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OCCUPATIONAL PREPARATION AND THE WAGES OF MIDDLE-LEVEL WORKERS IN SÃO PAULO'S INDUSTRIAL LABOR FORCE[1]

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In underdeveloped countries, concern over human resources (Schultz, 1961; Blaug, 1972) has been increasing as educational deficiences of the population have come to be viewed as an obstacle to development. Brazilian authorities have recently adopted a reformation of education so as to make it contribute more to the economy. Under the new legislation (Diario Oficial, 1971), the Brazilian educational hierarchy is divided into three grades: 1st grade (years 1 through 8); 2nd grade (years 9 - 11); and 3rd grade (years 12 - 15 or over). A 1st grade education is intended to provide the basics common to all specialized knowledge, and, within the limits of facilities and teachers, is required of all. There are two basic options at 2nd grade level. A school may provide the literary or scientific preparation required for entrance into a university or it may be devoted to specialized occupational training. Present policy thus encourages vocational education during early adolescence. Its main aim is to improve the productivity of the labor force.

This requires an explanation. For many years Brazil has had free education through the fourth or fifth year and an essentially free education at the university level. The old ginásios and colégios (junior high schools and high schools) were and--mostly still are--privately owned, and were primarily intended to prepare students for the university. They require that the student pay tuition. This has effectively stopped the education of most of the population during primary school. Moreover, in many regions even the primary schools are so widely separated that many children cannot attend. So Brazil has a large number of illiterate and semi-literate citizens--perhaps more than 50 percent of the present

population. As a result the nation has an oversupply of functionally illiterate and unskilled people for its labor force, an approximately adequate supply of university educated workers, and a scarcity of literate and skilled workers below the university level. The recent extension of free obligatory education through the 1st grade, together with the expansion of vocational education during the 2nd grade, is intended to increase the supply of middle level workers in the labor force.

Some of the principles underlying the new law were inspired by the experience of other underdeveloped countries. One of these is that the formal system of education does not have the sole responsibility for preparing human resources. It shares the task with other institutions, such as labor unions and the employing companies, as well as others. Note also that the new law instructs the 2nd grade schools to provide a general education which can encourage the workers' flexibility and mobility within the job market. Henceforth, a much larger proportion of the population will continue through and then terminate their education at the middle level--that is, the 2nd grade. The new law states that the local 2nd grade curriculum must be "in harmony with the requirements of the local or regional labor market, as determined by periodic surveys" (Diario Oficial, 1971; chapter 1, article 5).

Problem

The Brazilian case may be of special interest to students of comparative education. Brazil's real economic growth has averaged about 10 percent per year for the last five years. Its industries are booming, particularly in the State of São Paulo, which is the industrial center of Latin America. Yet its growth is hampered by the scarcity of personnel trained to perform

efficiently in middle level occupations. The educational structure and the development goals of a number of other countries appear similar enough to those of Brazil to warrant scholarly attention. In this paper we present a review of the types of training completed by nine occupational "families" of the middle level: office and managerial workers in São Paulo's factories and other industries of transformation. We then present an analysis of the total and comparative influence of education and several other key variables (age, seniority, job experience, and occupational influence level ["position"]) on the wage differentials of each of the individual workers in each family. Thus, this article shows the current vocational preparation for middle-level workers in the most dynamic sector of the nation's economy, together with the impact of their training and other strategic variables on wage differentials within each of several key occupational families.

Research Design

In 1970 and 1971, the Institute of Economic Research of the University of São Paulo designed and carried out a research project among a sample of specialized office and managerial workers in a large sample of the industries of transformation in the State of São Paulo. The sample was restricted to the upper and middle levels of the occupational structure of the companies, encompassing only the top six percent of the companies' employees. All of the unskilled and semi-skilled workers were eliminated. This segment of the São Paulo labor force was chosen because, being highly qualified, it plays a critical role in the economy of the state and the nation, and because its experiences may well be instructive for educational planning in other developing countries.

Samples. The field work was begun in July 1970 and was concluded in September 1971. Technically, firms were sampled, and all the specialized workers within each of the sample firms were included (except in the 14 largest companies where a 20 percent random sample was taken within each occupation). The sample of firms is limited to those in the eleven major sectors of the industries of transformation. These are responsible for about 80 percent of the industrial production of the state of São Paulo: food, shoes and clothing, textiles, glass and cement, paper and paper products, electrical equipment, mechanical equipment, chemicals, pharmaceuticals, metal processing, and motor vehicles. The sampling frame followed two criteria of stratification, by sectors and by total number of employees. It yielded an overrepresentation of the more heterogeneous strata where the major industries are to be found. From within the 688 companies studied, data were collected on 23,619 specialized workers, among whom were 17,625 who had a middle-level education and 5,994 who had attended a university.

Middle-level Workers. In this category were included all who were employed as technicians, and/or who were in administrative or support positions in the various functional sectors of the firms: production, management, administration, planning, and auxiliary services. All had received at least five years of formal education and none had attended a university. Only a few more than one-third of the workers in the sample had attended technical or vocational training at the 2nd grade level. The middle level thus includes a large number of marginally-educated people whose employers judged them capable of performing the duties of specialized positions.

To classify occupations we have utilized the concept of "occupational

families" (Shartle, 1946; Blaug, 1972). As used herein it designates a set of occupations grouped according to the type of preparation required in order to exercise the duties of the jobs contained in the set. The original grouping included 39 families at the middle level and fourteen at the upper (or university) level. In the analysis which follows, we dropped most of the former and, of course, all of the latter. The nine which remain are moderately homogeneous as regards their normal duties, yet they include large numbers of persons. Despite this aggregation into families, the composition of the groups is still quite heterogeneous. Within each family there are variations in the hierarchical level in the company, levels of occupational training, etc.

Statistical Analysis. The main body of the analysis is based upon a regression technique called "path analysis" (Blalock, 1971), which permits an estimation of direct, indirect, and total effects of each variable antecedent to the dependent variable.[2] Because, strictly speaking, the sample is not random, generalizations must be drawn with caution. Yet the assumptions of the statistical devices employed are approximated closely enough to yield estimations concerning middle-level personnel in São Paulo's industry sufficient both for planners and students of education and industrial development. The model we have used is summarized in Diagram 1.

Diagram 1 about here

Variables. The data regarding remuneration were used both as a proxy for the productivity of the individual and as important information regarding the supply and demand for each occupation in the market. These were converted into hourly wages (W), a procedure that is becoming routine in

studies regarding human capital (Sorkin, 1968; Schweitzer, 1969; Mayhew, 1971).

The first antecedent variable is the worker's occupational preparation (E). The present indicator is not restricted to formal schooling, as is ordinarily the case in research on the labor force. Each worker's score on the index of occupational preparation is composed of the minimum years of formal education (in the pre-1971 system) normally required for employment in the occupation, plus whatever special occupational training he has obtained. The score is expressed in approximate year-equivalents of education and training pertinent to the individual's job. In the ensuing analysis we shall assess the effects of occupational preparation on individual wages within rather specific middle-level occupational families. Thus though over the whole sample the range is quite wide, within the families studied herein it is narrow.

Three other variables, presumably contributing to one's occupationally relevant experience, were also measured. Their separate and joint effects on wages were estimated. These are: the worker's age in years (A), his seniority in the company in years (S); and his experience in his present job, measured in years in this job (J).

Finally, the workers were classified in terms of their level in the influence hierarchy of the companies. First they were classed according to whether their positions were staff or line (that is, whether they were in the direct line of authority, or whether they were in consulting, technical, or other support positions), and second according to the span of influence they are expected to exert within the company (whether wide, medium, or narrow). The combination of these two criteria yields a six

point scale of occupational influence level in which the smaller scores are attributed to the auxiliary personnel with little decision-making power, and the highest scores are attributed to the directors and managers of the company./ (See Pastore, Gomez, and Haller, 1974) This procedure permitted an evaluation of the occupational influence of the individual, that is to say, his status within the hierarchical structure of the companies.[3] This is illustrated in Figure 1.

Figure 1 about here

Results

Specialized Workers Within the Occupational Structure of Industry.

Only about six percent of the employees of the firms studied herein have occupations requiring specialized knowledge. This places them at the top of the occupational pyramid of São Paulo's industries of transformaion. No doubt this represents a specific stage in the State's industrial development at which the level of mechanization and technology of many plants is still precarious. It is important to recall that this index of the degree of occupational specialization was obtained even though a broad concept of specialized labor was adopted herein--that is despite the inclusion in the sample of a large number of persons who had no systematic occupational training at all.

The proportion of specialized workers tends to increase in the more dynamic sectors--those which are capital-intensive, which have a modern technology, and which have the higher rates of increase, both in production and in number of employees. The middle-level specialists tend to be concentrated in factories producing chemicals, mechanical equipment, electrical equipment, motor vehicles, and pharmaceuticals, rising to 11 percent in the

latter sector. At the other extreme are the firms which manufacture shoes and clothing, an industry which has been slow to adopt modern methods. In these, less than three percent of the employees are specialized.

More than 70 percent of the persons in the total sample are concentrated in but eleven occupation families; nine which are middle level and two which normally require a university education. Among the first, the most numerous is that of mechanics, who constitute about 11 percent of the total sample. Following them in decreasing order are accountants, draftsmen, industrial chemists, secretaries, industrial designers, metal technicians, electricians, and textile technologists. Among these at the "superior" level (those in occupations requiring a university degree) the engineers are most numerous, comprising 12 percent of the total sample. These are followed by the economists and business administrators (six percent treated as one family). The remaining occupational families, 42 in number, absorb a much smaller number of workers.

These findings may have implications for the future of occupational instruction at the 2nd and 3rd grades of the Brazilian educational system. It would appear that the pace of technological modernization will determine, first, the rate of participation of specialized labor within an industry, and second, the kind of training these workers will require. From all the evidence available to date, it would appear that the training requirements for effective work in industrial society are steadily increasing. There can be no doubt about the relation between the mean education of nations and the level of technology of their industries (Blaug, Peston, and Ziderman, 1968; Collins, 1971). Because São Paulo's industry is becoming increasingly capital-intensive, it seems certain that it will require increasing proportions of specialized personnel (Assis, 1972; Langoni, 1972).

At present, however, the São Paulo industries of transformation still provide relatively few opportunities for the employment of specialized workers. After all, they still constitute but a small proportion of the total labor force; and moreover, they are concentrated in a small number of occupational families. This being the case, an unplanned expansion of occupational instruction might well undermine the situation of workers who have already completed their formal training without improving productivity very much. Something like this has already happened to some of those who have university degrees: an explosive increase in the supply of graduates of certain fields is not only causing a decrease in the salary levels of the more reently educated, but also is dislocating them to jobs previously confined to those who were less well educated (Pastore and Perosa, 1971; Levy, et al., 1970).

The Occupational Preparation of Middle-level Personnel. The present analysis concerns the nine most numerous middle-level occupational families named above. According to current thinking in Brazil, each of these should require the equivalent of a complete 2nd grade education, including a vocational specialization. Table 1 shows that São Paulo's industry has a long way to go if it is going to fulfill such a goal.

Table 1 about here

In certain groups, such as metal and textile technicians, more than half of the sample members obtained their preparation through ordinary practical experience, based upon little or no more than a 1st grade education, perhaps merely through the old primary schools, perhaps through the old ginásios (roughly, junior high school). We refer to such people as

"praticos." The highest proportion of these people is found in metal technology (74.1 percent) and in textile technology (56.7 percent). Those who are textile technicians are concentrated in the textile industry while the metal technicians are distributed among various industrial sectors, especially metal processing, motor vehicles, mechanical equipment, and electrical equipment. These two groups are made up of older workers (see Table 2). They also tend to have been with their companies longer and to

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Table 2 about here

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have spent more time in their present jobs. The predominance of these "praticos" may mean that technical positions in these areas tend to be filled by persons who have an atheoretical knowledge of their work. As a consequence they may have difficulty adapting to new types of technology as these become available. Obviously this may inhibit their chances of getting ahead, and it may well be hard for industries dependent upon them to modernize their operations.

Some of the other occupational families are noteworthy for the heterogeneity of the training of those who are employed in them. This is the case of secretaries, 95 percent of whom are women, who include a great many "praticos" who have completed at least the 1st grade and often have attended 2nd grade secretarial schools or have taken short courses in stenography and typing. Mechanics, too, have a varied background. Almost one-half of them were self-taught. Yet about one fourth had taken special training in courses of up to two years, and about one fifth actually completed 2nd grade technical schools. The area of electricity includes electricians, electrical technicians, and electrical mechanics, among

others. In this group the proportions of praticos (about two fifths) is more than offset by those in two other categories, those trained through the 2nd grade (13 percent) and those trained in courses of medium length (up to two years) offered by agencies such as SENAI (40 percent).[4] Draftsmen present a different pattern. Among them the praticos are in a minority. The great majority attended courses too varied to classify, in such areas as mechanical drawing, commercial art, machine tool design, etc.

Those working in accounting, chemistry, and industrial design differ sharply from other middle-level workers. The great majority of these people have completed technical training equivalent to instruction through the 2nd grade. This was obtained in schools of accounting, industrial chemistry, and industrial design, respectively. Because they have been trained more fully than others, they appear to be in a more competitive position. They fill jobs in almost all the industrial sectors here studied. Together with the electricians, these people occupy more influential positions than do those of any of the other middle-level workers in the sample (see Table 2). Personnel trained in accounting, for example, occupy positions as department heads, technical advisors, and even management, in several sectors of industry. Many work as cost accountants, heads of personnel sections, sales supervisors, technicians in economic planning and analysis, auditing, etc. The situation of the chemical workers is also enlightening. This is an area which is opening up in response to the recent expansion of the chemical and pharmaceutical industries. These workers are concentrated in pharmacy, production control, quality control, chemistry, and metallurgy. Turning to industrial design, the great majority (70 percent) were employed in their speciality. Nonetheless, quite a few are

found elsewhere:in time-study, drafting, or as department heads, etc.

Accounting and chemistry are noteworthy, too, because they include a noticeable, though small, number of women--eight and six percent, respectively. The other six occupational families, secretaries excepted of course, are more than 99 percent male.

Path Analysis of Wage Determinants. The hourly wage of each worker is taken as a dependent variable to be explained by the combined effects of each of five other variables. The antecedent variables include most of those that previous researchers have thought to have strong effects on wages--occupational preparation (E), age (A), seniority or years with the firm (S), and job experience or years in the present job (J). In addition we have introduced a new variable, occupational influence (I), which indicates the level in the company at which actions expected of workers in each specific job will exert control over the work of other employees. Occupational preparation (or training), age, and seniority are taken to be exogenous variables, while occupational influence and job experience are taken to be endogenous variables.

Details regarding the path analytic calculations have been explained elsewhere (Pastore, Haller, and Gomez, 1974) and need not be repeated here. Suffice it to say that it is slightly over-identified: while allowance is made for estimating the effects of all the exogenous variables on wages, only two--age and seniority--are assumed potentially to affect job experience. This is because there is no logical reason to expect training to affect one's years on the job and indeed the zero-order correlation in the Appendix shows only a negligible (and negative) correlation in each occupational family.

The direct, indirect, and total effects of each variable in each occupational family, assessed as dictated by the model in Diagram 1, are summarized in Table 2. The table also shows the means ($\bar{X}$), variances (σ^2) and coefficients of determination (R^2). The variables in the model have their greatest combined effects on the wages of draftsmen ($R^2 = .348$), and their smallest on the wages of the metal technologists ($R^2 = .157$), and electricians ($R^2 = .193$). The others lie in a narrow band, explaining about one-quarter of the wage variance ($R^2 = .258$ to $R^2 = .225$). The main findings follow.

1. First, competency pays. Three variables stand out as especially potent overall. They are occupational preparation (E), occupational influence (I), and age (A). On the whole, seniority (S), or time with the company, is not very influential. Job experience (J), or time in one's present job, is even less so. Indeed, its effect is negative in six of the nine occupational families. In other words training, age, and an influential position are the factors which tend to be rewarded among the middle-level workers in São Paulo's industry. In contrast, seniority with the firm, and years of experience in the present job, are only rarely rewarded. São Paulo's industrial system is expanding rapidly and the unions have little power. Also there is a shortage of middle-level technicians. Employers apparently respond to these facts by providing monetary rewards and advancement to higher positions to those who appear to be most highly qualified.

2. Employers in São Paulo's industrial system distribute rewards among middle-level workers according to a rational evaluation of their usefulness

to the company. This follows from the foregoing, and does not require much elaboration. Note that this is in contradiction to those who believe that particularistic relationships, unrelated to productivity, serve as criteria for advancing workers in less developed countries--at least in Brazil.

3. Within occupational families, the smaller the proportion of trained personnel, the greater the influence of occupational preparation on wages. Close scrutiny of Tables 1 and 2 shows that occupational preparation has an especially strong influence on wages among the metal and textile technicians, the mechanics, and the electricians. These are the occupational families with high proportions of self-taught práticos. (There is also a notable influence of occupational level among the textile technicians. A high effect of another variable is not necessarily inconsistent with the above generalization. The fact is that somewhat larger proportions of textile technicians have completed the 2nd grade.) Quite a different pattern, still consistent with the generalization, is shown by the industrial designers, chemical technicians, and accountants. They are normally educated through the 2nd grade. The differences among them in occupational preparation (E) thus are small, and they have a lower effect on wages. Occupational influence level has a noteworthy effect among industrial designers.

Secretaries and draftsmen have patterns which are different both from the other families and from each other as well. Quite a few of the secretaries were trained through the 2nd grade. Most of the others, who had usually completed the old ginásio program (junior high school), learned typing and other skills by themselves. In any case, regarding occupational

preparation they are fairly homogeneous. This is even more true of their occupational influence level, which has the highest mean and the smallest variance of all the families. For them, age is the decisive factor. The occupational training of draftsmen is sharply different from that of all the groups. They are concentrated (in Table 1) in the column entitled "Courses of indeterminate length." Table 2 shows their training to be at a relatively high level, with only a moderate variance. Among them, both age and occupational influence have a strong effect on wages. Again, the cases of these occupational families support the generalization: when preparation is scarce, it counts; where it is relatively abundant other factors are more influential.

4. The strong effect of occupational influence level on the middle-level worker's wage alerts one to sociological aspects of labor market mechanisms which have not heretofore received sufficient attention. There is a grain of truth in the statement of Mata and Bacha (1973) that "the conceptual structure of human capital theory certainly does not capture the phenomenon of hierarchy, which appears to us infinitely more important than the phenomenon of qualification." We conclude that this class of variable is indeed promising. Yet there is also a great deal of exaggeration in their position. At least in these data, qualification--occupational preparation--has just about as much effect on wages as does occupational influence level. Wage differentials are most affected by preparation in precisely those occupations in which workers tend on the average to be less qualified. And in these same occupations a large proportion of the effect of qualification is independent of one's position in the hierarchy. Yet there is no denying that occupational influence level, which is just such a hierarchical variable, is quite important.

Conclusions

This paper has focussed upon the occupational preparation and wage differentials of middle-level technicians employed in technical and administrative support positions in the rapidly expanding industrial sector of an underdeveloped nation. We have found that positions of such personnel are relatively few. They and the university trained personnel together amount to only six percent of the labor force. Recently, national planning efforts have been made to provide training for such people through the 2nd grade (or technical high school) level, but they have a long way to go before this will have been accomplished.

A path analysis yields several findings. Within occupational families, technical competence is rewarded. Both occupational preparation and occupational influence level have substantial effects on wages. So does age. Even more important, occupational preparation has its greatest effect on wages in precisely those occupations in which personnel tend to be less adequately trained, and other variables are more effective in occupations in which the personnel tend to be better trained.

Clearly, the variable "occupational preparation" is a form of education. Yet it describes something a bit different from schooling as it is usually measured. This analysis shows that occupational education--preparation for a rather specific role--exerts substantial effects on wages even when such powerful controls as occupational influence level and age are introduced and when seniority and job experience are taken into account. This variable and the findings which flow from its use are consistent with findings of Müller (1973). From a subtle and sophisticated path analysis of careers of men aged 33 in Germany he finds that occupational education, largely acquired at the adult level, is a major factor promoting upward mobility.

This paper also illustrates variables, methods of measurement, and methods of influence assessment which may prove useful to other researchers interested in the effects of educational attainment on income.

Finally, it is to be expected that other developing nations will experience a similar expansion of their industrial economies. Like Brazil, many of those will find themselves with relatively untrained manpower, and may well confront questions similar to those treated herein. This study of the occupational preparation and earnings of middle-level technicians and administrative support personnel in São Paulo's industrial system provides manpower analysts of such countries with a preview of a situation which may well be faced by their own countries at a similar point in their industrial development. That may occur within a very few years if such countries encourage large-scale investment of foreign capital as has been the case in Brasil.

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TABLE 2

PATH ANALYSES OF THE HOURLY-WAGES OF MIDDLE-LEVEL SPECIALIZED WORKERS IN SELECTED "OCCUPATIONAL FAMILIES": SÃO PAULO, 1970-1971

Occupational Family	Total Effect	Direct Effect	Indirect Effect	R^2	Zero order Correlation with wage	$\bar{X}$	σ
Metal technology							
W-Wage	____	____	____	.157	____	6.45	3.36
I-Occupational influence	.199	(.199)	____	____	.246	2.84	1.04
J-Job experience	-.127	(-.127)	____	____	-.005	4.12	4.51
A-Age	.183	.203	-.020	____	.167	40.14	9.31
E-Occupational preparation	.303	.234	.069	____	.247	6.65	2.77
S-Seniority	.114	.191	-.077	____	.116	8.66	7.84
Textile technology							
W-Wage	____	____	____	.258	____	6.96	4.70
I-Occupational influence	.389	(.389)	____	____	.442	2.71	1.03
J-Job experience	.078	(.078)	____	____	.051	5.89	6.73
A-Age	.151	.149	.002	____	.128	42.09	10.85
E-Occupational preparation	.341	.225	.116	____	.315	8.16	3.40
S-Seniority	.043	-.017	.060	____	.024	10.35	9.85
Secretarial							
W-Wage	____	____	____	.234	____	4.87	2.28
I-Occupational influence	.124	(.124)	____	____	.067	1.06	0.43
J-Job experience	.018	(.018)	____	____	.226	2.21	2.92
A-Age	.383	.379	.004	____	.426	29.62	8.50
E-Occupational	.218	.217	.001		.214	9.06	2.35

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preparation							
S-Seniority	.108	.093	.015		.246	4.17	4.59
Mechanics							
W-Wage				.225		7.24	3.84
I-Occupational influence	.213	(.213)			.287	2.92	1.07
J-Job experience	.046	(.046)			-.022	3.66	4.18
A-Age	.288	.285	.003		.209	38.15	9.50
E-Occupational preparation	.376	.324	.052		.317	8.26	3.05
S-Seniority	-.008	.047	-.055		.034	8.27	7.34
Electricity							
W-Wage				.193		7.27	3.76
I-Occupational influence	.246	(.246)			.295	3.02	1.01
J-Job experience	-.052	(-.052)			.075	4.38	4.82
A-Age	.182	.194	-.012		.174	38.46	9.59
E-Occupational preparation	.324	.266	.058		.248	8.14	2.72
S-Seniority	.155	.183	-.028		.174	8.42	7.34
Drafting							
W-Wage				.348		5.64	2.85
I-Occupational influence	.368	(.368)			.507	2.18	1.22
J-Job experience	-.108	(-.108)			.088	3.04	3.86
A-Age	.350	.269	.081		.420	31.90	8.08
E-Occupational preparation	.154	.083	.071		.164	11.21	2.10
S-Seniority	.133	.154	-.021		.301	5.96	5.95
Chemistry							
W-Wage				.237		6.45	4.43

I-Occupational influence	.184	(.184)	___	___	.263	3.40	1.39
J-Job experience	-.075	(-.075)	___	___	.177	3.31	3.94
A-Age	.389	.367	.022	___	.389	32.36	9.35
E-Occupational preparation	.224	.175	.049	___	.069	11.26	2.11
S-Seniority	.132	.172	-.040	___	.288	6.39	6.66
Industrial design							
W-Wage	___	___	___	.256	___	6.99	3.17
I-Occupational influence	.282	(.282)	___	___	.381	2.96	0.84
J-Job experience	-.135	(-.135)	___	___	.091	2.50	2.97
A-Age	.285	.255	.030	___	.354	32.45	7.57
E-Occupational preparation	.048	.054	.006	___	.009	11.65	1.45
S-Seniority	.201	.244	-.043	___	.300	4.77	4.74
Accounting							
W-Wage	___	___	___	.230	___	8.22	5.06
I-Occupational influence	.271	(.271)	___	___	.349	3.53	1.29
J-Job experience	-.071	(-.071)	___	___	.083	3.44	4.49
A-Age	.382	.339	.043	___	.383	35.71	9.14
E-Occupational preparation	.102	.103	-.001	___	.072	11.69	1.26
S-Seniority	.016	.034	-.018	___	.171	8.24	7.97

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Appendix

Zero-order Correlations Among Variables for Each Occupational Family

		W	I	J	E	A	S
				Metal Technology (N=632)			
Textile Technology (N= 503)	W	———	.442	.051	.315	.128	.024
	I	.246	———	-.090	.294	-.048	-.039
	J	-.005	-.080	———	-.145	.351	.678
	E	.247	.364	-.138	———	-.111	-.207
	A	.167	-.110	.302	.184	———	.355
	S	.116	-.134	.569	-.202	.326	———
				Secretarial (N=1413)			
Mechanics (N= 2607)	W	———	.287	-.022	.317	.209	.034
	I	.067	———	-.120	.226	-.010	-.097
	J	.226	.027	———	-.178	.373	.588
	E	.214	.031	-.002	———	-.203	-.059
	A	.426	.066	.392	.005	———	.401
	S	.246	.103	.639	-.205	.410	———
				Electricity (N=598)			
Drafting (N= 1670)	W	———	.507	.088	.164	.420	.301
	I	.295	———	-.015	.191	.317	.235
	J	.075	-.138	———	-.128	.415	.649
	E	.248	.238	-.183	———	.019	-.205
	A	.174	-.065	.455	-.251	———	.470
	S	.174	-.046	.664	-.053	.502	———

Appendix
(cont.)

		W	I	J	E	A	S
				Chemistry (N=1332)			
Industrial Design (N= 1233)	W	———	.381	.091	.009	.354	.300
	I	.263	———	-.007	-.051	-.211	-.189
	J	.177	.039	———	-.169	.329	.625
	E	.069	.207	-.134	———	-.096	-.224
	A	.389	.098	.428	-.315	———	.528
	S	.288	.053	.645	-.117	.362	———
Accounting (N= 1922)	W	———	———	———	———	———	———
	I	.349	———	———	———	———	———
	J	.083	.039	———	———	———	———
	E	.072	-.029	-.067	———	———	———
	A	.383	.230	.384	-.065	———	———
	S	.171	.155	.564	-.183	.454	———

W: Wage (cruzeiros per hour)

I: Occupational influence

J: Job experience (years in this job)

E: Occupational preparation (in approximate year-equivalents of formal education)

A: Age (in years)

S: Seniority (in years in the company)