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RESEARCH NOTE

A Scale to Measure the Socioeconomic Status of Occupations in Brazil[1]

David B. Bills, Daramea S. Godfrey, and Archibald O. Haller
Department of Social Sciences, Illinois Institute of Technology, Chicago, Illinois 60616
Department of Rural Sociology, University of Wisconsin–Madison, Madison, Wisconsin 53706

ABSTRACT Empirical research on the processes of social stratification in developing nations has been hampered by the lack of adequate instrumentation and measurement procedures. This is particularly evident in the area of occupational status scaling, where a substantial measurement tradition has developed in industrialized nations. Drawing on this body of work, we use national data from the definitive 1973 PNAD survey of Brazil to construct an index of occupational status. The index, based on occupational education and income, is constructed using a multiple discriminant model. The index behaves in ways consistent with previous research and captures the specific features of Brazilian social stratification. We suggest a number of applications of the index.

Introduction

Latin America is perhaps the main region in which national stratification structures—partly influenced by extra-national factors, to be sure—are most clearly seen as sources of great social instability. Considering the practical importance attached to stratification in the region, as well as the substantial research capacities of Latin social scientists and research agencies, not to mention those of North American and European Latin Americanists, it is surprising that little exact information is available to provide precise descriptions of stratification in Latin American countries.

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This paper provides an analysis filling part of the gap. Specifically, it presents a socioeconomic index of the status (SEI) of occupations in Brazil, which we call the SIBO: The Socioeconomic Index of Brazilian Occupations. This scale may be of use to many researchers interested in Brazilian stratification and may provide a guide for those with similar interests in other countries. It was constructed as part of a larger project to analyze and explain the processes and structure of social stratification in Brazil (Bills *et al.*, forthcoming; Haller, 1982; Haller *et al.*, 1981; Pastore and Haller, 1982). Discriminant analysis of the education and income of Brazilian workers is used to provide status scores for 94 occupational categories covering each of the 264 specific occupations identified by the Brazilian government in its national household sample surveys.

Brazil, of course, does not constitute the whole of the region; neither is it in any sense "typical" of the region's nations. Each has its own characteristics. Nevertheless, with about 130 million people and 8.5 million square kilometers, Brazil is by far the largest nation south of the United States. Among the world's nations it has the fifth largest land surface, the tenth largest economy, and the sixth largest population (World Bank, 1984:218–23). Indeed, about three out of every 100 persons on the planet is a Brazilian. Given the size of Brazil and the importance of stratification phenomena in Latin America as a whole and in Brazil in particular, objective data on the nation's occupational status structure should be useful to Latin Americanists of all social science disciplines.

Background

After years of speculation—much of it enlightening, to be sure—empirical research on social stratification of a scope and quality permitting a rapid accretion of secure knowledge has emerged. This is due partly to theoretical and methodological improvements and partly to practical concerns. Several factors came together during the 1960s to make empirical research on stratification structures both more complete and more feasible than it had been. That decade saw the emergence of: (1) status attainment theory (Blau and Duncan, 1967; Sewell *et al.*, 1969); (2) the development of methods by which national occupational status structures could be measured (Duncan, 1961; Treiman, 1977a); (3) a clear specification of the basic phenomena of social hierarchies: power, privilege, and prestige in the words of Lenski (1966) or economic, political, social, and informational status in the words of Svalastoga (1964); and (4) a comprehensive delineation of the concepts describing variations of stratification structures: variations in average level, in dispersion, crystallization,[2] circulation mobility, and distributional contours (Duncan, 1968; Haller, 1970; Svalastoga, 1964). Also, during or just before that decade, several countries set up the national household sample survey systems needed to provide the data by which to measure stratification phenomena.

[2] The correlation of different status indicators.

Practical factors also came into play. Specifically, about the same time, many leaders and scholars concluded that high levels of social stratification cause large numbers of socioeconomic problems, such as injustice, poverty, inequality, class rigidity, etc. Stratification came to be seen as a source of many practical problems, and national stratification structures came to be seen as changeable. The occupational status of employed persons, their families, or their households is the main indicator through which such structures can be subjected to empirical analysis

The ranking of occupations in terms of status, prestige, or general standing has a long history in American sociology. This tradition, which dates back at least to the work of Counts (1925), was carried through in the work of Edwards (1943) and has finally culminated in the development and application of sophisticated quantitative scales measuring the socioeconomic status of occupations (Duncan and Hodge, 1963; Hauser and Featherman, 1977; Hodge *et al.*, 1964; Reiss, 1961; Siegel, 1971). Occupational status scales have been formulated for other developed societies (i.e., Blishen, 1958, 1967; Broom *et al.*, 1977; Ellery and Irving, 1972; Goldthorpe and Hope, 1974; Pineo and Porter, 1967; Taft, 1953; Treiman, 1977a). The utility of occupational status scales as tools for understanding processes of social stratification has been obvious to specialists since the 1950s (Sewell *et al.*, 1957) and has been evident to a much wider audience since Blau and Duncan's publication of *The American Occupational Structure* (1967). It is now widely understood that a clear, quantitative ranking of occupations along dimensions of socioeconomic status is a prerequisite to a wide variety of specific types of research on social stratification. While it has been persuasively argued that occupations are differentiated along several interesting theoretical and empirical dimensions (Gottfredson, 1979; Kohn and Schooler, 1973; Spaeth, 1976, 1979; Spenner, 1979), it is the hierarchical aspect of occupational status that is of central importance in stratification research.

Until recently it was not clear whether occupational status is best measured directly, by means of prestige indexes (Treiman, 1977a) or by composite socioeconomic status indexes (SEI). The occupational prestige tradition employs informants' reports of the "social standing" or "prestige" of occupational titles to determine hierarchies of occupational status. The SEI tradition uses composites of central tendencies of the income and education of each occupation to determine such hierarchies. The long history of occupational prestige scaling (Counts, 1925; Inkeles and Rossi, 1956; North and Hatt, 1947; Siegel, 1971) is perhaps the more consistent with classical thinking

regarding stratification (Weber, 1946). Yet, for present purposes there are at least two reasons for preferring the younger SEI tradition (Edwards, 1943)—which primarily grew out of the occupational prestige research tradition (Duncan, 1961). First, the available evidence on Brazilian occupational prestige hierarchies (Haller and Saraiva, 1972; Haller *et al.*, 1972; Hansen and Converse, 1976; Hutchinson, 1957, 1962) shows substantial variations among the occupational prestige hierarchies of different areas of the country, evidently linked to isolation (Haller *et al.*, 1972) and to educational status (cf. Hutchinson, 1957, with Haller *et al.*, 1972). If a national Brazilian occupational prestige hierarchy exists, it has yet to be shown. So, an alternative strategy would be preferable. For national, interregional, and interlocality analysis, it is necessary that an instrument whose structure clearly reflects the national socioeconomic system be constructed. SEI construction strategies employing nationally aggregated occupational income and occupational education data originally taken at the individual level on employed persons provide scales whose scores locate each individual in a unique and nationally comparable status level within the national stratification structure.

The second reason is that where their comparative validities have been assessed, SEI scales appear to have a higher lever of validity than do the best of the occupational prestige scales (Siegel, 1971; Treiman, 1977a). In an important statement on the issue, Hauser and Featherman (1977) demonstrate convincingly that occupational inequality in the United States may be measured most precisely with SEI indexes. Drawing on a wide range of data, particularly that of Siegel (1971), Hauser and Featherman show the clear dominance of occupational education and income as determinants of socioeconomic status.

Previous scaling of Brazilian occupations

The only nationally representative scale of Brazilian occupations available to date was developed by Silva (1973), although there have been several limited scales developed (Castaldi, 1956; Haller *et al.*, 1972; Hutchinson, 1957, 1962). The Silva scale is the only one designed to measure occupational status for the nation as a whole. Though the analytical scheme is not entirely clear to us, it appears to be an occupational income scale standardized by age and education. The scale reported herein utilizes both education (occupational *requirements*) and income (occupational *rewards*) as the basic components of occupational socioeconomic status. This is consistent with most such research today.[3]

[3] Explicit comparisons of the present scale with that of Valle are presented more fully in Kelley and Bills (1980).

Procedure

The data for the present report come from the 1973 *Pesquisa Nacional por Amostra de Domicilios* (National Sample Survey of Households) survey of Brazil, hereafter referred to as PNAD 73. This is a representative national sample of households; we use the labor force data-tape compiled from it, which includes all persons over 10 years of age in each household (N = 272,212). The interviewing was conducted during the third trimester of 1973 by the *Instituto Brasileiro de Geografia e Estatística* (IBGE), the Brazilian census bureau. Only non-institutionalized individuals were sampled. The quality of the data is exceptionally high. Respondents were required by law to answer the survey questions and were carefully protected against the possibility that answers might be used against them. By any criterion, IBGE took great care in the collection and compilation of data, using widely accepted and validated procedures, and the data seem to be on a par with the best of those generated anywhere.

PNAD 73 categorizes responses to the question "What was your occupation last week?" into 264 discrete occupational categories. Even in a sample as large as this, such a detailed classification results in prohibitively small numbers of cases with which to perform reliable scaling procedures for each and every occupation. It was therefore necessary to aggregate these 264 occupations in some way that both preserved sufficient detail and allowed large enough cell sizes to make sensible comparisons. We arrived at a satisfactory classification through a two-stage procedure.

In the first stage, each occupational title was interpreted by comparing it with the *Brazilian Dictionary of Occupations (Classificação Brasileira de Ocupações* (CBO), Ministério do Trabalho, 1977). Although the CBO is a more detailed (and nation-specific) listing, it is intended to be compatible with the *International Standard Classification of Occupations* (ISCO), compiled and published by the International Labour Organization (1968). The CBO, like the ISCO classification after which it was patterned, employs a four-part structure.

Occupations are first classified under 11 major headings (referred to as "*Grandes Grupos*" in the CBO and as "Major Groups" in the ISCO classification), which "represent very broad fields of work rather than specific types of work performed" (ISCO, 1968:3). These broad fields include:

(0/1)	Professional, Technical, and Related Workers
(2)	Administrative and Managerial Workers
(3)	Clerical and Related Workers
(4)	Sales Workers
(5)	Service Workers

(6) Agricultural, Animal Husbandry, and Forestry Workers, Fishermen, and Hunters
(7/8/9) Production and Related Workers, Transport Equipment Operators, and Labourers
(X) Members of the Armed Forces

Under these broad field classifications are found the "Minor Groups" (ISCO) or "*Subgrupos*" (CBO), which generally link categories with common occupational characteristics (i.e., Medical Doctors, Medical Assistants, Dentists, Dental Assistants, and Veterinarians). The ISCO reports 83 headings at this level of classification, while the CBO specifies 86 (three are found under the major heading of Armed Forces). These secondary categories are further divided into "Unit Groups" (ISCO) or "*Grupos de Base*" (CBO), which group occupations that are "related to each other by similarity of the characteristics of the work they entail" (ISCO, 1968:4). Finally, individual occupations are listed under each Unit Group or *Grupos de Base* heading.

In this analysis, we employ the "Minor Groups" or "*Subgrupos*" category of this system. Eighty-two aggregations of occupations were produced under this heading.

In the second stage of our procedure, analysis of these 82 groups showed them to be largely homogeneous with respect to both levels and distribution of education and income. Where exceptions were observed (e.g., often in categories falling under the title of "not elsewhere classified"), occupations were disaggregated. Thus, 82 CBO categories were expanded to a total of 94. Extensive work with these categories convinced us that they are both homogeneous enough and detailed enough to permit them to be rank-ordered in terms of socioeconomic status. Cell sizes are small in only a few cases. The model we adopted assumes only that each cell contains at least two observations (Klecka, 1982:11). This, along with our observation that in no instance did a deviant case produce a misallocated occupation, obviated the need to combine titles.

The model chosen to scale occupations is that of multiple discriminant analysis. The procedure employed is a fairly straightforward extension of a scheme applied by Kelley (n.d.), based on a prestige classification developed by Treiman (1977a). The present scheme differs from Kelley's in several ways. First, he used only 15 broad groups of occupations, while we employ 94. Second, Kelley averaged occupational status scores across a number of countries to develop a metric for comparative analysis. We do not, because we are interested in developing a system that captures the unique features of the Brazilian occupational stratification structure. Third, which is explained in more detail below, the present system employs only two discriminating variables, education and income, while Kelley's scheme adds father's occupation. In general, the difference is not consequential.

Finally, the present subset of the sample consists of both men and women aged 15–64, while Kelley's employs only men aged 20–64.

The analytical subsample consists of all men and women aged 15–64 who reported that they were gainfully employed during the week in which they were interviewed. This resulted in a sample size of 113,542. It is unusual in such research to include women in the construction of occupational scaling schemes, which generally consider only the occupational status of men. The objective is to represent the Brazilian labor force as fully and accurately as possible, which can only be accomplished by including all remunerated workers.[4]

The idea behind multiple discriminant analysis (e.g., Klecka, 1982) is a simple one. First, each of the 94 occupational categories is specified as a dummy variable.[5] Each of these categories, in effect, becomes a variable. The variables in the Y set are generally referred to quite simply as "groups." The canonical procedure then expresses these groups as a discriminant function of some number of "discriminating variables." Following standard procedures (Featherman and Hauser, 1978), the mean educational level and the mean level of income for each of the 94 occupational categories were selected as discriminating variables.[6,7] The procedure serves to maximize the ordinary product-moment correlation between the 94 occupational groups and a canonically weighted composite of education and income. As such, it is

[4] Brazilian women earn considerably less than men and often have more education for comparable occupations, which might suggest that we develop different indexes for men and women. Unfortunately, such an approach would preclude any subsequent comparative study of the stratification processes of men and women. Using a common metric for men and women does not assume that the processes of stratification are the same but, rather, that calibration should be. Treiman (1977b) provides a convincing discussion of the need for standardization. See also Treiman and Terrell (1975) on using a single scale for men and women.

[5] The discriminant function model is quite similar to the canonical correlation model in which a set of variables (rather than the categories of a single variable) is correlated with a second set of variables.

[6] The discriminant analysis model we used assumes that the discriminating variables have a multivariate normal distribution and that they have equal variance-covariance matrices within each group. Klecka (1975:435) points out that "In practice, the technique is very robust and these assumptions need not be strongly adhered to." To approximate more fully this assumption, in a parallel analysis we used the natural logarithm of income rather than metric income as a discriminating variable and obtained practically identical results.

[7] In another parallel analysis, we employed a fuller set of discriminating variables, including (along with education and income) age, hours worked per week, whether the respondent held a *carteira* (a work-employment card), whether the respondent regularly worked 40 or more hours per week, years of experience in the occupation, and class position (a variable indicating whether the respondent was self-employed and employed other people). In even our most stringent tests, using both Wilks' lambda and the standardized discriminant function coefficients as criteria, education and income emerged as the major determinants of occupational status.

a straightforward extension of the general linear model, extended to multiple dependent variables.[8]

The resulting discriminant function accounts for 84 percent of the variance in occupational status, which is highly significant at any conventional level. The corresponding canonical correlation is .765, with an eigenvalue of 1.41. These statistics appear to indicate that education and income are sufficient to capture the socioeconomic dimension of occupational status.

Consistent with most recent occupational scaling, we find that education contributes more to the discriminant function than does income. For instance, the standardized canonical discriminant function coefficient is .934 for education and .185 for income.[9] Similarly, the pooled within-groups correlation between the canonical discriminant function and the discriminating variables is .984 for education and .439 for income. While using the logarithm of income rather than metric income as a discriminating variable tends to decrease somewhat the contribution of education while increasing somewhat the contribution of income, the change is not large, and the resultant ranking of occupations is virtually unaltered. Further, the Wilks' lambda statistic indicates that both education and income are making very significant contributions to the discriminant function (ed = .421, $F = 1{,}717$; income = .671, $F = 611$). In any case, previous research has consistently shown occupational status to be more highly correlated with education than with income (see, for example, Featherman and Hauser, 1978). While this does not automatically prove that the present specification is the only appropriate one, the results are clearly consistent with those observed in a long history of occupational scaling research.

For present purposes, the most important statistics obtained from the canonical procedure are the "group centroids." As explained above, the discriminant model produces a function that maximizes the relationship between the Y (occupation) and X (education and income) variables. A centroid is the mean on this function for a given group. Klecka defines a group centroid quite succinctly as "the most typical location of a case from that group in the discriminant function space" (Klecka, 1975:443). To translate this into more pertinent terms, "the most typical location of an employed individual from that occupation in the socioeconomic hierarchy of occupations."

Because group centroids have no natural metric and are as likely to be negative as positive, we standardized them into a 0–100 metric.[10]

[8] Excellent expositions of discriminant analysis include Cooley and Lohnes, 1962; Huberty, 1975; Klecka, 1982; Lachenbruch, 1975; and Tatsuoka, 1971.

[9] This statistic, comparable to a beta weight in multiple regression analysis, represents the relative contribution of each variable to the discriminant function.

[10] Actually, they were standardized to a 0.001–100.000 metric to avoid the inevitable problems created by zeros vis-à-vis missing data, nonlinear transformations, etc.

This simple linear transformation has no effect on the relationship of occupational status with other variables but simply serves to make them more interpretable.

The resulting scores thus constitute the Socioeconomic Index of Brazilian Occupations (SIBO). Table 1 presents the scale, along with other descriptive information.

Even a cursory inspection of Table 1 suggests that the SIBO has substantial face validity. All of the occupations at the top of the hierarchy (i.e., those with scores above 80) are the kinds of professional positions generally associated with high socioeconomic status and/or prestige. Scores on the next level, those in the approximate range of 40 through 80, are generally white-collar occupations and seem to be ranked in a manner that accords well with common sense. Below these levels, occupations start to shade from white-collar to blue-collar positions, again in a very logical way. Many of the very lowest occupations are agricultural, which is hardly surprising to anyone familiar with the Brazilian stratification system. One consequence of the analysis may, however, be surprising to Brazilianists, at least initially. Those who know Brazil well will recall that in 1973 the top of the hierachy is believed to have been composed largely of industrialists, large-scale farmers (*fazendeiros*), and military officers. Yet, the average person in each of these occupations has a SIBO status far removed from the pinnacle. The "inconsistency" is more apparent than real: it is entirely possible that the zenith is indeed well populated with persons of these three occupations but that the average status for *all* persons in each of these is modest. Only a few industrialists are tycoons; only a few *fazendeiros* are powerful; only a few military officers are upper elites.

Table 2 presents the correlations of the SIBO with a number of other relevant variables. These correlations were calculated separately for men and women. In addition to the obvious inclusion of education and income, we include variables indicating farm status, class position,[11] and the natural logarithm of income. We also include the occupational status of the respondent's first job and the occupational status of the respondent's father.

We are not interested here in providing substantive interpretations of these correlation matrices but only in presenting evidence regarding the concurrent validity of the scale. Indeed, the entries all seem quite reasonable, providing about the kinds of results one would expect from any prior knowledge of Brazil. Occupational status cor-

[11] This measure is discussed more fully in Bills *et al.*, forthcoming. It refers to individuals who are both self-employed and who employ other people. We consider these people to be capitalists and contrast them both with employees and with self-employed persons who have no employees. We believe this operational definition of the crucial distinction between capitalists and workers to be fully consistent with Marx and with the legal definition used by the Soviet Union and most other Marxist governments.

Table 1. Occupational status scale (SIBO) and accompanying descriptive information

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
101	Engenheiros	Engineers	100.000	16.22	0.69	11,832	6,900	282
102	Arquitetos	Architects						
114	Geologos	Geologists						
161	Magistrados	Judges	97.901	15.90	1.94	11,628	5,475	23
162	Procuradores, Promotores e Curadores	Legal Officers (Gov't. Service)	94.495	16.25	0.51	8,214	6,190	264
163	Advogados e defensores	Lawyers						
123	Naturalistas[a]	(Naturalists)	92.076	16.30	0.00	6,480	4,622	3
121	Agronomos	Agronomic Engineers	91.635	16.07	1.45	7,001	3,754	41
153	Professores Superiores	University Professors	91.544	16.18	0.51	6,558	4,842	117
145	Sociologos	Sociologists	88.668	16.30	0.00	4,306	3,063	5
122	Veterinários	Veterinarians	87.543	15.38	3.15	6,828	5,458	446
130	Medicos	Medical Doctors						
131	Dentistas	Dentists						
143	Economistas	Economists	85.000	16.30	0.00	7,908	3,316	51
111	Químicos	Chemists	83.089	14.00	3.54	8,897	6,956	42
113	Físicos	Physicists						
115	Astrônomos	Astronomers						
043	Programadores	Computer Programmers	72.901	13.02	3.08	5,831	5,690	59
141	Matemáticos	Mathematicians						
142	Estatísticos	Statisticians						
022	Administradores de Bancos e Companhias de Seguro	Administrators of Banks and Insurance Companies	71.170	12.37	3.24	7,047	5,936	336
144	Contadores	Accountants	70.153	12.97	2.20	4,259	3,968	389

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
171	Religiosos	Priests, Ministers and Other Clergical Personnel	67.593	13.14	4.82	2,029	2,282	30
041	Intérpretes e Tradutores	Interpretors and Translators	66.031	12.70	3.92	2,582	2,278	106
042	Bibliotecários e Documentaristas	Librarians						
172	Assistentes Sociais	Social Workers						
173	Agentes Sociais	Social Agents						
711	Aviadores Civis	Civil Aircraft Pilots	63.283	10.18	2.82	9,744	8,041	11
040	Radatores	Editors	62.029	11.73	3.96	3,453	3,449	84
181	Escritores e Jornalistas	Writers and Journalists						
194	Locutores	Announcers, Radio and Television						
021	Adm. Servico Público	Public Service Administrators	61.712	11.41	4.18	4,388	4,594	1,383
031	Agentes Fiscais	Tax Auditor (Gov't. Service)						
032	Inspetores de Trabalho	Labor Inspectors (Gov't. Service)						
164	Tabeliões[a] e Oficiais de Registro	Notary Publics and Registry Officials						
165	Escrivães e Auxiliares	Legal Recorders and Auxiliary Workers						
843	Delegados e Comissários de Polícia	Chiefs of Police and Police Commissioners						
112	Farmaceúticos	Pharmacists	61.153	11.84	4.94	2,510	2,750	123
133	Enfermeiros Diplomados	Registered Nurses						
135	Fisioterapistas	Physical Therapists						
137	Operadores Raio X	X-Ray Operators						
151	Professores Primários	Elementary School Teachers	56.433	11.34	3.73	1,289	1,545	3,772
152	Professores Secundários	High School Teachers						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
154	Professores sem Capacitizição	Teachers (untrained)						
155	Inspetores de Ensino	School Instruction Supervisors						
156	Inspetores de Alunos	School Proctors						
033	Oficiais e Técnicos de Administração	Officials and Administrative Technicians	56.000	11.90	3.71	3,110	3,254	194
044	Operadores	Computer Operators	53.891	10.69	2.77	1,955	1,367	115
024	Outros Administradores	Other Administrators	51.842	9.54	4.33	4,710	5,542	1,991
038	Datilógrafos	Typists	47.573	9.70	3.00	1,427	1,599	534
039	Taquígrafos	Stenographers						
036	Técnicos de Contabilidade	Accounting Technicians	46.219	9.20	3.76	2,317	2,301	715
104	Desenhistas	Designers, Draftsmen						
139	Laboratoristas	Laboratory Technicians						
211	Técnicos Agrícolas e Práticos Rurais	Agricultural Technicians						
492	Radiotécnicos	Radio Technicians						
918	Observadores Meteorológicos	Meteorological Observers						
037	Almoxarifes	Stock Control Clerks	44.851	9.20	3.21	1,467	1,294	6,810
045	Auxiliaries de Escritorio	Auxiliary Office Workers						
034	Coletores e Exatores	Tax Collectors (Gov't. Service)	43.976	8.90	3.36	1,952	2,196	750
035	Caixas e Tesoureiros	Bursars, Pursers, Treasurers and Cashiers						
772	Postalistas	Postal Clerks						
776	Vendedores de Selos	Postage Stamps Sales Clerks						
635	Compradores	Buyers	43.582	8.35	4.16	3,637	2,740	39
841	Oficiais e Praças das Forças Armadas	Officers and Enlisted Men of the Armed Forces	42.433	8.41	3.90	2,719	2,677	1,469

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
621	Pracistas e Viajantes Comerciais	Travelling Salesmen	41.757	8.00	3.65	3,727	3,860	775
622	Representantes Comerciais	Commercial Representatives						
623	Propagandistas	Sales Promoters, Publicity Agents						
631	Corretores de Seguros	Insurance Agents	41.310	7.85	3.99	3,971	4,503	267
632	Corretores de Imoveis	Real Estate Agents						
633	Corretores de Títulos e Valores	Stock Brokers						
634	Outros Agentes Corretores	Other Agents and Brokers						
831	Jogadores de Futebol	Soccer Players	39.274	7.68	3.78	3,286	6,349	29
832	Lutadores e Outros Atletas	Wrestlers and Other Professional Athletes						
833	Juizes de Esporte	Sports Referees, Judges						
834	Técnicos de Esportes	Coaches						
014	Industriais	Owners and General Mgrs. of Manufacturing Plants	38.960	7.04	4.62	5,368	5,437	687
773	Telegrafistas e Radiotelegrafistas	Telegraphers and Radiotelegraphers	38.458	8.07	3.08	1,371	882	284
774	Telefonistas	Telephone Operators						
016	Hoteleiors e Donos de Pensao	Hotel and Boarding House Owners	37.557	6.86	4.73	5,067	5,514	449
017	Outros Proprietários	Other Proprietors						
116	Meteorologistas	Meteorologists	37.080	7.67	3.54	1,919	1,908	6
103	Agrimensores	Surveyors	36.163	7.37	4.38	2,385	2,454	147
192	Músicos	Musicians	33.273	7.05	3.89	1,653	1,682	102
193	Artistas de Cinema, Teatro, etc.	Actors, Movie and Theater						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
132	Parteiras	Midwives	32.991	7.12	3.14	1,236	1,172	780
134	Enfermeiros não Diplomados	Practical Nurses						
138	Práticos de Farmácia	Practical Pharmacists, n.e.c.						
914	Guardas Sanatários	Sanitary Inspector (Gov't. Service)	31.592	6.69	3.74	1,876	2,001	442
915	Inspetores Fiscais	Fiscal Inspectors (Gov't. Service)						
191	Escultores e Pintores	Sculptors and Painters	30.468	6.46	3.47	1,982	2,057	258
195	Decoradores e Cenógrafos	Decorators and Scene Designers						
196	Cinegrafistas e Operadores	Cinematographers and Camera Operators						
197	Fotógrafos	Photographers						
198	Outros Técnicos de Cinema, Teatro, etc.	Other Movie Technicians						
721	Oficiais de Marinho Mercante	Officers of the Merchant Marine	30.354	6.08	3.25	3,227	2,666	12
551	Linotipistas	Lineotypists	28.064	6.18	2.72	1,437	1,246	347
552	Tipógrafos	Typographers						
553	Clicheristas e Gravadores	Printing Engravers						
554	Impressores	Printing Press Operators						
555	Revisores, na Industria Gráfica	Proof Readers, Graphics						
556	Encadernadores e Cartonadores	Bindery Workers						
557	Outras Ocupações na Industria Gráfica	Other Occupations in the Graphics Industry						
775	Carteiros	Postal Deliverymen (Gov't. Service)	27.152	6.11	2.32	1,104	488	85
741	Agentes de Estradas de Ferro	Railway Station Agent	27.046	5.93	2.67	1,641	589	69
742	Condutores e Chefes de Trem	Conductors and Train Attendants						
771	Agentes Postais e Telegráficos	Postal and Telegraph Agents (Gov't. Svc.)						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
572	Ourives e Relojoeiros	Jewelers and Watch Repairers	23.231	5.34	2.75	1,298	906	115
573	Lapidores	Gem Cutters and Polishers						
491	Electricistas	Electricians	22.817	5.18	2.93	1,609	1,650	990
777	Guarda-fios	Telephone and Telegraph Linemen						
511	Mestres de Obras	Foremen (First Line Supervisor)	22.703	4.88	2.91	2,593	2,432	524
571	Mestres e Contramestres	Foremen and Straw Bosses						
015	Comerciantes	Merchants	22.521	4.82	3.58	2,689	3,239	4,151
136	Protéticos	Dental Prosthesis Makers	22.306	5.12	2.63	1,506	1,217	2,381
424	Mecanicos de Motor a Explosão	Mechanics, Internal Combustion Engines						
425	Mecanicos, sem Especificação	Mechanics, n.e.c.						
917	Lubrificadores	Lubricators						
612	Vendedores Ambulantes	Street Vendors	21.243	5.09	3.02	938	973	5,190
613	Balconistas e Entregadores	Sales Clerks and Delivery Men						
614	Vendadores de Jornais e Revistas	Newspaper and Magazine Vendors						
414	Afiadores e Amoladores	Tool Grinders and Sharpeners	21.224	4.93	2.42	1,465	1,023	804
421	Estampadores Mecânicos	Stamping Machine Operators						
422	Fresadores e Furadores	Metal Planning and Punch Operators						
423	Torpeiros Mecânicos	Machine Tool Operators						
429	Ferreiros e Serralheiros	Iron Workers, Locksmiths						
433	Ferradores	Blacksmiths						
752	Trocadores	Fare Collectors (Public Transp.)	19.659	4.80	2.25	958	680	383
761	Inspetores e Despachantes de Transporte	Traffic Inspectors and Dispatchers						
821	Barbeiros e Cabeleireiros	Barbers and Beauticians	19.471	4.73	2.68	1,058	913	629

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
822	Manicures e Pedicures	Manicurists and Pedicurists	18.626	4.57	2.91	1,107	719	15
919	Operadores Cinematográficos	Cinema Projectionists	18.470	4.47	2.54	1,361	909	164
411	Modeladores e Formistas de Metais	Metal Shapers and Molders						
412	Fundidores de Metais	Metal Foundry Workers						
413	Laminadores e Trefiladores	Metal Cutters and Drawers						
426	Galvanizadores e Niqueladores	Galvanizers and Nickelplaters						
585	Embaladores e Expedidores	Packagers and Shipping Clerks	17.664	4.50	2.42	717	422	691
722	Mestres de Embarcação	Boatswains	17.467	4.17	2.38	1,777	1,644	4,641
723	Maquinistas de Embarcação	Ship's Machinists						
724	Foguistas de Embarcação	Marine Firers						
725	Marinheiros Civis	Merchant Marine Sailors						
727	Barqueiros e Canoeiros	Small Boat Operators						
743	Maquinistas	Locomotive Engineers						
744	Foguistas de Trem	Train Firemen						
745	Guarda-Freios	Railroad Brakemen, Flagmen						
746	Manobreiros e Sinaleiros	Switchmen and Signalmen						
751	Motoristas	Drivers (Pub. Transp. and Trucking)						
753	Carroceiros e Tropeiros	Teamsters (oxen, horses, etc.), Cart Drivers						
481	Marceneiros	Cabinetmakers	16.866	4.22	2.32	1,192	812	705
483	Tanoeiros	Coopers, Barrelmakers						
487	Lustradores de Madeira	Wood Polishers						
522	Operadores de Maquinas de Construção Civil	Machine Operators, Civil Construction	16.639	4.17	2.59	1,240	855	1,034
731	Guindasteiros	Port to Ship Crane Operators						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
732	Estivadores	Stevedores and Longshoremen	16.213	4.20	2.75	869	811	1,003
920	Operadores de Máquinas	Machine Operators, n.e.c.						
474	Chapleiros Exclusive de Palha	Hatmakers (not straw)						
575	Fogueteiros	Firecracker Makers						
576	Cesteiros e Esteireiros	Basketmakers and Mat Weavers						
577	Vassoureiros	Broommakers						
583	Artífices sem Especificação	Craft Workers, n.e.c.						
586	Outras Ocupações Industria de Transformação	Other Occupations in Manufacturing						
912	Aprendizes	Apprentices						
461	Correeiros e Seleiros	Leather Goods, Saddle and Harness Makers	16.009	4.18	2.31	802	805	684
475	Sapateiros	Shoemakers						
476	Bolseiros e Cinteiros	Purse and Belt Makers						
427	Soldadores	Solderers and Welders	15.849	3.99	2.19	1,363	936	1,157
428	Caldeireiros	Boilermakers						
430	Lanterneiros de Veiculos	Auto Body Workers						
431	Rebitadores de Metais	Metal Riveters						
432	Funileiros de Metais	Tinsmiths						
418	Encanadores	Plumbers and Pipefitters						
582	Operarios de Reparo e Construção Naval	Shipwrights						
580	Polidores e Esmerilhadores	Buffers and Polishers	15.509	3.95	1.75	1,303	1,508	117
842	Oficiais e Praças do Corpo de Bombeiros	Officers and Enlisted Men in the Fire Fighters Corps	15.429	4.07	2.76	870	655	5,038
844	Investigadores de Polícia	Police Detectives						
845	Guarda-civis e Inspetores de Tráfego	Policemen (and Traffic Policemen)						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
846	Carcereiros e Guardadores de Presídio	Jailers and Prison Guards						
847	Datiloscopistas	Fingerprint Experts						
921	Porteiros, Vigias e Serventes	Doormen, Watchmen and Janitors	15.112	4.02	2.45	794	620	1,488
712	Aero-Mocos	Airline Stewards/Stewardesses						
726	Taifeirós	Ship's Stewards						
811	Cozinheiros	Cooks						
812	Garções	Waiters						
515	Pintores e Caiadores	Painters and Whitewashers	15.092	3.90	2.21	1,179	785	929
581	Pintores a Pistola	Spray-painters						
471	Alfaiates e Costureiros	Tailors and Seamstresses	14.596	3.98	2.48	624	600	3,402
472	Bordadeiras e Cerzideiras	Embroiderers and Reweavers						
473	Chapelheiros de Palha	Hatmakers (straw)						
485	Estofadores e Capoteiros	Upholsterers and Vehicle Upholsterers						
486	Colchoeiros	Mattressmakers						
441	Cardadores e Penteadores	Textile Cutters and Combers	12.975	3.67	2.43	688	912	1,082
442	Macaroqueiros, Bobinadores, etc.	Textile Rovers						
443	Fiandeiros	Textile Spinners						
444	Rendeiros	Lacemakers						
445	Urdidores e Remetedores	Textile Loom Warp and Thread Setters						
446	Cordoeiros	Ropemakers						
447	Teceloes	Weavers						
448	Tapeceiros	Tapestry and Carpet Weavers						
449	Redeiros	Net Makers						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
450	Alvejadores e Tintureiros	Textile Bleachers and Dyers						
451	Estampadores Texteis	Textile Printers						
452	Acabadores de Pano	Textile Finishers						
611	Açougueiros	Butchers	12.907	3.62	2.30	817	500	133
023	Administradores na Agropecuária	Agricultural Administrators	12.644	3.45	3.02	1,268	1,869	330
913	Capatazes	Foremen, Overseer						
574	Vulcanizadores e Recauchutadores	Vulcanizers and Tire Repairmen	12.615	3.48	1.92	1,113	761	126
462	Curtidores	Tanners	12,476	3.56	2.89	733	604	24
011	Agricultores	Farmers, Agriculturalists	10.915	2.90	2.65	2,087	3,231	3,402
012	Pecuaristas	Livestock Ranchers						
013	Avicultores e Criadores	Poultry Famers and Breeders						
221	Chacareiros, Hortelões e Floricultores	Small Farmers, Horticulturists, Floriculturists						
584	Foguistas (excl. embarcação e de trem)	Firers (excluding those on ships and trains)	9.985	3.09	1.89	1,076	595	44
212	Aradores	Plowmen	9.911	3.00	1.86	1,072	990	501
213	Tratoristas	Tractor Operators						
813	Empregados Domesticos	Domestic Servants	9.636	3.16	2.19	342	232	7,286
482	Carpinteiros	Carpenters	9.148	2.85	1.94	1,134	591	4,591
512	Armadores de Concreto	Reinforced Concretors						
513	Pedreiros	Bricklayers						
516	Estucadores	Stucco Masons						
517	Ladrilheiros e Taqueiros	Tilers and Parquetry Workers						
519	Vidraceiros	Glaziers						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
520	Calceteiros e Asfaltadores	Sidewalk and Street Paving Workers						
521	Calafetes	Flooring Fitters, Caulkers						
578	Marmoristas	Marble Workers, Construction	8.868	2.89	2.09	814	725	238
484	Serradores	Sawyers	8.635	2.88	2.25	713	342	292
911	Ascensoristas	Elevator Operators						
916	Lixeiros	Garbagemen	8.254	2.81	2.22	714	548	867
531	Linguiceiros e Salsicheiros	Sausage Makers						
532	Charqueadores	Jerkeymakers						
533	Magarefes	Butcher (slaughterhouse)						
534	Manteigueiros e Queijeiros	Butter and Cheesemakers						
535	Doceiros e Confeiteiros	Candymakers and Confectioners						
536	Macarroneiros e Pasteleiros	Pastamakers						
537	Padeiros	Bakers						
538	Farinheiros e Moleiros	Flour Merchants and Millers						
539	Ocupações das Usinas e Engenhos	Sugarmill Workers						
540	Ocupações das Destilarias de Bebidas	Alcoholic Beverage Distillery Workers						
541	Ocupações de Moagem e Torrefação de Cafe	Coffee Grinding and Roasting Occupations						
824	Engraxates	Shoeshiners	7.890	2.84	1.99	369	285	34
514	Serventes de Pedreiros	Hodcarriers	7.089	2.60	2.09	699	369	5,415
762	Trabalhadores Concervação de Rodovias	Highway Road Repairmen						
763	Trabalhadores Concervação de Ferrovias	Railroad Track Workers						

Table 1. (Continued)

PNAD code	Occupational title (Portuguese)	Occupational title (English trans.)	Occupational status score	$\overline{ED}$	σ_{ED}	$\overline{INC}$	σ_{INC}	PNAD N
922	Trabalhadores Braçais, sem Especificação	Manual Laborers, n.e.c.						
231	Caçadores	Hunters	6.782	2.50	*	857	*	1
222	Jardineiros	Gardeners	6.570	2.51	2.11	679	395	282
311	Mineiros	Miners	5.668	2.24	1.06	1,067	1,398	357
321	Canteiros e Marroeiros	Stone Cutters and Rock Drillers						
331	Trabalhadores Extração de Petroleo e Jazidas	Petroleum Extraction Workers						
341	Garimpeiros	Prospectors						
561	Vidreiros e Ampoleiros	Glasscutters and Ampoule Makers	4.675	2.20	2.10	581	402	465
562	Ceramistas e Louceiros	Ceramists and China Makers						
563	Pintores Ceramicos	Ceramics Painters						
564	Oleiros	Potters, Brick and Tile						
224	Trabalhadores de Pecuaria	Livestock Farm Workers	3.713	1.98	2.01	725	945	2,039
232	Pescadores	Fishermen	2.750	1.82	1.73	679	551	404
542	Ocupações da Industrialização do Pescado	Fishing Industry Occupations						
823	Lavadeiras e Engomadeiras	Clothes Washers and Starchers	1.469	1.70	1.84	294	241	2,118
241	Madeireiros e Lenhadores	Lumberjacks and Sawmill Workers	1.242	1.54	1.81	729	1,017	464
242	Carvoeiros	Charcoal Makers						
243	Seringueiros	Rubber Tree Tappers and Collectors						
244	Ervateiros	Herb Gatherers						
223	Trabalhadores de Enxada	Hoemen	0.947	1.53	1.68	571	663	21,875
245	Apanhadores, Descascadores, etc.	Gatherers, Pickers and Peelers						
579	Charuteiros e Cigarreiros	Cigar and Cigarette Makers	0.001	1.41	1.25	398	519	16

[a] Not strictly translatable.

Table 2. Means, standard deviations, and zero-order correlations of major variables

	Mean $\bar{x}$	Standard deviation	Occupational status (SIBO)	Education[1]	Income (U.S. dollars of 1973)	Log_n income	Farmer[2]	Class[3]	Occupational status, 1st job (SIBO)	Father's occupational status (SIBO)
Men										
Occupational status (SIBO)	16.74	18.07	1.00							
Education	4.20	3.86	.729	1.0						
Income	1,625.00	2,665.00	.496	.517	1.0					
Log_n income	6.84	.97	.544	.543	.756	1.0				
Farmer	.37	.48	−.596	−.428	−.187	−.369	1.0			
Class	.07	.27	.063	.045	.212	.261	.072	1.0		
Occupational status of first job (SIBO)	10.08	13.86	.663	.680	.410	.413	−.437	.003	1.0	
Father's occupational status (SIBO)	8.71	13.70	.520	.558	.390	.358	−.348	.027	.605	1.0
Women										
Occupational status (SIBO)	18.50	19.53	1.0							
Education	4.63	4.28	.801	1.0						
Income	759.00	1,139.00	.452	.475	1.0					
Log_n income	6.14	.95	.597	.609	.726	1.0				
Farmer	.26	.44	−.527	−.418	−.143	−.240	1.0			
Class	.009	.13	.030	.107	.214	.154	.024	1.0		
Occupational status of first job (SIBO)	16.11	18.63	.869	.797	.407	.549	−.470	.009	1.0	
Father's occupational status (SIBO)	9.87	14.93	.563	.586	.349	.422	−.341	.018	.591	1.0

[1] Estimated year-equivalents.
[2] Farmer = 1, all others = 0.
[3] Capitalists: self-employed employers = 1, all others = 0.

relates highly with both educational attainment and level of income,[12] and has a substantial negative correlation with farm status. It is generally unrelated to class position as expected (cf. Bills *et al.*, forthcoming). Its correlation with occupational status of the respondent's first job and with father's occupational status both give intuitively plausible estimates varying upwards of $r = .50$. In short, the scale behaves as would be expected, given any reasonable assumptions about social stratification in Brazil.

Conclusion

We believe that we have offered an index with sufficient reliability and validity to help advance our understanding of Brazilian social stratification. The SIBO scale is intended to function both as a dependent and independent variable in quantitative models describing Brazilian stratification processes for which an interval level scaling of occupations is appropriate. For example, the SIBO may help to determine the extent to which the occupational attainment of an individual is tied to that of his or her father. Or it may help to describe how the educational system facilitates or impedes occupational attainment in Brazil. Or it may be used to indicate how strongly economic returns are associated with level of occupations, and how these vary across different subsamples.[13] Many other applications may be forthcoming, such as analysis of the relationship of status to voting behavior or to political unrest. In short, the scale is applicable to numerous problems in stratification analysis, and we anticipate that other researchers will develop other applications.

In addition, perhaps this analysis will encourage social scientists interested in stratification phenomenon in other developing nations to develop objective scales describing national occupational status structures. To date, almost all analytical work on national stratification structures has been conducted on the United States and a few other developed nations. It is time that stratification processes of developing nations came under precise quantitative analysis, replacing the now rampant myths about stratification with empirically secure information. The present scale of the occupational status structure of a major developing nation is a step in this direction.

[12] While this might seem to be true by definition since the SIBO was constructed from its relationship with education and income, it should be remembered that the scale was constructed from group-level data, while the current correlations are calculated on individual-level data. The discriminant model is designed to maximize differences between occupational groups. Of course, given the substantive nature of these variables, it would be surprising if they did not correlate on the individual level. But the relative size of these correlations is an empirical question. The claim that high correlations are "built in" to scales of occupational status is a common misperception (see the discussion in Reiss, 1961, Chapter 7).

[13] Again, see footnote 12. Observed correlations on the individual level are not artifacts of the scaling technique.

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