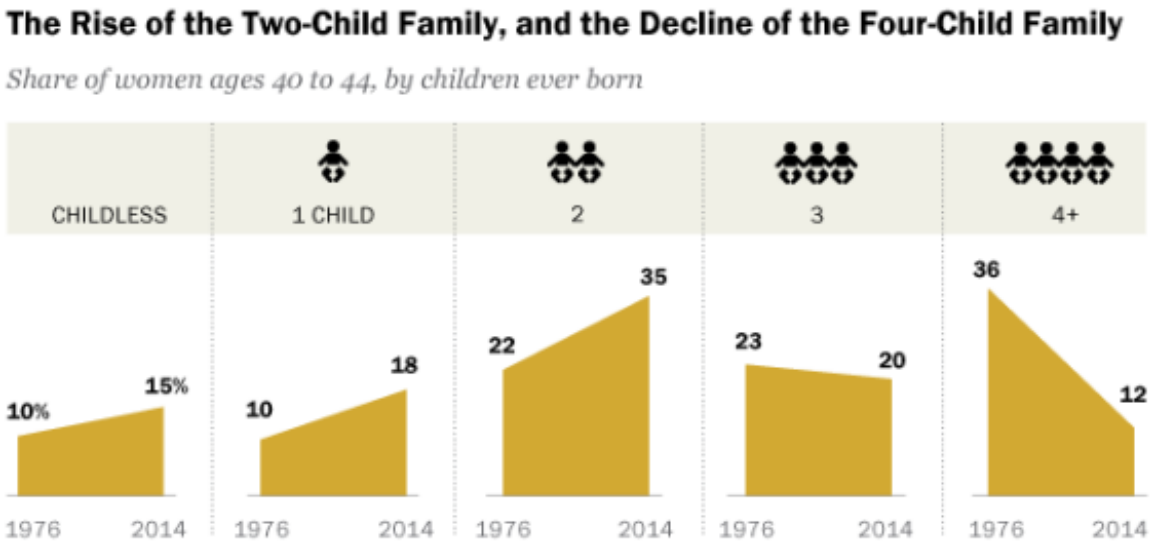
13 Standard English Conventions

14 Heart of Algebra

15 Problem Solving and Data Analysis

15 Passport to Advanced Math

VARIABLE TYPES - RATIO



SUMMARY

	Nominal	Ordinal	Interval	Ratio
Categorizes observations into groups	☑	☑	☑	☑
Ranks observations		☑	☑	☑
Equal distances between ranks/positions			☑	☑
True zero is meaningful				☑

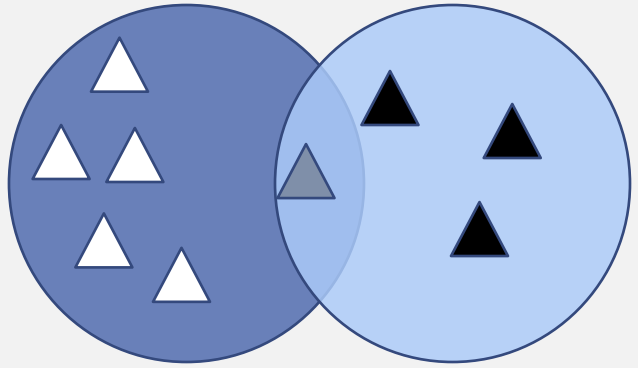
OCCUPATIONAL STATUS

- Most frequently ends up being:
  - Ordinal (**ranks**) or Interval (**equal intervals**) but sometimes also Ratio (**true zero)**

- Can be either:
  - Discrete (categories)
    - ordinal
  - Continuous (numbers)
    - Interval/Ratio

DISCRETE

- **Mutually Exclusive**
  - No category overlap
- Exhaustive
  - Everything is covered



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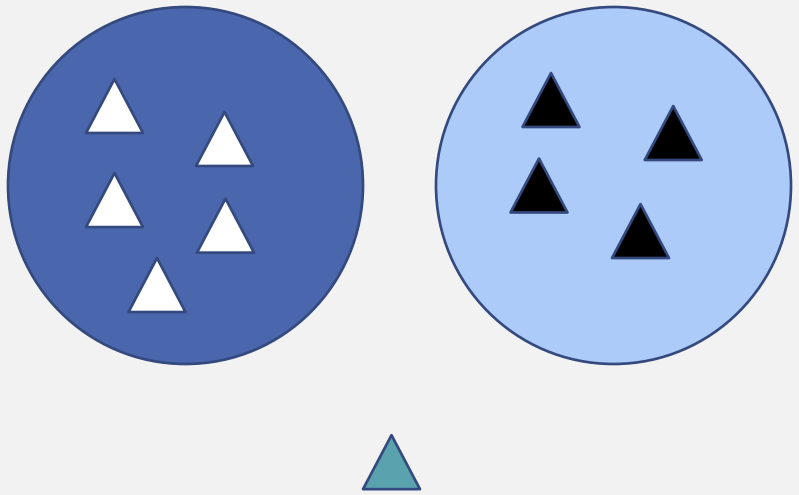

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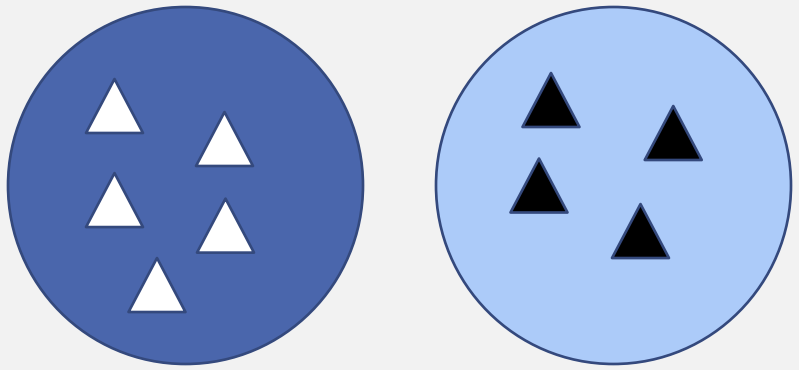
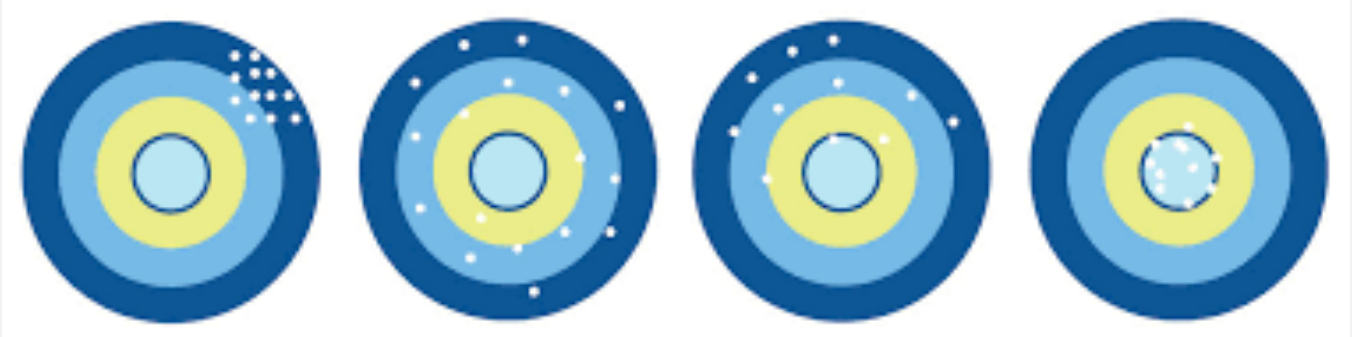


HOW DO WE EVALUATE OUR OPERATIONALIZATIONS

1. Validity
2. Reliability



VALIDITY

CONTENT

- Face Validity
- Construct Validity

CRITERION

- Concurrent Validity
- Predictive Validity

VALIDITY

CONTENT

- Face Validity
  - ("makes sense" test)
- Construct Validity

CRITERION

- Concurrent Validity
- Predictive Validity

VALIDITY

CONTENT

- Face Validity
- Construct Validity
  - Does our measure reflect our concept?
  - Is it instead measuring something else?

CRITERION

- Concurrent Validity
- Predictive Validity

VALIDITY

CONTENT

- Face Validity
- Construct Validity

CRITERION

- Concurrent Validity
  - We expect our measurement to be similar to something already measured well
- Predictive Validity

VALIDITY

CONTENT

- Face Validity
- Construct Validity

CRITERION

- Concurrent Validity
- Predictive Validity
  - Does our measure predict something we expect it to, given our theoretical frame?

STATUS

How do we apply these standard measurement strategies to operationalizing occupational status?

STATUS AS A CONCEPT

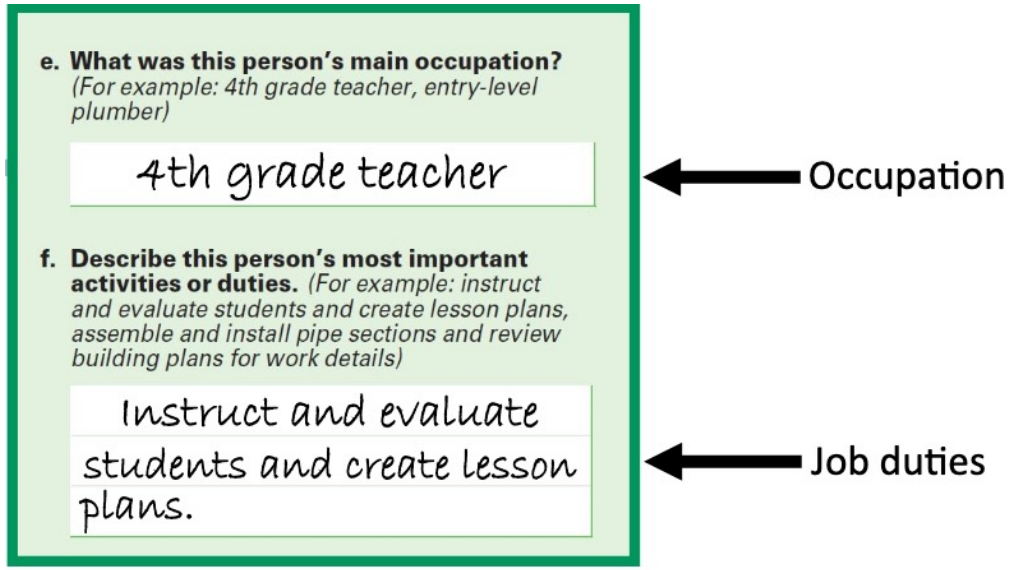
- Depending on where you sit within sociology (& social science), status can be an elusive concept to define clearly
- Broadly...we have considered up to this point to be a system of assigning social value to social entities
  - What does value mean in this context?
  - Which social entities does it apply to and where do we draw the boundaries?
    - Can status be measured in the same way in occupations as disciplines? Or universities?

OCCUPATIONS AS A FIELD

- As division of labor has grown more complex, the number and range of occupations has grown immensely
  - In the 2022 Occupational Outlook Handbook, lists 832 occupations
  - Alphabetical Indexes of Industries and Occupations 32,000 job titles
  - Tend to be based on: industry, skills required for the job,
- How do we compare across industries?
- Difficult to satisfy all requirements
  - Mutually exclusive & exhaustive, especially

HIDDEN STEP 1: ORGANIZING JOBS INTO OCCUPATIONS

- Nominal category
- Oftentimes, people rely on standard systems – e.g.
  - Census/American Community Survey
  - Department of Labor
  - Standard Occupational Classification (SOC)
  - International Standard Classification of Occupations
- Harder than it sounds



Occupation

Job duties

Occupation data is collected on the ACS through the use of two write-in questions. Respondents are asked to state their main occupation and describe their most important activities or duties. Based on the detail of these responses, each respondent is assigned a 4-digit Census Occupation Code to describe the work they do.

EXAMPLE OF OCCUPATIONAL GROUPING

Census Occupation Index	
Occupation Description	Census Occupation Code
Teacher electronics	2200
Teacher elementary school	**2310**
Teacher engineering	2200
Teacher English	2200
Teacher English literature	2200

Clerical coders at the National Processing Center use the Census Alphabetical Index of Occupations to classify each respondent's occupation write-in with an occupation code.* The index contains over 30,000 job titles that each correspond to one of the 570 Census Occupation Codes. Coders also use respondents' job duties, employer name, industry, and other characteristics to determine the best code for each case.

EXAMPLE OF OCCUPATIONAL GROUPING

Census Occupation Code List	
Occupation Description	Census Occupation Code
Educational Instruction, and Library Occupations:	2205-2555
Postsecondary Teachers	2205
Preschool and Kindergarten Teachers	2300
Elementary and Middle School Teachers	**2310**
Secondary School Teachers	2320
Special Education Teachers	2330

EXAMPLE OF OCCUPATIONAL GROUPING

Description	2017 Industry Restriction	2018 Census Occupation Code	2018 SOC Code
Teacher aeronautics	7870	2205	25-1032
Teacher agricultural economics	7870, 7880	2205	25-1063
Teacher agricultural engineering	7870, 7880	2205	25-1032
Teacher agricultural science	7870, 7880	2205	25-1041
Teacher agriculture	7870, 7880	2205	25-1041
Teacher agronomy	7870, 7880	2205	25-1041
Teacher algebra	7870, 7880	2205	25-1022
Teacher algology	7870	2205	25-1042
Teacher analytical chemistry	7870	2205	25-1052
Teacher anatomy	7870	2205	25-1071
Teacher anesthesiology	7870	2205	25-1071
Teacher animal anatomy	7870	2205	25-1041
Teacher animal husbandry	7870, 7880	2205	25-1041
Teacher animal nutrition	7870, 7880	2205	25-1041
Teacher animal pathology	7870	2205	25-1041
Teacher animal physiology	7870	2205	25-1041

EXAMPLE OF OCCUPATIONAL GROUPING

ACTIVITY

- https://cascotweb.warwick.ac.uk/#/classification/soc2020

HISTORICAL STRATEGIES

Class-based

1. USE CONCURRENT VALIDITY

- We expect our target variable and a previously well-measured variable to **move together** in some capacity
- We think that high status occupations must be linked to more education and higher income
  - **So** we use some measure of the central tendency of education & income level for people within one occupation
- **BUT** this is backwards causally
  - and far more class based than status based

HOWEVER, IT'S FAIRLY COMMON

- Education
- Skills
- Income

Education viewed as indicative status while income equals class

- US Census
- GB Census

Table 1 US Census Occupational Categories, 1940 and 1970

1940[a]	1970[b]
Professional	Professional, technical, and kindred workers
Proprietors, managers and officials	Managers and administrators, except farm
farmers (owners and tenants)	Sales workers
wholesale and retail dealers	Clerical and kindred workers
other proprietors, managers, and officials	Craftsmen and kindred workers
Clerks and kindred workers	Operators, except transport
Skilled workers and foremen	Transport equipment operators
Semiskilled workers	Laborers, except farm
Unskilled workers	Farmers and farm managers
farm laborers	Farm laborers and farm foremen
laborers, except farm	Service workers, except private household
servant classes	Private household workers

[a] From Edwards 1943.
[b] From US Census 1971.

BLAU & DUNCAN

1. Self-employed professionals
2. Salaried professionals
3. Managers
4. Salesmen, other
5. Proprietors
6. Clerical
7. Salesmen, retail
8. Craftsmen, manufacturing
9. Craftsmen, other
10. Construction workers
11. Manufacturing operatives
12. Other operatives
13. Service workers
14. Laborers, manufacturing
15. Laborers, other
16. Farmers
17. Farm laborers

Arranged in descending order of median income and education

Table 1. Goldthorpe class scheme (Erikson and Goldthorpe, 1992: 38–39).

Full version		Collapsed versions					
		Seven-class version		Five-class version		Three-class version	
I	Higher grade professionals, administrators and officials; managers in large industrial establishments; large proprietors	I + II	Service class: professionals, administrators and managers; higher grade technicians; supervisors of non-manual workers	I–III	White-collar workers	I–III + IVa + b	Non-manual workers
II	Lower grade professionals, administrators and officials; higher grade technicians; managers in small industrial establishments; supervisors of non-manual employees						
IIIa	Routine non-manual employees, higher grade (administration and commerce)	III	Routine non-manual workers: routine non-manual employees in administration and commerce; sales personnel; other rank-and-file service workers				
IIIb	Routine non-manual employees, lower grade (sales and services)						
IVa	Small proprietors, artisans and so on, with employees	IVa + b	Petty bourgeoisie: small properties and artisans and so on, with and without employees	IVa + b	Petty bourgeoisie		
IVb	Small proprietors, artisans and so on, without employees						
IVc	Farmers and small holders; other self-employed workers in primary production	IVc	Farmers: farmers and small holders and other self-employed workers in primary production	IVc + VIIb	Farm workers	IVc + VIIb	Farm workers
V	Lower grade technicians; supervisors of manual workers	V + VI	Skilled workers: lower grade technicians; supervisors of manual workers, skilled manual workers	V + VI	Skilled workers	V + VI + VIIa	Manual workers
VI	Skilled manual workers						
VIIa	Semi-skilled and unskilled manual workers (not in agriculture etc.)	VIIa	Non-skilled workers: semi- and unskilled manual workers (not in agriculture etc.)	VIIa	Non-skilled workers		
VIIb	Agricultural workers and other workers in primary production	VIIb	Agricultural labourers: agricultural and other workers in primary production				

2. ARGUE THAT EMPLOYMENT RELATIONS SHAPE 'LIFE CHANCES'

- **Erickson-Goldthorpe-Portocarero (EGP)**
- Market situation
  - Income
  - education
- Work situation
  - Authority
  - control

OTHER ISSUES

- Confounding around education
  - Some jobs require years of lower pay / training that others do not
    - E.g. Residency for doctors but not for dentists
- Within-class heterogeneity

3. USE A THEORETICAL CORRELATE

- Weber's theory suggests that one element of the status order is how it impacts how we relate to other people – who do we:
  - Associate with
  - Marry
  - Befriend/hang out with regularly
  - Live nearby
- **Homophily**

TABLE 1.* A PARTIAL LISTING OF THE CONDITIONAL PROBABILITIES OF ASSOCIATING WITH ALTERS IN OCCUPATION B, GIVEN EGO'S OCCUPATION, FOR SELECTED ROWS AND COLUMNS OF THE ORIGINAL 55-BY-55 MATRIX, WITH SELECTED ROW AND COLUMN MARGINAL FREQUENCIES

		Ego's Occupational Category **																				
Alter Occupational Category**		10	11	12	13	14	15	16	17	18	.	.	.	78	79	80	82	84	85	90	92	93	Row Frequency Totals
Duncan Occupational Code	10	10	..	..	..	4	4	3	5	..	.	.	.	..	..	..	..	..	..	..	..	..	42
	11	..	..	..	..	..	..	1	..	7	.	.	.	..	..	..	..	..	1	..	..	..	9
	12	4	..	..	..	4	2	2	1	..	.	.	.	..	..	..	..	1	..	..	..	..	22
	13	..	..	..	..	4	..	1	1	7	.	.	.	..	..	..	..	..	..	..	..	..	9
	14	..	..	..	40	4	4	3	1	..	.	.	.	..	..	..	..	4	4	..	..	..	44
	15	8	..	100	..	24	25	11	7	7	.	.	.	..	..	..	..	..	3	..	..	..	150
	16	2	..	..	..	12	4	25	7	..	.	.	.	..	4	..	..	2	1	..	..	..	106
	17	6	..	..	..	8	1	3	9	..	.	.	.	..	..	..	3	..	..	..	..	..	104
	18	2	..	..	..	4	1	1	2	20	.	.	.	2	..	8	..	1	..	1	..	2	53
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	78	..	..	..	..	..	..	..	..	..	.	.	.	7	4	..	..	1	3	..	..	..	21
	79	..	..	..	..	..	1	..	1	..	.	.	.	5	9	..	3	1	4	1	..	..	28
	80	..	..	..	..	..	1	..	..	7	.	.	.	..	..	15	..	2	..	..	..	..	6
	82	..	..	..	..	..	..	..	..	7	.	.	.	..	..	..	10	1	3	1	1	2	28
	84	..	..	..	..	..	1	1	1	..	.	.	.	..	9	31	17	27	7	14	17	18	145
	85	..	..	..	..	..	2	2	1	..	.	.	.	7	..	8	13	3	10	11	6	4	60
	90	..	..	..	..	..	..	..	..	..	.	.	.	5	9	8	..	9	9	20	7	6	79
	92	4	..	..	..	..	..	..	1	..	.	.	.	5	17	8	3	5	9	15	33	6	92
	93	2	..	..	..	..	..	..	..	..	.	.	.	5	..	8	3	9	4	10	10	24	88
Per cent totals***		104	100	100	100	100	103	107	103	102	.	.	.	97	99	101	106	106	96	97	97	100	
Column frequency totals		52	5	1	5	25	116	120	109	15	.	.	.	42	23	13	40	160	70	80	72	50	2465

* Because of the size of a 55-by-55 matrix, we have presented only a partial listing of the conditional probabilities to illustrate the nature of the original data matrix. The interested reader may write the senior author for a copy of the complete table.

** Duncan Occupational Code. See Table 2 for occupations included in each code category.

*** Per cent totals do not always add to 100 because of rounding.

Edward O. Laumann, and Louis Guttman. "The Relative Associational Contiguity of Occupations in an Urban Setting." *American Sociological Review*, vol. 31, no. 2, 1966, pp. 169–78. *JSTOR*, https://doi.org/10.2307/2090902.

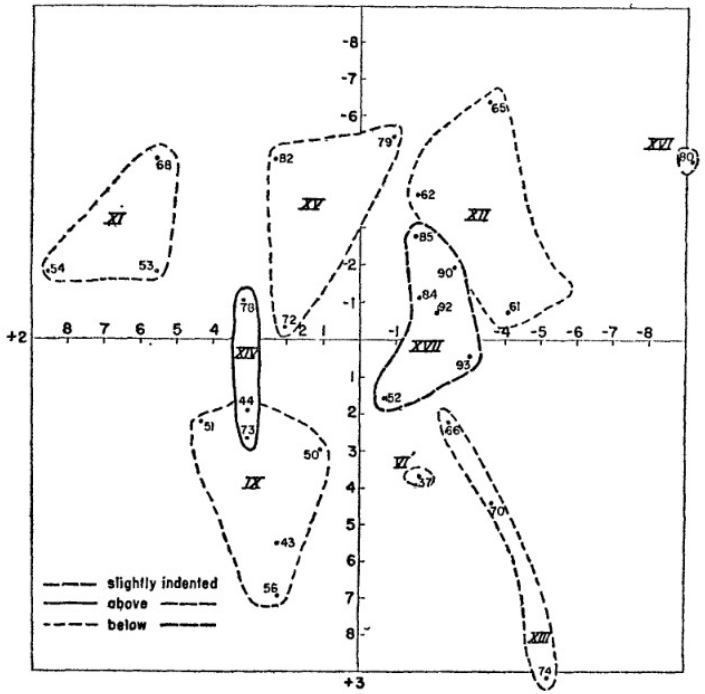


FIGURE 1. TOP VIEW OF THE THREE-SPACE.
Note: "Above" in the legend refers to the fact that clusters so marked are more extreme on the first axis than Grouping XVII, while "below" in the legend refers to clusters so marked that are lower on the first axis than Grouping XVII. "Slightly indented" in the legend refers only to Grouping XVII's location on the first axis.

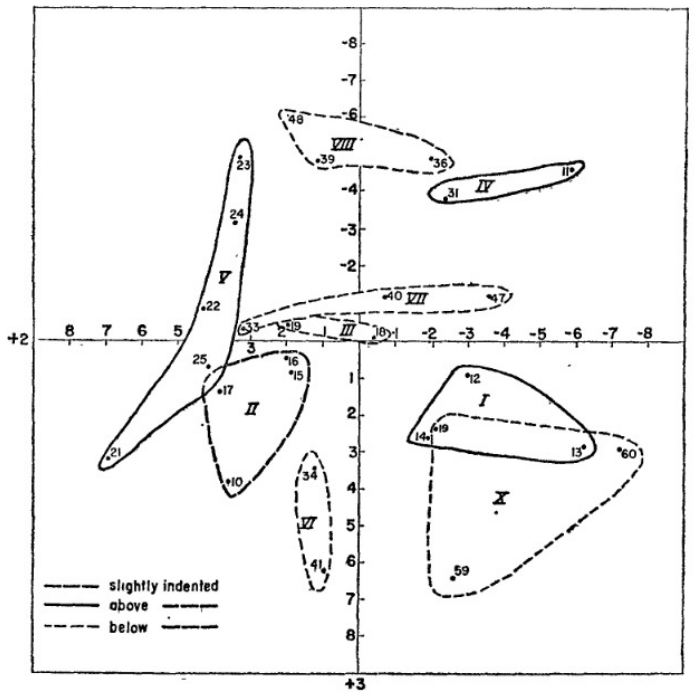
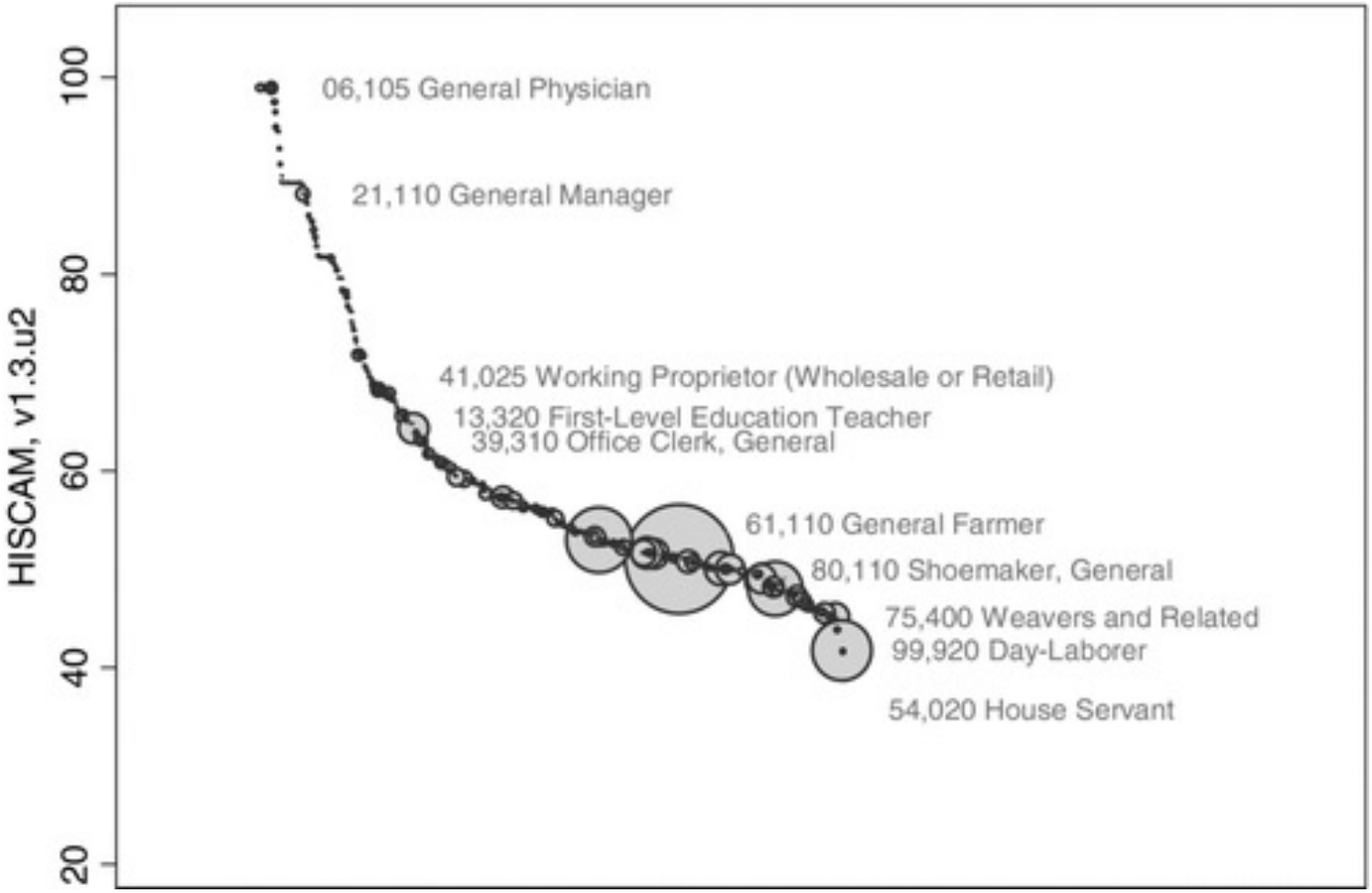


FIGURE 2. BOTTOM VIEW OF THE THREE-SPACE.
Note: "Above" in the legend refers to the fact that clusters so marked are more extreme on the first axis than Grouping II, while "below" in the legend refers to clusters so marked that are lower on the first axis than Grouping II. "Sightly indented" in the legend refers only to Grouping II's location on the first axis.



Paul S. Lambert, Richard L. Zijdeman, Marco H. D. Van Leeuwen, Ineke Maas & Kenneth Prandy (2013) The Construction of HISCAM: A Stratification Scale Based on Social Interactions for Historical Comparative Research, Historical Methods: A Journal of Quantitative and Interdisciplinary History, 46:2, 77-89, DOI: 10.1080/01615440.2012.715569

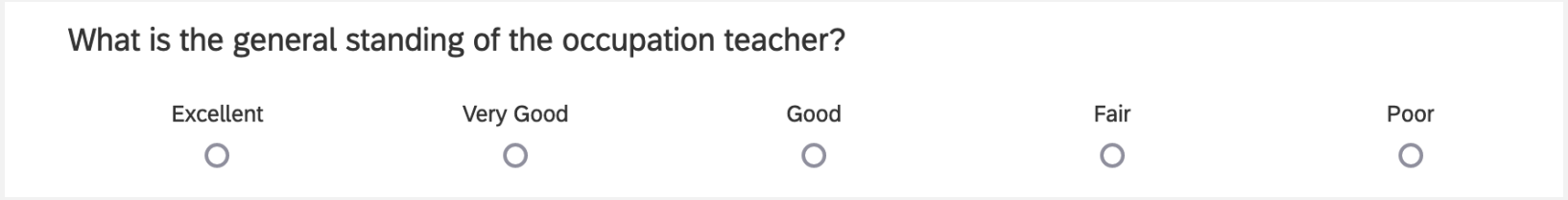
HISTORICAL STRATEGIES

Prestige-based

PUBLIC OPINION

- Class activity on the first day –
- Ask people to rank / sort occupations by ‘general standing’ or ‘social standing’

DUNCAN SEI



- Mean scores across respondents
- Share of respondents who select excellent or very good

DUNCAN SEI – BROADENING ESTIMATES

- SEI = 0.59 * **(percent of males > $3500**) + 0.55 *** (percent males > high school degree)** – 6.0

- Example – let's say paralegals were not originally measured:
  - 30% of all male paralegals make more than 3500/year
  - 50% of male paralegals have at least a high school degree
  - 0.59*30 + 0.55*50 -6.0 = 39.2

STANDARD OCCUPATIONAL PRESTIGE SCALE (SIOPS)

- Collected prestige data from 55 nations
  - Some nations had several studies (namely U.S. and GB)
- Argued very stable across nations
  - Although did acknowledge was more precise for more industrialized nations

Table 2 Major occupational classes; The Standard International Classification of Occupations[a]

Occupational category	Mean prestige scores
High-prestige professional and technical	68.4
Administrative and managerial	67.1
High-prestige clerical and related occupations	50.3
High-prestige sales	49.1
Low-prestige professional and technical	48.9
High-prestige agricultural	44.3
High-prestige production and related occupations	43.6
High-prestige service	40.8
Medium-prestige production and related occupations	32.1
Low-prestige clerical and related occupations	31.6
Low-prestige sales	28.1
Low-prestige agricultural	22.3
Low-prestige service	19.7
Low-prestige production and related occupations	19.6

[a]Adapted from Treiman (1977).

(ONE) FUNDAMENTAL DIFFICULTY OF (A LOT) OF SOCIAL SCIENCE RESEARCH

What is going on in there???

CRITICISMS OF PUBLIC OPINION MEASURES

- Are we sure people are thinking "**prestige**" and not "is that job desirable?"
- Goldthorpe & Hope found scores based on general/social standing roughly equivalent to a combination of 'standard of life' measures
- Coxen & Jones
- Is the distinction important? How bad would this be for our measurement of status given our theory?

COXON & JONES

- Very critical of the precision of public opinion measures
- Argue for 'triangulation' strategy by using multiple tasks
  - Pairwise similarity
    - Given 2 occupations – rate how similar they are
  - Triadic similarity
  - Rankings/ratings on several criteria
  - Free sort

COXON & JONES

- Very critical of the precision of public opinion measures
- Argue for 'triangulation' strategy by using multiple tasks
  - Pairwise similarity
  - Triadic similarity
    - Given 3 occupations, which 2 are most alike and which 2 are least alike
  - Rankings/ratings on several criteria
  - Free sort

COXON & JONES

- Very critical of the precision of public opinion measures
- Argue for 'triangulation' strategy by using multiple tasks
  - Pairwise similarity
  - Triadic similarity
  - Rankings/ratings on several criteria
    - Usefulness to society; general standing; prestige and rewards; belief about income
    - **How much you know about the job**
  - Free sort

COXON & JONES

- Very critical of the precision of public opinion measures
- Argue for 'triangulation' strategy by using multiple tasks
  - Pairwise similarity
  - Triadic similarity
  - Rankings/ratings on several criteria
  - Free sort
    - Given a set of occupations, told to organize however they wanted

SCIENCE OF SCIENCE

considerations

FACE VALIDITY

ally viewed as having low status. The 3%, 6%, and 8% of NORC respondents who rated shoeshiners, soda-fountain clerks, and janitors as having high community standing were flying in the face of majority public opinion.[8] These responses suggest various biases, perhaps militant egalitarianism, response set, fatigue, ignorance, or misplaced politeness. Yet these deviant evaluations are precisely the ones used in the SEI calculations.

DUNCAN SEI – GENDER SEGREGATION

- SEI = 0.59 * **(percent of males > $3500**) + 0.55 *** (percent males > high school degree)** – 6.0

- Example – let's say **nurses** were not originally measured:
  - 80% of all male nurses make more than 3500/year
  - 80% of male paralegals have at least a high school degree
  - 0.59*80 + 0.55*80 -6.0 = 85.2

PURPOSE OF SURVEY

- Hollingshead originally for a study on *Social Class and Mental Illness*
- Impacts the makeup of the occupational sample and thus final rankings & groupings
  - Includes hostler & railroad conductor but not computer programmer

HANDLING MULTIPLE JOBS?

- Most only ask for "primary" job in the past week
- How could this bias estimates?

CHANGES IN THE DIVISION OF LABOR

- How do we account for creation of new jobs in longitudinal research?
  - E.g. emergence of ‘consulting’

RESOURCES, PEOPLE, TIME

- Sometimes we are constrained by what we have available!

TAKEAWAYS

MEASUREMENT IS DIFFICULT

- Often impossible to satisfy every requirement
- We do the best we can & are upfront about weaknesses & strengths
- Sometimes you may have to make a tradeoff
  - Prioritize theory
- Science is a collective endeavor!

STATUS / CLASS ELISION

- Occupational stratification research has been limited by the lack of both **conceptual** and **operational** clarity in separating the ideas of class and status as separate dimensions of social life