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STATUS MEASUREMENT AND THE VARIABLE DISCRIMINATION HYPOTHESIS IN AN ISOLATED BRAZILIAN REGION[1]

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ABSTRACT Instruments to measure status position in rural Brazil are presented and evaluated. Seven basic "component" indexes measuring *wealth* (food consumption, level of living, property, monetary income), *education*, *power* (political influence), and *prestige* (occupational rating) are analyzed for stability and concurrent validity. One factor (SES) describes their linear intercorrelations. A plot of each against SES provides support for the variable discrimination hypothesis, holding that nonlinear relations obtain among variables which are components of a unitary stratification system. A new technique for measuring a person's prestige in the community is presented, and it is used with two other variables to provide external evidence of validity of the instruments. Spliced-score indexes designed to utilize the varying discriminatory power of each component are tentatively presented. Linear techniques for status placement seem to work well despite the evidence of variable discrimination. An eight-item level-of-living scale is shown to be a reliable, valid, and economical indicator of the SES factor measured by all of the stratification instruments discussed.

Stratification may be defined as the unequal distribution among social units of (1) access to commonly valued objects and activities and (2) deference or respect. The first of these may be divided into (*a*) power, which is the ability to obtain commonly valued objects and activities, and (*b*) wealth (both monetary and nonmonetary), which is the actual possession of commonly valued objects and activities. The second, deference or respect, is usually called "social honor," following Weber (1946), or "prestige," following most contemporary writers.

There is no obvious limit to the types of social units which may be stratified. Lagos (1963) and Horowitz (1966) speak of international

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stratification. More commonly, sociologists emphasize the stratification of families or households within some larger social unit such as a community or a nation. Often writers show differences on one stratification variable among units of another such variable, as in the comparison of the income provided by various occupations. It is entirely possible that one type of unit may be stratified with respect to another, as when organizations have power over individuals. The present report is restricted to status stratification of small units (Haller, 1970). The data are on the statuses of heads of households in an isolated area of Brazil.

The project from which this report is taken had several aims: (1) to provide instruments for measuring family stratification in rural Brazil, (2) to provide a bench mark for studying changes in the Brazilian stratification system, presumably as a consequence of economic growth, (3) to test the unidimensionality of stratification measures, that is, to learn whether indicators of power, wealth, and prestige are indeed as highly intercorrelated as theory would lead us to expect, and (4) to test the variable discrimination hypothesis, which holds that in highly differentiated systems of stratification (those with large dispersions about the means of status variables) the particular variables which serve to discriminate among the statuses of units at one level of the stratification system are different from those which serve to discriminate at other levels.

The need to accomplish the first purpose is obvious: almost no instruments are available to measure family stratification in Brazil, especially in the rural areas, where an indigenous stratification system once based on landed wealth seems to be present but perhaps declining. The need for the second purpose—to provide a bench mark—is not so evident. It comes about because of the need for determining the changes which stratification systems may undergo and the mechanisms of such changes, a set of phenomena as yet only poorly understood by sociologists (Haller, 1970). The reason for the third purpose is to determine the factor structure of a highly differentiated rural stratification system. The aims of the fourth purpose are to learn whether stratification theory should be slightly altered to allow for nonlinear monotonic relationships among key variables where we have perhaps uncritically assumed the existence of linear relationships, and to determine the appropriateness of theories presuming linear relationships among stratification variables and thus of the use of linear techniques for combining them.

In this article we present (1) a battery of instruments to measure power, wealth, and prestige, (2) a factor analysis of the main subscales composing the battery, (3) tests of the variable discrimination hypothesis, which—unlike ordinary linear systems—proposes that in a highly differentiated stratification system any given stratification

variable discriminates only at certain levels of the system, and (4) tests of the comparative advantages or disadvantages of two scoring techniques which make allowance for the variable discrimination phenomenon.

DATA

Site

We decided upon a site in rural Brazil both because it was convenient (we are familiar with the language and culture) and because it has a highly differentiated stratification system which is probably not yet a simple reflection of the modern Euro-American industrial system. We chose an especially isolated area so as to minimize, if possible, the effects of Brazil's urban-industrial culture on the stratification system. An area approximately bounded by lines drawn from São Paulo through Brasília and Rio de Janeiro and back to São Paulo contains practically all the modern industry of the country. Part of the state of Minas Gerais (Minas) lies within this area. It is land-bound and has no ports tying it directly to centers of Euro-American culture. It has had a well-developed culture of its own dating back to before the industrial revolution. We chose Minas because it lies within a contemporary zone of urban-industrial development but has been a cultural backwater area until recently. It is therefore especially appropriate as a region for observing the impact of economic changes on stratification. We chose the specific research site within Minas Gerais because of its isolation. We eliminated all counties near major cities and arranged the remaining 250 *municipios* ("counties") on a seven-item index of isolation from highways, cities, and mass media (Saraiva, 1969). The 40 most isolated of these we subjected to other criteria. We eliminated those below 100 on an index of urban concentration of population (after Gibbs, 1966) and below 50 on a comparably constructed index of agricultural diversity, leaving 8. Out of these 8, we chose the municipio of Açucena because of its proximity to the urban research base in Belo Horizonte (eight hours by jeep when it could be reached at all) and its lack of serious endemic diseases (chagas and schistosomaiosis, present elsewhere) which would jeopardize the research team. We selected the most remote one-third of the county. The final area is mountainous, so much so that most houses could be reached only on foot or by horse. On the north and south it is bounded by large rivers. On the west it is bounded by mountains impassable by auto. Travelling by auto, one can reach the *sede* (or "county seat"—also called "Açucena") only from the east. It lies on a dirt road about 40 kilometers from an interurban highway.

Data collection

All houses in the area were located on a map and numbered for random sampling and their occupants were identified. A pretested questionnaire administered by trained interviewers was used to collect field data from an approximately random sample of all the heads of households in the area during November and December 1967 and January 1968 (basic N = 520; effective N = 468). The same questionnaire was readministered two months later to a random subsample (basic N = 100; effective N = 91) to estimate the reliability of the data and to evaluate the prestige of occupational titles. All indexes of variables and, where appropriate, all individual items, were tested for stability by means of test–retest correlation coefficients on data collected at intervals two months apart. Validity of the indexes was determined by construct validity techniques: intraindex factor analyses (Harman, 1960) or modified scalogram analyses (Guttman, 1950), interindex factor analysis, tests of interlevel variation in index discriminative power, and correlation with external criteria (community prestige, level of agricultural mechanization, and use of mass media).

THE INSTRUMENTS

Overview

In all, we constructed ten new indexes and added four other measures, either to contribute to one or another of the new indexes or to serve as external criteria for testing their validity. We call the entire group of instruments the "Açucena Battery of Questionnaire Instruments to Measure Stratification."

Each member of the battery is listed in Table 1, which also summarizes the main characteristics of each, correlations among all, and a reference to a somewhat more complete discussion of each. The items in italics are new instruments. Those preceded by an asterisk are stratification instruments. The two not marked in this way were used for checking validity. The ten new indexes of the battery are new to the literature and are as follows (the numbers in the text correspond to those in Table 1): (1) the Açucena food consumption scale; (2) the Açucena occupational prestige score; (6) the Açucena political influence scale; (*7a*) the Açucena level-of-living index (24-item long form); (*7b*) the Açucena level-of-living index (8-item short form); (8) the Açucena socioeconomic status factor index (SES-factor index); (9) the Açucena spliced score socioeconomic status index, empirical form 1 (SES SP-1); (10) the Açucena spliced score socioeconomic status index, parabolic curve form 2 (SES SP-2); (11) the Açucena community prestige index; and (12) the Açucena farmer mechanization index. We also used other variables. Three of these are not especially unusual because their units are not arbitrary and they are in common use. They are required for constructing multi-

Table 1. The Açucena battery of questionnaire instruments to measure stratification

Instrument number[a]	Instrument name (*new instruments in italics*)	Pages in Saraiva (1969)	Levels of most effective SES discrimination	Reliability (r_{tt})	Mean	Standard deviation
*1	*Açucena food consumption scale*	58–63	Low, High	.56	2.34	1.1
*2	*Açucena occupational prestige score*	64–68	Low, High	.80	52.54[b]	13.62
*3	Size of landed property owned	66–70	High	.97	18.93 ha.	62.86
*4	Total annual family monetary income[c]	71	High	.79	NCr$514.91	1106.90
*5	Years of formal education	69–70	Middle	.93	1.17	1.44
*6	*Açucena political influence scale*	72–76	High	.84	.45	1.30
*7a	*Açucena level-of-living index* (24-item long form)	77–82	(Presumably same as 7b)	.98	−.03[d]	14.00
*7b	*Açucena level-of-living index* (8-item short form)	83–86	Low, High	.95	−.03[d]	6.08
*8	*Açucena socioeconomic status factor index (SES-factor)*	86–89	—	.96	0.00[d]	1.00
*9	*Açucena spliced score socioeconomic status index, empirical form 1 (SES SP-1)*	124–137	—	.94	0.19	1.41
*10	*Açucena spliced score socioeconomic status index, parabolic curve form 2 (SES SP-2)*	124–137	—	.94	0.16	1.31
*11	Açucena community prestige index	90–98	—	.92	57.37	95.36
12	*Açucena farmer mechanization index*	98–99	—	.75	1.49	2.64
13	Mass media usage index	99	—	.72	3.98	2.84

Table 1. (Continued)

Instrument number[a]	Instrument name (*new instruments in italics*)	Skewness	Intervariable correlations													
			1	2	3	4	5	6	7a	7b	8	9	10	11	12	13
*1	*Açucena food consumption scale*	Present	—													
*2	*Açucena occupational prestige score*	Present	.42	—												
*3	Size of landed property owned	Present	.33	.43	—											
*4	Total annual family monteary income[c]	Marked	.36	.44	.32	—										
*5	Years of formal education	Present	.39	.39	.11	.36	—									
*6	*Açucena political influence scale*	Marked	.25	.29	.23	.29	.23	—								
*7a	*Açucena level-of-living index* (24-item long form)	Not determined	.56	.65	.40	.55	.57	.45	—							
*7b	*Açucena level-of-living index* (8-item short form)	Present	.54	.63	.40	.52	.54	.44	.95	—						
*8	*Açucena socioeconomic status factor index (SES-factor)*	Present	.69	.78	.58	.69	.63	.54	.88	.87	—					
*9	*Açucena spliced score socioeconomic status index, empirical form 1 (SES SP-1)*	Present	.67	.67	.65	.70	.58	.52	.81	.81	.96	—				
*10	*Açucena spliced score socioeconomic status index parabolic curve form 2 (SES SP-2)*	Present	.65	.66	.67	.70	.56	.51	.81	.80	.95	.96	—			
*11	Açucena community prestige index	Marked	.50	.47	.43	.48	.45	.53	.69	.68	.73	.70	.70	—		
12	*Açucena farmer mechanization index*	Marked	.14	.35	.17	.25	.28	.20	.40	.39	.37	.34	.34	.33	—	
13	Mass media usage index	Present	.43	.39	.18	.42	.50	.38	.52	.51	.58	.55	.53	.50	.22	—

[a] Items preceded by asterisks are stratification instruments.
[b] Calculated from prestige ratings of occupational titles in which the highest have the smallest scores. The highest is 14 and the lowest is 70; hence, $\overline{X} = 52.54$ is quite low.
[c] At the time the interviews were taken, NCr$1.00 = US$0.37.
[d] Index constructed to vary around $\overline{X} \simeq 0.0$.

variable scales. They are (3) size of landed property owned, (4) total annual family monetary income, and (5) years of formal education. One more rather ordinary index, this one requiring arbitrary scoring, is (13) the mass media usage index, used for checking validity.

We refer to instruments 1, 2, 3, 4, 5, 6, and 7*b* as the Açucena component stratification variables; they are the building blocks out of which the more complex instruments were constructed. Instrument 7*a* is a more complex form of 7*b*; 8, 9, and 10 are multivariable instruments composed of the first seven. Number 11 is more properly called a technique than an instrument; if followed it yields a community prestige status score for any individual. Instruments 12 and 13 were included only as validity checks and have nothing to do with the measurement of stratification as such.

The Açucena component stratification variables

In presenting each variable, we shall name it, identify the aspect of stratification which it is designed to measure, describe its content, indicate its test–retest reliability (after a two-month interval), and show its correlation with instrument 11, the community prestige index,[2]

[2] This technique is as follows: A list (*A*) of names of each member of a random subsample of a larger random sample of respondents (*B*) is presented to the latter. Each respondent states whether he knows each member of (*A*) and, if he does, whether the member's prestige is higher than, the same as, or lower than that of each other member of (*A*). A weight, w_j, is assigned to each ratee: $w_j = f_j \cdot K_j/B$, where f_j is the number of raters who claim to be equal to or higher than the ratee ("equal to" or "higher than" equals a score of one, "less than" equals zero); k_j is the number of raters who know the ratee; and B is the total number of raters. A respondent's community prestige score (CP_i) is calculated in this manner:

$$CP_i = \sum_{j=1}^{K} (R_{ij} \cdot w_j) \cdot \frac{\sum_{j=1}^{K} w_j}{\sum_{j=1}^{A} w_j},$$

where w_j, f_j, and k_j are defined as above,

R_{ij} is the ith rater's rating of the jth ratee ("higher than" or "equal to" equals one, "'less than" equals zero) for all ratees known to the rater;

$\sum_{j=1}^{K} w_j$ is the total sum of weights of ratees known to the jth rater; and

$\sum_{j=1}^{A} w_j$ is a constant, the total sum of weights of all ratees.

For further explanation, see Saraiva (1969:90–98). The correlations of this variable with Açucena component indexes range from a low of $r = +.43$ with amount of property owned to a high of $r = +.68$ with the level-of-living index (8-item short form). Its stability is $r_{11} = .92$ (Table 1). See Appendix Table 1 for the distribution of this variable. Note that it shows the marked pyramidal structure usually attributed to stratification systems. Over 80 percent score lower than 100, with 8 percent less than 200, 3 percent between 200 and 299.9, and 5 percent over 300.

Table 2. Contrived scale-items based on frequency of consumption of food items (N = 468)

Contrived item	Item	N	Number of items required for a positive score
1. (low)			2
	Coffee	452	
	Beans	445	
	Manioc flour	421	
2.			2
	Rapadura (brown sugar)	307	
	Hominy	296	
	Rice	255	
3.			2
	Bananas	206	
	Angu	178	
	Pork	121	
	Eggs	121	
4.			2
	Chicken	99	
	Milk	89	
	Cachaca (white rum)	86	
	Macaroni	82	
5.			—[a]
	Salad	57	
6. (high)			3
	Cheese	39	
	Cookies	32	
	Cake	28	
	Potato	23	
	Corn	17	
	Manioc	15	
	Bread	11	

[a] Frequency eaten per week; cutting point: 3 or more times per week.

(a score indicating the evaluation of each person relative to the others [Saraiva, 1969: 92–98]); with instrument 12, the farmer mechanization index (an index of the tools owned by each person involved in agriculture—stability: $r_{tt} = +.75$); and with instrument 13, the mass media usage index (the frequency of reported use of radio, newspapers, magazines, and books—stability: $r_{tt} = +.72$).

1. The Açucena food consumption scale.—This is one of several variables measuring wealth. Social scientists studying Polynesians (Sahlins, 1958), Indian villages (Dube, 1967), medieval France (Duby, 1968), and rural Brazil (Pinto, 1963) have reported that food type and quantity vary by status position. At and just above the survival level, food consumption is expected to function as an indicator of wealth or life chances. This is a Guttman-like scale with contrived

Table 3. Occupational prestige: frequency in the sample, rank, and descriptive statistics for the occupations ranked by the subsample

Main occupation	N	Rank[a]	Mean	Standard deviation
Primary school teacher	1	14	2.18	.712
Farmer	18	17	2.25	.640
Pharmacist	1	20	2.37	.621
Army corporal	1	26	2.56	.771
Sergeant[b]	1	26		
Farm administrator	16	27	2.58	.588
Tratador termico[b] (person who gives heat treatments)	1	29		
Stonemason	5	30	2.68	.755
Merchant[b]	6	31		
Grocer[b]	1	32		
Money-lender[b]	1	32		
Notary public	1	34	2.71	.774
Judicial appraiser[b]	1	38		
Civil servant[b]	13	38		
Carpenter	6	42	3.02	.874
Blacksmith[b]	1	42		
Saddle maker[b]	1	42		
Brickmaker[b]	1	42		
Sitiante (small land owner)	65	43	3.02	.631
Small farmer[b]	2	43		
Seamstress[b]	2	47		
Tailor	1	47	3.17	.746
Settler	2	49	3.20	.641
Barber[b]	1	51		
Retireiro (watchman living on a farm)	5	52		
Serviente[b] (errand boy)	1	54		
Salaried occupant on a farm	1	57	3.32	.818
Basket weaver[b]	1	58		
Mattress maker[b]	1	58		
Gameleiro (gatekeeper)[b]	1	58		
Peddler[b]	2	59		
Small merchant	1	59	3.34	.658
Oxcart driver[b]	2	60		
Terceiro (sharecropper who pays one-third)	217	61	3.36	.834
Cowboy	7	62	3.42	.750
Cook[b]	1	62		
Meiero (sharecropper who pays one-half)	32	64	3.49	.755
Day laborer	11	65	3.54	.917
Coffee-toasting worker[b]	1	65		

Table 3. (Continued)

Main occupation	N	Rank[a]	Mean	Standard deviation
Lavrador (farm laborer)[b]	2	65		
Sawyer[b]	1	66		
Muleteer	1	68	3.66	.685
Prostitute[b]	1	70		
Undefined	5			
Not applicable	21			
No answer	4			

[a] On the basis of 71 titles.
[b] Prestige rank assigned by analogy; occupational title was not included in the questionnaire.

items (Table 2). At the lowest level, any two of the three items coffee, beans, and manioc yield a score of at least one. At the highest level, any three of the seven items cheese, cookies, cake, potatoes, corn, whole manioc, and bread yield a score of six. The reproducibility of this contrived scale is $r_p = .95$. Its stability is $r_{tt} = .56$. (Note that this value is probably partly reduced by seasonal changes in available food.) Its correlations with community prestige, farmer mechanization, and mass media usage are $r = +.50$, $r = +.14$, and $r = +.43$, respectively (Table 1).

2. *The Açucena occupational prestige score.*—This variable is designed to measure prestige by attributing to the individual the social evaluation of his major occupation. Seventy-one occupational titles—30 from the NORC study (Hodge et al., 1966), and 41 from national and local Brazilian occupations—were rated by the subsample (Table 3). A more detailed presentation of these occupational prestige ratings may be found in Haller et al. (1971). Ninety percent of the total sample had occupations whose prestige was so evaluated. The other 10 percent were estimated by Saraiva, a Brazilian sociologist. Unfortunately some of these are not easily translated. *Terceiros* and *meieros* are sharecroppers who receive two-thirds and one-half, respec-

Table 4. Size of landed property owned

Hectares owned	N	Percent
None	307	65
1– 9	65	14
10– 99	69	15
100–999	27	6
Total	468	100

Table 5. Frequency distribution of total annual family income in *Cruzeiros Novos* ($CN)

Intervals	N
0– 199	291
200– 399	54
400– 599	27
600– 799	18
800– 999	7
1,000–1,499	28
1,500–1,999	10
2,000–2,499	12
2,500–2,999	6
3,000 and over	15

Note: $CN1.00 = US$0.37

tively, of the proceeds of their work; a *sitiante* is "a person who owns a small place in the country," here usually a small farmer with 5–20 hectares. Moreover, the major occupation is subject to seasonal and other changes because of the general precariousness of employment in the municipio, especially among the poorest people. The stability of the mean ratings of the 71 occupations is $r_{tt} = +.98$. The stability of the occupational prestige scores assigned to individual respondents is $r_{tt} = +.80$. The correlations of the latter with community prestige, farmer mechanization, and mass media usage are $r = +.47$, $r = +.35$, $r = +.39$, respectively.

3. Size of landed property owned.—This is another measure of wealth. The exact number of hectares owned was elicited. Stability is $r_{tt} = +.96$. Table 4 shows the distribution of this variable. Correlations with community prestige, farmer mechanization, and mass media usage are respectively, $r = +.43$, $r = +.17$, and $r = +.18$ (Table 1).

4. Total annual income.—This too is a measure of wealth. One section of the questionnaire attempted to review all sources of family income, 12 sets of questions in all. The exact sum of all *cruzeiro* earnings was calculated and prorated to the annual basis. For ease of interpretation, these figures were converted to dollars. It was found that more than 60 percent of the sample reported earnings of less than $75 a year. The mean was about $190 a year, and the standard deviation is about $400. (See Table 5 for the frequencies.) Obviously this is a markedly skewed distribution. The stability estimate is $r_{tt} = +.79$. As with instrument 2, this value is depressed by real changes in income due to marginal employment. The external correlations are as follows: community prestige, $r = +.48$; farmer mechanization, $r = +.25$; and mass media usage, $r = +.42$ (Table 1).

Table 6. Frequency distribution of years of education completed

Grade	N
Never attended or never finished the first year	235
Completed first grade	59
Completed second grade	60
Completed third grade	71
Completed primary school	33
Attended *ginasio* (junior high)	3
Missing data	8

5. Years of formal education.—This is a measure which is commonly used in stratification research, possibly as an indicator of nonmonetary wealth, though Svalastoga (1965) holds that it is a key factor in its own right. It was assessed by a direct question on number of years of school completed. As Table 6 indicates, this whole distribution is quite low. The stability is $r = +.93$. Table 1 shows the following external correlations: community prestige, $r = +.45$; farmer mechanization, $r = +.28$; and mass media usage, $r = +.50$.

6. The Açucena political influence scale.—This is designed to measure power. It is a sum of the ranks of the highest political officials from whom the respondent reports having gained some objective he once sought, and a score for offices held (Tables 7 and 8). Actually, because almost nobody was ever a candidate, the latter contributes nothing to the score and could be dropped. Here the basic notion is that the higher the official position of the person from

Table 7. Coding procedure for political influence

Highest response	Score	Highest response	Score
Influence		Offices	
Respondent gained objectives sought from		Respondent never held office nor was a candidate	0
Councilman, once	1	Respondent was candidate for city council only	3
Councilman, rarely, or mayor, once	2	Respondent was candidate for more than one office, or held office of councilman	4
Councilman, often, or mayor, rarely	3	Respondent held 2 or more offices	5
Mayor, often, or state assemblyman, once	4		
State assemblyman, rarely	5		
State assemblyman, often, or secretary, rarely, or congressman rarely	6		

Note: Total political influence score = score on "Influence" + score on "Offices"

Table 8. Frequency distribution of political influence

Score	N
0	403
1	4
2	24
3	17
4	10
5	5
6	1
8	2
9	1
10	1
Total	468

Table 9. Principal components and factor weights for index 7*b*, the Açucena level-of-living scale—24-item long form

Item	Components				h^2	Factor weight
	C_1	C_2	C_3	C_4		
1. Construction of floor	.676	−.487	−.137	−.082	.720	.070
2. Construction of walls	.495	−.018	.412	−.171	.444	.051
3. Ceiling	.724	−.033	.057	−.154	.552	.075
4. Roof	.609	−.509	.013	−.063	.634	.063
5. Number of windows	.499	−.428	−.103	−.144	.464	.051
6. Number of rooms	.800	−.285	−.079	−.125	.744	.083
7. Veranda	.539	−.176	−.003	−.486	.558	.056
8. Maid who cooks	.593	.399	−.464	−.120	.740	.061
9. Possession of pressing iron	.494	−.297	.064	.592	.687	.051
10. Origin of water	.514	.248	.532	.076	.615	.053
11. Method of bringing water in	.671	.117	.381	.040	.610	.069
12. Drinking water processes	.608	.167	−.201	−.164	.465	.063
13. Sewage disposal facilities	.731	.182	.124	−.044	.584	.075
14. Bathing facilities	.749	.155	.048	−.016	.587	.077
15. Lighting facilities	.748	.212	.202	.055	.649	.077
16. Chairs	.699	.158	.097	−.126	.539	.072
17. Sewing machine	.593	−.308	−.075	.203	.493	.061
18. Radio	.686	−.090	−.076	.064	.489	.071
19. Maid who does the washing	.622	.356	−.466	−.035	.732	.064
20. Maid who does the ironing	.595	.138	−.204	.463	.629	.061
21. Possession of watch	.612	.261	−.071	.117	.461	.063
22. Possession of a suit	.528	−.118	−.062	.183	.330	.054
23. Transportation	.568	−.035	−.103	.108	.345	.059
24. Shoes worn during interview	.739	.211	.122	−.025	.607	.076
Factor variances	9.68	1.64	1.27	1.08		
Percentage of total factor variance	70.8	12.0	9.3	7.9		
Percentage of total variance	40.4	6.9	5.3	4.5		

Note: For the exact wording of questions, final coding, and frequency distribution of each item, see Saraiva (1969).

Table 10. Multiple correlation coefficients from stepwise multiple regression of 8 items of the short form level-of-living scale upon the factor scores

Item	R^2	Item test–retest stability
6. Total number of rooms in the house	.460	.905
14. Bathing facilities	.696	.781
15. Lighting facilities	.789	.896
13. Sewage disposal facilities	.815	.887
3. Construction of the ceiling	.845	.981
16. Number of chairs in the living room	.881	.825
18. Radio	.906	.946
1. Type of floor	.924	1.000

Note: R^2 corrected for degrees of freedom.

whom one can gain benefits, the greater the political power that he can exert. More precisely, we distinguish between legitimate power and legal power. The former is more inclusive and refers to any right to exercise power which is not legally prohibited. *Legal power* we use to refer to specific authority invested in an office. Instrument 6 measures differences among adults in the legitimate use of influence to affect decisions of holders of legal power. In other words, we measure legitimate influence rather than legitimate authority, and we do so by determining the highest level of such authority at which influence has been successfully exerted by a person. Unlike any other power indicator known to us, this index provides a score for each sample member. Its stability is $r_{tt} = +.84$. Its correlations with community prestige, farmer mechanization, and mass media usage are $r = +.53$, $r = +.20$, and $r = +.38$, respectively.

7b. The Açucena level-of-living index (8-item short form).[3]—This is another measure of wealth and is based on possessions. It follows the reasoning of Chapin (1933) and Sewell (1940). We examined a total of 58 items related to house construction, to home health and sanitation facilties, to material objects in the living room or other rooms, and to access to services provided by others. Of these, we retained only 24 for further refinement. Each of the latter had (*a*) a main sample nonresponse rate $\leqslant 90$ percent, (*b*) a test–retest nonresponse rate $\leqslant 90$ percent ($N = 80$), (*c*) a stability coefficient of $r_{tt} \geqslant +.60$, and (*d*) a correlation with at least 30 of the original items of $r \geqslant +.20$. These 24 items were subjected to factor analysis. As Table 9 shows, a single factor (C_1) describes their intercorrelations

[3] Instrument 7*a* is not one of the basic measurement devices (component variables) and is not described separately here. It was constructed from component C_1 of Table 9.

Table 11. Frequency distribution of 8-item level-of-living scale

Intervals	N
−8.9 to −8.0	1
−7.9 to −7.0	9
−6.9 to −6.0	6
−5.9 to −5.0	21
−4.9 to −4.0	60
−3.9 to −3.0	131
−2.9 to −2.0	23
−1.9 to −1.0	30
−0.9 to 0.0	35
0.1 to 1.0	14
1.1 to 2.0	14
2.1 to 3.0	18
3.1 to 4.0	20
4.1 to 5.0	14
5.1 to 6.0	6
6.1 to 7.0	8
7.1 to 8.0	4
8.1 to 9.0	5
9.1 to 10.0	5
10.1 and over	44
Total	468

quite well. These were further refined in the following way: A factor-weighted scoring system for instrument *7a* was calculated. (It has a stability of $r_{tt} = .98$.) A stepwise multiple correlation of each item with the factor scores was then performed. This yielded 8 items which together measure level of living just about as well as all the previously mentioned 24. The name of each, plus the progressive R^2 values and

Table 12. Zero-order correlations and principal component factor weights of the Açucena component stratification variables

Variables	[2]	[3]	[4]	[5]	[6]	[7]	Principal component factor weight[a]
1. Food consumption	.398	.330	.387	.357	.250	.544	.689
2. Occupational prestige	1.000	.474	.376	.425	.277	.601	.759
3. Size of property holdings		1.000	.110	.323	.229	.395	.583
4. Education			1.000	.355	.231	.545	.632
5. Income				1.000	.289	.523	.689
6. Political influence					1.000	.439	.538
7*b*. Level-of-living index						1.000	.868

[a] Percentage of total variance explained by the factor = 47.2.

Table 13. Frequency distribution of Açucena SES-factor index scores

SES-factor weighted scores	N
–1.9 to –1.0	14
–0.9 to 0.0	301
0.1 to 1.0	94
1.1 to 2.0	33
2.1 to 3.0	18
3.1 or higher	8
Total	468

the item stability coefficients are given in Table 10. The simple sum of the Z scores contributing to the 8-item index 7*b* correlates highly with the 24-item factor-weighted index 7*a* ($r = +.96$). The former's stability is $r_{tt} = +.95$. The frequency distribution of this variable is given in Table 11. Its correlations with community prestige, farmer mechanization, and mass media usage are, respectively, $r = +.68$, $r = +.39$, and $r = +.51$ (Table 1).

FACTOR STRUCTURE OF THE COMPONENT STRATIFICATION VARIABLES

We performed a principal components analysis (Harman, 1960) of the interindex correlations to test the hypothesis that all indicators, whether of power, prestige, or wealth, would measure basically one factor—stratification. Table 12 presents the results. We found only one component meeting our criterion (an éigen value $\leqslant 1.00$), and that may be called "family stratification position" or, more simply, "family socioeconomic status" (SES). Note that there is no apparent special patterning in the correlation matrix or in the factor weights which would call this conclusion into question. The highest single correlation ($r = +.60$) is between occupational prestige and level of living, one a prestige indicator and the other a wealth indicator. The lowest, $r = +.11$, is between property (wealth) and education (also wealth). All factor weights seem quite high, ranging from .538 to .868. The distribution of the SES factor is presented in Table 13.

The fact that the 8-item level-of-living scale has by far the highest factor weight (.868) suggests that it might provide a simple measure of the whole SES complex variable. If true, this would greatly simplify the measurement of SES. For two reasons, (1) to discover whether this was true, and (2) to provide a base for testing the variable discrimination hypothesis, we calculated standardized SES factor scores for each person. We subjected this new index, instrument 8—the Açucena socioeconomic status factor index, (the SES-factor score)—to the same analysis as we made of each of its constituent parts. Its

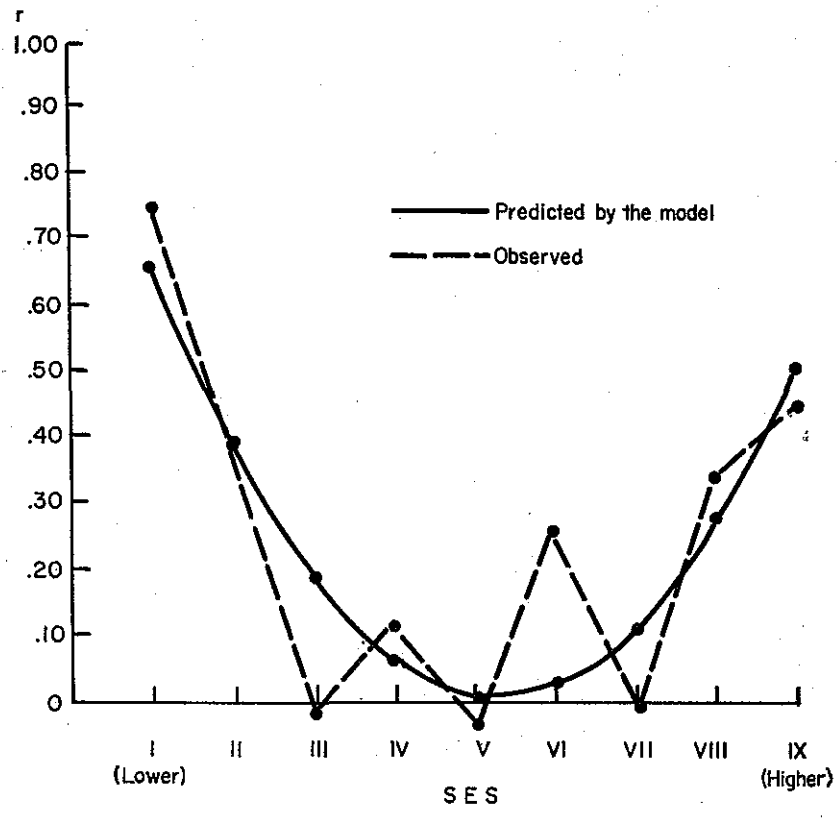

Figure 1. Observed and predicted correlations of food consumption with the SES factor at various levels of SES
Fitness: rho = .289
$y = 1.002 - .377x + .036x^2$

stability was found to be $r_{tt} = +.95$. Its external correlations are community prestige, $r = +.73$; farmer mechanization, $r = +.37$; mass media usage, $r = +.58$ (Table 1). The correlation of SES with the 8-item level-of-living index is $r = +.87$, and their stabilities are identical at $r_{tt} = +.95$. Surely the latter, which is much more economical, would be preferable to the former in much sociological research.

THE VARIABLE DISCRIMINATION HYPOTHESIS

The variable discrimination hypothesis holds that in highly differentiated stratification systems the various constituents of stratification discriminate differently at different levels of the system. In systems

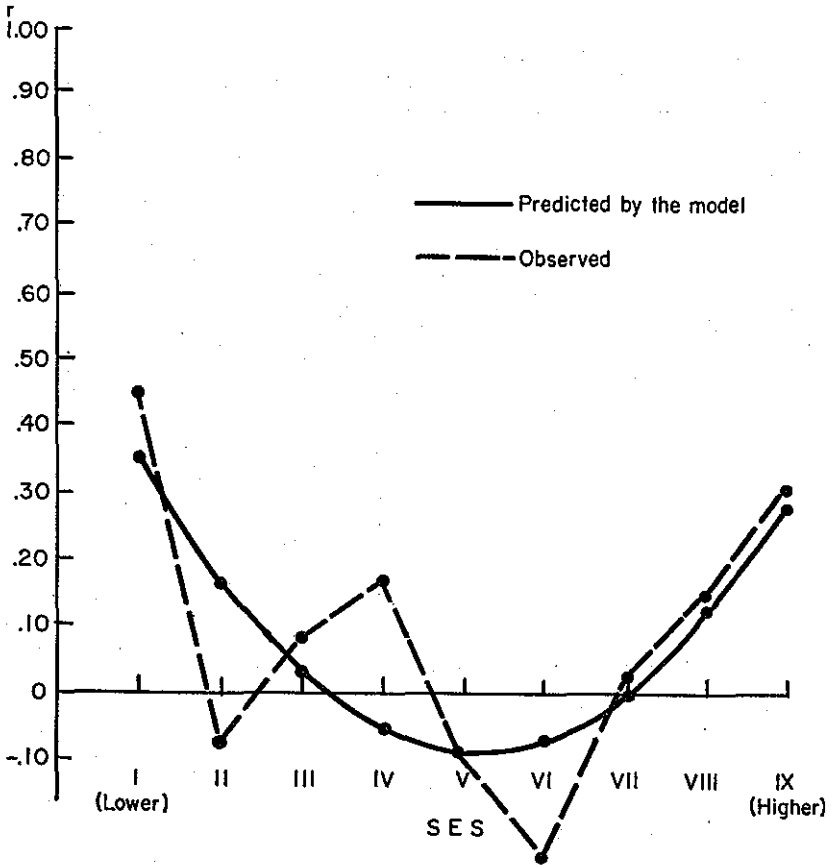

Figure 2. Observed and predicted correlations of occupational prestige with the SES factor at various levels of SES
Fitness: rho = .673
$y = .600 - .268x + .026x^2$

where many are deep in poverty and utterly powerless, for example, money income and political influence would discriminate at the top but not at the bottom, where all would be equally low. But access to food might well discriminate at the bottom. If the hypothesis is true, then, at a minimum, researchers will want to use linear scale combination techniques, such as correlation and factor analysis, with caution. At a maximum, it might be necessary to devise nonlinear techniques for combining the information from various constituent indexes to measure the larger dimension.

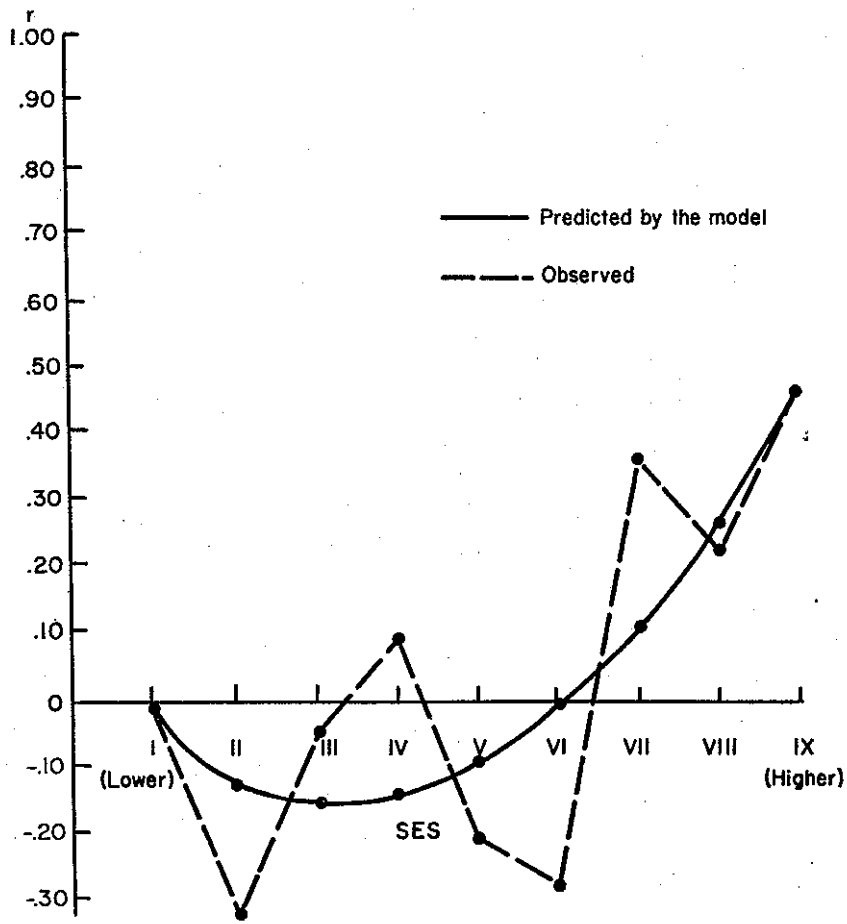

Figure 3. Observed and predicted correlations of size of property with the SES factor at various levels of SES

Fitness: rho = .677

$y = .032 - .118x + .018x^2$

We tested the hypothesis by arraying the correlations of the component indexes with SES, one by one, at each of nine levels of the SES-factor scores. This procedure is justified, for a component variable gains its net SES discrimination (or correlation with SES) because the levels of SES at which it discriminates most are balanced against those at which it discriminates least.

Figures 1 through 7 present curves of discrimination of each Açucena

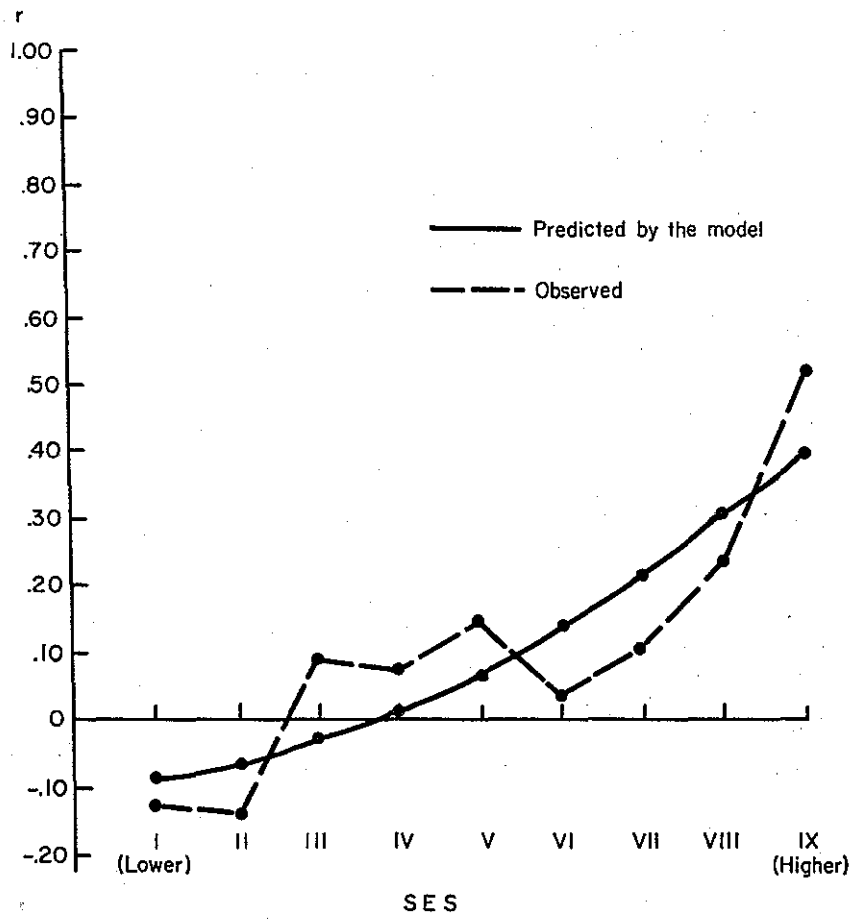

Figure 4. Observed and predicted correlations of income with the SES factor at various levels of SES

Fitness: rho = .914

$y = -.109 + .008x + .005x^2$

component stratification variable against the SES-factor score. (Discrimination curves, though curvilinear, are not the same as curvilinear regressions of variables. If plotted for our data, probably all of the regressions would be monotonic and at least some of them would be nonlinear.) Two curves are presented in each figure. The dotted lines represent the empirical plots of the correlations of a component index with SES. The solid lines represent the best fit of a second-degree parabola ($y = a + bx + cx^2$), which is nothing more than a

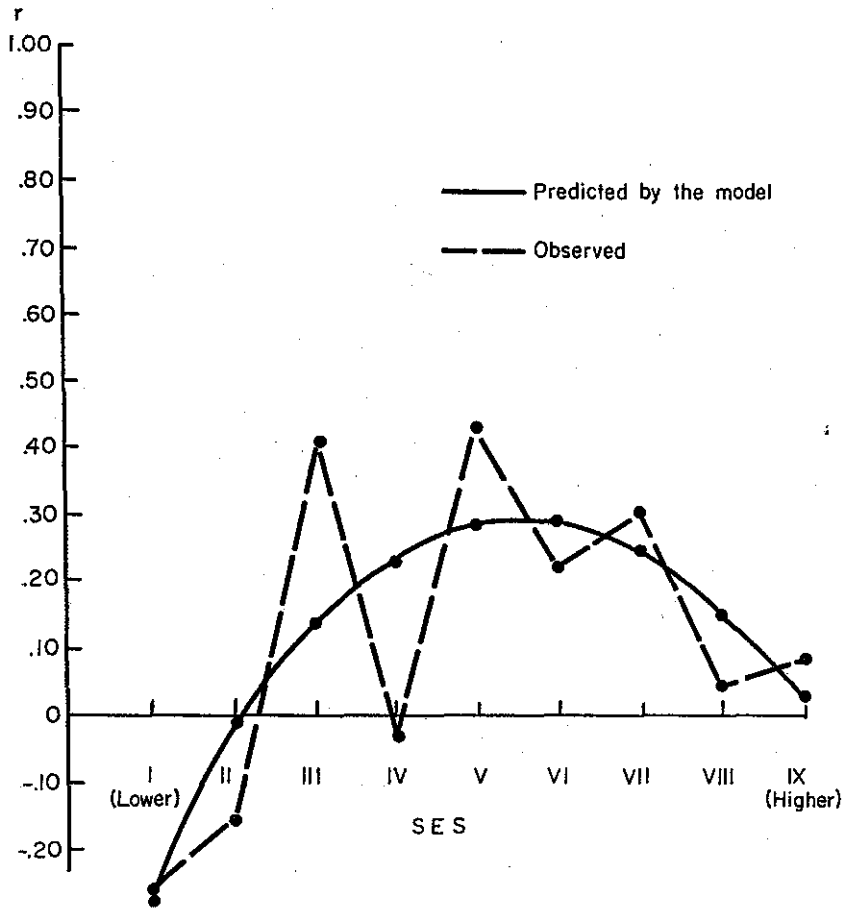

Figure 5. Observed and predicted correlations of education with the SES factor at various levels of SES

Fitness: rho = .651

$y = -.517 + .286x - .025x^2$

way to smooth the empirical curves; they help one to visualize each overall pattern. Briefly, three variables have U curves of discrimination: (1) food consumption (Figure 1), (2) occupational prestige (Figure 2), and (7*b*) the level-of-living index (8-item short form) (Figure 7). These three discriminate at the top and the bottom of the status system, but not in the middle. One variable—(5) education (Figure 5)—shows an inverted U curve. This variable discriminates in the

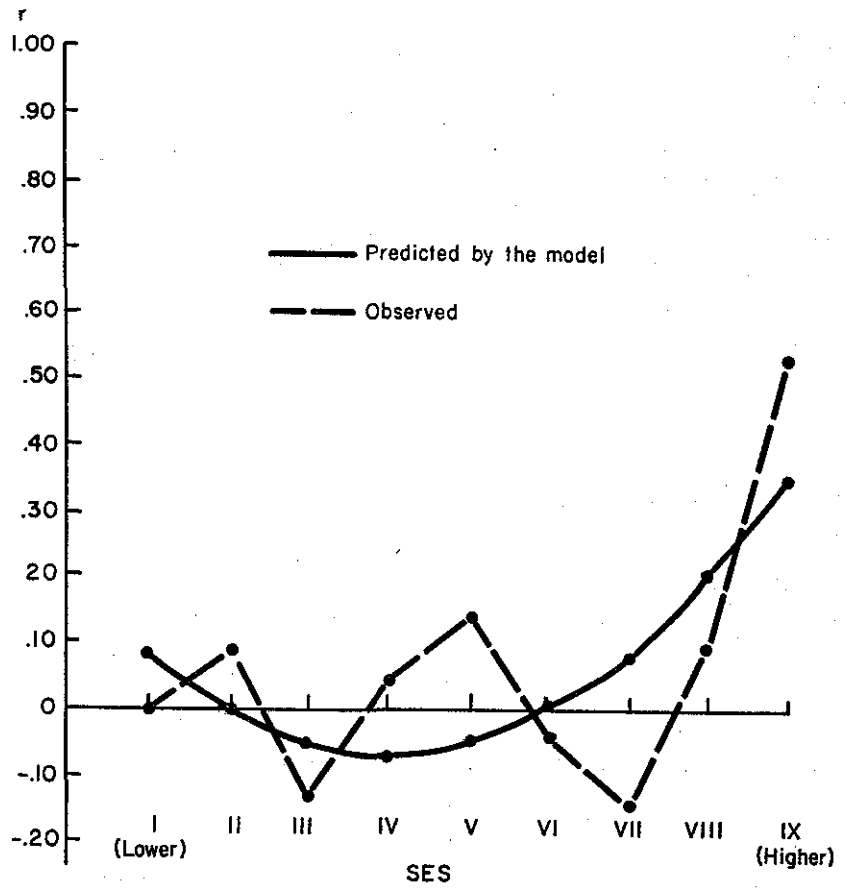

Figure 6. Observed and predicted correlations of political influence with the SES factor at various levels of SES
Fitness: rho = .682
$y = .204 - .135x + .170x^2$

middle of the status system but not at the top or the bottom. Three appear to show J curves: (3) property (Figure 3), (4) income (Figure 4), and (6) political influence (Figure 6). These variables discriminate only at the top of the status system. In other words, only three variables (1, 2, and 7*b*) discriminate at the bottom of the system. One (5) discriminates only in the middle. Six (1, 2, 3, 4, 6, and 7*b*) discriminate at the top. There can be no question but that the variable discrimination hypothesis holds in this region.

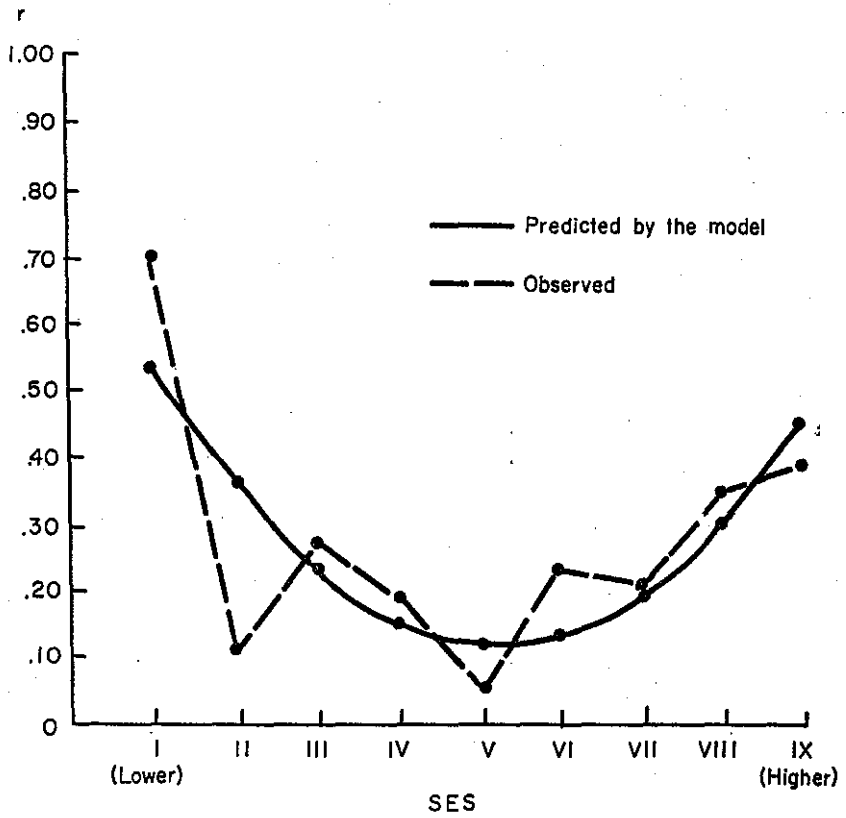

Figure 7. Observed and predicted correlations of level of living with the SES factor at various levels of SES
Fitness: rho = .767
$y = .764 - .245x + .023x^2$

SPLICED SCORE INDEXES: AN ATTEMPT TO INDEX SES UNDER CONDITIONS OF VARIABLE DISCRIMINATION

We constructed two indexes of SES by a method which we call "spliced score indexing," which is calculated to allow each component variable to discriminate at its own level. This method appears to be novel; we offer it quite tentatively, in the hope that others may try it out and evaluate it. One index (variable 9 in Table 1, called *Sp*-1 for short) is based directly upon the observed correlation coefficients. The other (variable 10, Table 1, called *Sp*-2 for short) is based upon the smoothed parabolic curves, in other words, on theoretic values

derived from curve-fitting. The formula for calculating the *Sp* scores is as follows:

$$Sp_i = \sum_{j=1}^{9} \beta_{kj} Z_{ij},$$

where Sp_i is the "spliced index" score of person i,
k is the kth level of SES,
j is the jth SES component variable,
Z_{ij} is the standard score of the ith person on the jth variable, and
β_{kj} is the standardized linear regression weight of the jth variable on SES at the kth SES level.

Details of the calculations are found in Saraiva (1969).

The object of these techniques is to provide a way to locate units (heads of households) in a unitary status system where the variable discrimination hypothesis holds—that is, where the various component indexes discriminate differently at different levels. If it has achieved its aim, its correlations with linear indexes show that linear indexes work satisfactorily in Açucena despite the evidence of variable discrimination phenomena. The reliability of the two spliced indexes is quite high: $r_{tt} = +.94$ for both. The correlations of both with (11) community prestige and (12) farmer mechanization are $r = +.70$ and $r = +.34$, respectively, and with (13) mass media usage, $r = +.55$ and $r = +.53$ for (9) *Sp*-1 and (10) *Sp*-2, respectively. These figures and most others differ very little from those of index 8, the (linear) SES-factor scores. For the present, we conclude that linear techniques may be workable even where variable discrimination is found. This conclusion, and the methods upon which it is based, need careful evaluation, however, and it might be well for sociologists to develop better ways to measure status positions under conditions of marked variable discrimination.

CONCLUSION

In an isolated rural area of Brazil we measured seven basic indexes, at least one of which taps each major dimension of stratification. We found that all seven measure just one linear component—family stratification position or socioeconomic status. We found further that an 8-item level-of-living scale measures this dimension almost as well as a vastly more complex composite SES scale. Nonetheless, there is clear evidence favoring the hypothesis that different component variables discriminate differently at different levels of the stratification system, possibly calling into question such linear combination systems as the foregoing SES scale. It may now be necessary to find nonlinear techniques for combining variables to measure family stratification,

at least in highly differentiated stratification systems. We have tried to do this by a technique which we call spliced score indexing, in which, to be brief, the actual SES discrimination power of each variable at each SES level is used to weight each variable. We calculated two such indexes, one based on each empirical curve and one on each smoothed curve. It turns out that they are highly correlated with the other key indexes.

Assuming that further studies will demonstrate the usefulness of this technique, we believe that this evidence indicates that the linear systems used here (in particular, the SES-factor index and the 8-item level-of-living index) seem to work well in Açucena in spite of the variable discrimination phenomenon. Because of its high degree of reliability and validity and its simplicity, the 8-item level-of-living index instrument would appear to have a bright future in Brazil if further studies show it to work well in other regions. We hope that these instruments will be useful to other research workers in Brazil; indeed, we hope that sociologists everywhere may profit from them, or at least from the techniques which underlie them. Others should be forewarned, however, that the instruments need to be checked in other regions of Brazil before they may be used with confidence.

Also, the fact that the variable discrimination hypothesis is supported makes somewhat questionable the use of linear models to measure stratification positions, although linear systems seem to have worked fairly well here despite the confirmation of the hypothesis. In view of this finding, however, it would be unwise for sociologists to use linear techniques indiscriminately for multiple scale indexing of stratification and even more hazardous to use single stratification components as lone indexes of the general dimension, especially in stratification systems which are even more sharply differentiated than this one—except when they have been carefully checked against others, as is the case with instrument *7b*—the 8-item level-of-living index. We remind the reader that our tentative solution to the measurement problem, the spliced score indexing technique, is new. It should therefore be tested by other researchers.

Finally, will the variable discrimination hypothesis really have any importance in stratification theory? We do not know. Perhaps it could help define strata which are substantially different from one another. Possibly it could provide new ways to establish comparability among the seemingly different stratification systems of different communities, thus facilitating cross-community tests of hypotheses about antecedents, consequences, and changes in stratification. Again, it might help one to understand differences in interaction patterns within and among communities. This much may be said, however. It is clearly a different way of looking at the relationships among stratification variables from that which has been characteristic of the statistically

oriented writers of the past twenty-five years or so. New ways of looking at things often suggest new leads for theory.

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Appendix Table 1. Frequency distribution of community prestige scores

Community prestige scores	N	Percent
0.0 to 1.9	86	27
2.0 to 19.9	74	23
20.0 to 49.9	60	19
50.0 to 99.9	47	15
100.0 to 199.9	26	8
200.0 to 299.9	11	3
300.0 and over	15	5
Total	319	100

Note: Missing data—149.