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"The Measurement of Socioeconomic Status of Occupations in
Brazil--1982 PNAD: A Preliminary Note."

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DATA USED

- ☐ 1970 Census
- ☐ 1973 PNAD
- ☐ 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 "Symposion 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 adequated, 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	1982	
		Occ.	Occ.	
Group		Code	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 longshorement	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	Pastamakers	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 Galvinizers	24.09
29	80	429 Blacksmiths & locksmiths	24.09
	81	404 Foremen in civil construction	24.26
	81	412 Metal pressors & cutters	24.26
	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 prters	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
	96	494 Radio & TV assembly workers	28.52
	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	Operators 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
102	131	36	Administrator of hotels	39.50
103	132	852	Enlisted men in the armed forces	39.67
104	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 occupation 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
173	53	Cashiers, bursars, tellers, pursers	54.42
174	13	Other proprietors	55.24
175	633	Publicity agents	55.41
176	242	Legal scribes & clerks	55.90
177	192	Statistical technicians	56.06
178	241	Notary publics	56.88
179	191	Accounting technicians	57.04
180	291	Librarians	59.83
181	854	Police chief or head	60.16
182	50	Revenue agents	61.31
183	834	Coaches	62.13
184	20	Ministers of State, etc.	62.45
185	643	Stock brokers	62.78
186	39	Other administrators	63.93
187	293	Other occupations	64.09
188	214	Middle school teacher (5-8th grades)	64.42
189	204	Social workers	66.55
190	154	Other health-related occupations	67.70
190	193	Computer programmers	67.70
191	33	Administrator in transformation industry	68.03
192	221	teaching orientator	68.52
193	21	Directors and consultants	68.68
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
197	34	Administrator in trade & merchandizing	70.98
197	153	Registered nurses	70.98
198	213	Secondary teacher	71.47
199	122	Pharmacists	74.75
200	38	Administrator in financial institutions	75.57
201	851	Officer in armed forces	76.39
202	152	Dentists	76.88
203	142	Biologists	77.04
204	121	Chemists	78.52
205	201	Sociologists, etc.	79.18
206	183	Administrative technicians	79.50
207	202	Psychologists	80.00
208	144	Veterinarians	81.96
209	181	Economists	83.77
210	102	Architects	83.93
211	141	Agronomists	84.26
212	173	Systems analysts	86.23
213	233	Lawyers, etc.	87.04
214	212	University processors	89.67
215	101	Engineer	93.44
216	151	Physicians	94.75
217	231	Judges	95.73
218	232	Attorneys, etc. (gov't. service)	100.00