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"The Measurement of Socioeconomic Status of Occupations in
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- 1970 Census
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- 1976 PNAD
- 1980 Census
- 1982 PNAD
- 1983 PNAD
- Other: _____

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The Measurement of Socioeconomic
Status of Occupations
Brazil - 1982 PNAD

A Preliminary Note

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The analyses reported herein were supported by a grant from the Spencer Foundation to the University of Wisconsin (College of Agricultural and Life Sciences) for research on development and the income returns to education. The project is directed by the writers in collaboration with Jose Pastore (University of Sao Paulo) and Brazil's National Center of Human Resources (Brasilia), Antonio Octavio Cintra, Director. Some of the data were prepared earlier under National Science Foundation Grant SES 7807414. This project is a part of a long term program in the Department of Rural Sociology on two basic problems in stratification theory: Variations in the Structure of Stratification (centered in Brazil) and the Social Psychology of Status Attainment (centered on the United States).

In 1980, Bills and Godfrey presented a paper at the "Symposium on Social Mobility, Employment, and the Brazilian Income Distribution" in Madison, WI, where they showed the results of a procedure to develop a socioeconomic index of occupations in Brazil.

The procedure is an extension of Kelley's work using multiple discriminant analysis to develop average status for 15 broad groups of occupations across a number of countries. Bills and Godfrey, using the 1973-PNAD data, classified 264 occupational titles into 82 groups (further expanded into 92 groups) according to the Brazilian Dictionary of Occupations (CBO: Classificacao Brasileira de Ocupacoes - Ministerio do Trabalho, 1977). CBO employs a four part structure (occupational titles, unit groups, sub-groups, and major groups). While Kelley employs three discriminant variables (father's occupation, education and income) Bills used only education and income variables.

Although there have been several attempts to develop a scale of Brazilian occupations (Haller and Saraiva-1972; Hutchinson-1957,1962; Castaldi, 1956; Valle e Silva,1973; Bills and Godfrey-1980) such scales are limited either by the small number of occupational titles employed, or by the specification of the sample used, or they were constructed so long ago that later changes in the Brazilian occupational structure warrants the building of a new scale. The Valle e Silva and the Bills scales are the only ones that seem universal enough for general usage. However we decide not to employ them in this project for the following reasons: the

Valle scale, as Bills reports, seems to "disproportionately reflects strictly income differentials" and the Bills scale needed to be reviewed in order to become more adequate, on one hand, to the specificities of the Brazilian occupational structure and, on other hand, to the data sets that were later produced by the IBGE.

Thus, although the same technique was used in this project, we made the following modifications in the original procedure.

1- We extended the analysis to those between 10 to 65 years of age. Bills, following a general criteriom in the literature, used only the ones above 15 years old. We regard our criterium more adequate to the Brazilian labor structure were participation in the labor market starts at an earlier age. We did analysed, as did Bills, the whole sample of males and females in an attempt to produce a more general scale.

2- The same discriminant variables used to score and classify occupational titles (income and education) were used here. However, the way these variables were measured and coded in 1982, differs from the 1973 sample. In 1973 both variables were colapsed into categories, and had to be recoded as the mid-point value in each category. This lowers the variance of the variables and causes the discriminant analysis to use same values for different observations. The possible consequence is to classify in the same group, occupations that otherwise would have different means of income and education. Fortunately, in the 1982- PNAD both variables were measured and coded as

interval scale (actual years of education, and monthly income). The recoded transformations are presented in annex. Income is expressed in units of minimum-wages. The data collection of the 1982-PNAD extended for a period of 12 weeks, when the Brazilian legal minimum wage changed. Thus, the cruzeiros units for the first 6 weeks express different income levels than the same value for the last 6 weeks of interview.

3- The 1982-PNAD has a more detailed occupational code with 363 titles and is the latest data set presently available to the project. Moreover, the use of CBO to group occupations for the purpose of assessing status scores seems improper since CBO is not structured according to status criteria. Thus, it is probable that when pooling together occupations according to CBO's units and sub-groups one will end up with occupations of different status in the same new categories.

Procedure

The question on "Occupation during last week" produced 363 occupational titles. Of these 53 occupational titles were disregarded since they presented a small number of observations ($N < 20$). The ill defined occupations were also disregarded. The analysis was done for 309 occupational titles.

In order to avoid *A priori* decisions in grouping occupational titles, we decided to consider each title as a group in itself. This would allow a final scale with more observed points. This procedure departs from the previous works. By treating each occupation as a group in itself we

attain less within group variation in the criteria variables. After the scale is produced, titles with the same score could be categorized for easiness of communication.

Following Bills and Godfrey, and J. Kelley, we used "discriminant analysis" to produce the occupational status scale. The technique follows Klecka (1975) and Levine (1977), and consists of computing canonical linear regression functions for each group such as that the weights of these functions maximize the zero-order correlation between the occupational groups and the composite of education and income (Fisher's linear discriminant functions). As a second step, the mean of the function for each group ("centroids") is calculated. These means are the most typical location of a case for a given group in the discriminant space. As Bills translates: "the most typical location of an employed individual from that occupation in the socioeconomic hierarchy of occupations". Since the centroids have no natural metric, we transform them into a 0.0 to 100.0 scale to make them more interpretable.

Results

The following table shows the 1982 occupational titles and the corresponding transformed centroid scores. 218 occupational groups were produced.

The function accounts for 84.47 percent of the total variance and produced pooled correlations of .93 and .51 between the canonical discriminant functions and education and income respectively.

The scale is heavily based on education. This should be expected since there is less variation of education than of income within each original group. The professionals and other credential-based occupations have specially small variations on the educational variable. Moreover, the largest standard deviations of income within the original groups, occur in those occupations that are defined in a very general terms (examples are: criador bovino, comerciante, outros proprietarios, etc.)

Although an examination of the table reflects a face validity of the scale, further analysis should demonstrate its worth in comparison with other existing scales.

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		1982 Occ. Code	1982 Occ. Title	Score
1	1	336	Vegetable pickers	0.01
2	2	475	Straw hatmakers	1.31
3	3	332	Sawmill workers	4.09
4	3	538	Grain millers	4.09
5	4	444	Lacemakers	4.26
6	5	304	Other agricultural and livestock workers	4.42
7	6	333	Charcoal makers	4.75
8	7	825	Laundresses	5.24
9	8	449	Net makers	5.41
10	8	753	Teamsters (oxen, horses, etc.)	5.41
11	9	301	Self-employed agric. & livestock producer	5.90
12	10	345	Stonecutters & rock drillers	6.06
13	11	612	Water seller or distributor	6.23
14	11	322	Fisherman	6.23
15	12	490	Basketmakers & mat weavers	6.88
16	13	564	Potters	7.54
17	14	334	Rubber tappers & collectors	7.70
18	15	577	Broommakers	8.03
19	16	579	Tobacco preparation workers	8.19
20	17	331	Lumberjacks	8.36
21	18	920	Garbagemen	8.52
22	18	826	Shoe-shiners	8.52
	19	613	Confectioners, etc.	8.68
	20	166	Midwives	9.01
	21	919	Gardeners (not crops)	10.00
26	22	539	Employed in the sugar industry	10.16
27	23	615	Seller of animal entrails	10.65
28	24	924	Manual laborers	10.98
29	25	513	Hodcarriers	11.14
30	26	303	Agricultural tractor operator	12.29
31	27	614	Greengrocers & street veg. & fruit vendors	12.45
32	27	371	Prospectors	12.45
33	28	511	Reinforced concreters	12.62
34	29	482	Carpenters	12.78
35	30	512	Bricklayers or masons	12.95
36	31	533	Butchers (slaughterhouses)	13.11
37	31	575	Vulcanizers & tire repairmen	13.11
38	31	805	Domestic servants	13.11
39	32	544	Employed in the vegetable oil industry	13.27
40	33	844	Janitorial staff	13.44
41	33	485	Sawyers	13.44
42	34	351	Operators of mineral extraction machinery	13.93
43	35	843	Watchman	14.09
44	36	813	Cooks	14.42
45	37	812	Hotel maids	14.59
46	38	616	Lottery ticket vendors	14.75
47	39	521	Operators of civil construction machinery	14.91
48	40	477	Shoemakers	15.24
	40	534	Occupations in the milk & milk products industry	15.24
50	41	30	Ranch or farm administrators	15.41

1	42	443	Textile Spinners	15.57
2	42	822	Barbers	15.57
3	43	537	Bakers	15.90
54	43	611	Seller at open-air market	15.90
55	43	762	Railroad construction workers	15.90
56	44	727	Small boat operators	16.23
57	45	540	Employed in the beverage industry	16.39
58	45	341	Miners	16.39
59	45	574	Rubber workers	16.39
60	45	578	Marble workers	16.39
61	45	535	Candymakers and confectioners	16.39
62	46	582	Ceramists and china makers	16.55
63	47	474	Embroiderers and fabric reweavers	16.72
64	48	519	Sidewalk & street paving workers	16.88
65	49	587	Employed in cement products industry	17.21
66	49	486	Plywood preparers	17.21
67	50	516	Tilers and parquetry workers	17.70
68	51	732	Stevedores and longshoremment	18.03
69	51	545	Employed in the food industry	18.03
70	51	921	Lubricators	18.03
71	52	470	Tailors and seamstresses	18.19
72	52	517	Plumbers and pipefitters	18.19
73	53	514	Painters & whitewashers	18.36
74	54	515	Stucco masons	18.52
75	54	411	Oven tender in metallurgical industry	18.52
76	55	450	Textile bleachers & dyers	18.68
77	56	583	Firers	18.85
78	56	916	Street parking watchmen	18.85
79	56	520	Flooring fitters & caulkers	18.85
80	56	442	Textile rovers & spoolers	18.85
81	57	417	Stone buffers & polishers	19.18
82	57	585	Employed in the paper industry	19.18
83	57	536	Fastmakers	19.18
84	58	441	Textile carders & combers	19.50
85	58	461	Leather goods makers & saddle & harness makers	19.50
86	58	811	Hotel keeper & boarding house proprietor	19.50
87	58	416	Tool grinders & sharpeners	19.50
88	59	414	Molders	19.67
89	60	489	Wood polishers	19.83
90	60	731	Port to ship crane operators	19.83
91	60	447	Weavers	19.83
92	61	601	Self-employed businessmen	20.00
93	62	859	Private security officers	20.16
94	62	841	Doormen	20.16
95	62	722	Boatswains	20.16
96	63	413	Wiredrawers	20.49
97	63	1	Farmers	20.49
98	64	484	Operators of joinery machinery	20.82
99	64	462	Tanners	20.82
00	64	420	Press operator	20.82
01	65	478	Shoe factory workers	21.14
02	65	617	Employed in other street vendor occupations	21.14
03	65	430	Tinsmiths	21.14

65	481	Cabinet makers & joiners	21.14
66	815	Bartenders	21.31
67	448	Tapestry and carpet weavers	21.63
07	68	581 Spray painters	21.63
08	68	586 Employed in the rubber products industry	21.63
09	69	426 Welders	21.96
10	70	584 Shipping crate workers	22.13
11	71	541 Employed in the coffee industry	22.29
12	71	391 Gas well sounder	22.29
13	71	922 Water treatment workers	22.29
14	72	563 Ceramics painters	22.45
15	72	445 Loom setters	22.45
16	73	427 Riveters	22.62
17	73	914 Foremen overseers	22.62
18	74	923 Machine operators outside of agriculture	23.11
19	75	751 Drivers	23.27
20	75	428 Coppersmiths	23.27
21	76	424 Mechanic - vehicles	23.44
22	77	752 Fare collectors	23.60
23	78	421 Metal planning & punch operators	23.77
24	78	452 Textile finishers	23.77
25	78	842 Elevator operators	23.77
26	79	725 Merchant marine sailors	23.93
27	80	518 Glaziers	24.09
28	80	415 Galvainers	24.09
29	80	429 Blacksmiths & locksmiths	24.09
30	81	404 Foremen in civil construction	24.26
31	81	412 Metal pressors & cutters	24.26
32	81	6 Employed in vegetation extraction or fishing	24.26
33	81	582 Forklift operators	24.26
34	82	431 Autobody workers	24.42
35	82	471 Sewing Assistant	24.42
36	83	814 Waiters	25.24
37	84	824 Manicurists & pedicurists	25.41
38	85	496 Electrical installation workers	25.57
39	86	589 Employed in other transformation industry jobs	25.73
40	87	487 Upholsterers & vehicle upholsterers	26.06
41	88	561 Glassworkers & ampule makers	26.23
42	89	746 Switchmen and signalmen	26.72
43	89	479 Purse and belt makers	26.72
44	90	473 Pattern makers & cutters	27.04
45	90	451 Textile printers	27.04
46	91	911 Apprentices	27.21
47	91	621 Magazine & newspaper vendors	27.21
48	92	272 Craftsmen	27.37
49	93	491 Electrical equipment assembly workers	27.70
50	94	604 Stock clerks	28.19
51	95	573 Gem cutters & polishers	28.36
52	95	498 Electrical wiring installation and repair workers	28.36
53	96	494 Radio & TV assembly workers	28.52
54	97	493 Equipment repairment	28.68
55	98	801 Proprietors	28.85

98	425	Mechanics	28.85
99	821	Hairdressers	29.01
99	423	Assembly adjusters	29.01
59	99	556 Bookbinding workers	29.01
60	100	495 Radio & TV repairmen	29.34
61	100	55 Dispatchers	29.34
62	101	572 Jewelers and watchmakers	29.50
63	102	422 Machine-tool operators	29.67
64	103	917 Sanitary inspectors	30.49
65	104	5 Non-specific agricultural and livestock owners	30.65
66	105	845 Office boy	30.98
67	106	4 Other livestock ranchers	31.14
68	107	602 Sales persons	31.31
69	108	403 Masters (chiefs & skilled) in textile industry	31.47
70	109	553 Printing engravers	31.80
71	110	492 Electronic equipment assembly workers	31.96
72	111	2 Cattle ranchers	32.29
73	111	554 Printing press operators	32.29
74	112	113 Other engineering occupations	32.45
75	112	274 Photographers	32.45
76	113	761 Transportation inspectors & dispatchers	32.78
77	114	275 Musicians	34.09
78	114	497 Telecommunication equipment installation & repair workers	34.09
	115	743 Locomotive engineers	34.26
	116	776 Telephone & telegraph linemen	34.42
	116	557 Other occupations in the graphic industry	34.42
82	116	418 Toolmakers	34.42
83	117	856 Policemen	34.59
84	118	276 Television, movie & legitimate stage actors	34.75
85	119	222 School proctors	34.91
86	120	741 Railway station agents	35.08
87	121	54 Stockroom and warehouse clerks	35.90
88	121	162 Nurses (no diploma)	35.90
89	121	552 Typographers	35.90
90	122	61 Operators of copying machines	36.55
91	123	281 Operatos of sound & lighting equipment	37.21
92	124	499 Operator of electrical energy installation	37.54
93	125	603 Cash register operators	37.70
94	126	571 Quality control inspector	38.19
95	127	167 Prosthetist	38.68
96	128	918 Inspectors	39.01
97	128	11 Hotelkeeper or boarding house owner	39.01
98	129	103 Surveyors	39.18
99	129	853 Officer in the fire corps	39.18
100	130	857 Jailkeeper, etc.	39.34
101	131	63 Receptionist	39.50
	131	36 Administrator of hotels	39.50
	132	852 Enlisted men in the armed forces	39.67
	133	831 Soccer player	39.83
105	134	775 Mail carriers	40.16

6	135	823	Make-up persons, etc.	40.49
7	136	774	Telephone operators	41.47
8	137	605	Product demonstrators	41.96
9	138	642	Real estate agents	42.62
10	139	62	File clerks	42.95
11	139	282	Other radio & TV operators	42.95
12	140	361	Gas & petroleum extraction workers	43.44
13	140	165	Operators of medical equipment	43.44
14	141	278	Announcers/commentators	43.77
15	141	271	Sculptors & painters	43.77
16	142	772	Postal clerks	44.26
17	143	646	Buyers	44.42
18	144	218	Vocational teacher	44.91
19	144	65	Office clerk	44.91
20	145	243	Process server	45.57
21	146	273	Decorator/scene designers	46.06
22	146	631	Salespersons	46.06
23	147	855	Police detectives	46.23
24	147	10	Merchant	46.23
25	148	112	Construction technician	46.39
26	148	9	Employed in civil construction	46.39
27	149	773	Telegraphers & radio telegraphers	46.55
28	150	56	Typists	46.72
29	151	645	Other agents & brokers	46.88
30	152	217	Nursery school teacher & kindergarten teacher	47.04
31	152	8	Employed in transformation industry	47.04
32	153	35	Administrator in trade & merchandizing	47.54
33	153	641	Insurance agents	47.54
34	153	402	Technicians in transformation industry	47.54
35	154	215	Elementary school teacher (1st-4th grade)	47.70
36	155	216	Elementary school teacher (1st-8th grade)	48.68
37	156	12	Transportation contractor	49.34
38	157	302	Agricultural & livestock technicians	49.50
39	158	60	Accounting aide	49.67
40	159	588	Security Supervisors	49.83
41	160	771	Postal & Telegraph Agents	50.16
42	161	163	Masseurs (medical)	50.32
43	161	64	Administrative aide	50.32
44	162	632	Commercial representatives	50.49
45	163	57	Teletype operator	51.31
46	163	251	Clergy	51.31
47	164	131	Chemical technician	51.47
48	165	59	Secretaries	51.96
49	166	168	Technicians in clinical analysis	52.29
50	167	406	Other masters/foremen	52.62
51	168	37	Administrators in transportation	52.95
52	168	58	Operator of automatic processing machines	52.95
53	169	405	Technician in electrical energy	53.11
54	170	3	Poultry farmer	53.44
55	170	244	Other auxiliary occupatin in the justice system	53.44
56	171	52	Administrative assistants	53.77
57	171	7	Employed in mineral extraction	53.77
58	172	40	Employee in charge of	

		administrative matters	54.09
172	219	Teacher	54.09
173	111	Draftsmen	54.42
151	173	53 Cashiers, bursars, tellers, pursers	54.42
162	174	13 Other proprietors	55.24
163	175	633 Publicity agents	55.41
164	176	242 Legal scribes & clerks	55.90
165	177	192 Statistical technicians	56.06
166	178	241 Notary publics	56.88
167	179	191 Accounting technicians	57.04
168	180	291 Librarians	59.83
169	181	854 Police chief or head	60.16
170	182	50 Revenue agents	61.31
171	183	834 Coaches	62.13
172	184	20 Ministers of State, etc.	62.45
173	185	643 Stock brokers	62.78
174	186	39 Other administrators	63.93
175	187	293 Other occupations	64.09
176	188	214 Middle school teacher (5-8th grades)	64.42
177	189	204 Social workers	66.55
178	190	154 Other health-related occupations	67.70
179	190	193 Computer programmers	67.70
180	191	33 Administrator in transformation industry	68.03
181	192	221 teaching orientator	68.52
182	193	21 Directors and consultants	68.68
183	194	182 Accountants	69.34
	194	711 Civilian aircraft pilots	69.34
	195	261 Writers & journalists	69.50
	196	279 Producers and directors of shows	70.32
187	197	34 Administrator in trade & merchandizing	70.98
188	197	153 Registered nurses	70.98
189	198	213 Secondary teacher	71.47
190	199	122 Pharmacists	74.75
191	200	38 Administrator in financial institutions	75.57
192	201	851 Officer in armed forces	76.39
193	202	152 Dentists	76.88
194	203	142 Biologists	77.04
195	204	121 Chemists	78.52
196	205	201 Sociologists, etc.	79.18
197	206	183 Administrative technicians	79.50
198	207	202 Psychologists	80.00
199	208	144 Veterinarians	81.96
200	209	181 Economists	83.77
201	210	102 Architects	83.93
202	211	141 Agronomists	84.26
203	212	173 Systems analysts	86.23
204	213	233 Lawyers, etc.	87.04
205	214	212 University processors	89.67
206	215	101 Engineer	93.44
207	216	151 Physicians	94.75
208	217	231 Judges	95.73
209	218	232 Attorneys, etc. (gov't. service)	100.00