# Racial Discrimination in Income

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(preliminary version)

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## I. Introduction

On May 13, 1988 it was commemorated the first centennial anniversary of the abolition of slavery in Brazil. According to the Pesquisa Nacional por Amostragem de Domicilios for this very same year, while mean income for white male population reached Cr$ 96.153, the corresponding figures for the non white population was about half that amount. More precisely, mean income for 'browns' ('pardos') was Cr$ 52.376 and only Cr$ 48.079 for blacks.[1]

In spite of large and enduring differentials of this kind - similar pictures can be obtained for other relevant social characteristics, such as infant mortality (Garcia Tamburo, 1987) or life-expectancy (Wood, 1991) - standard sociological /anthropological treatment of this subject has tended to underplay, or even to reject beforehand, the possibility that racially based discrimination can have a role in the determination of socioeconomic standing in Brazilian society.[2] In fact, two major hypotheses seem to characterize the relevant literature on race relations in Brazil. In the first one, race is expected to play no significant role in the process of social mobility and the present situation of nonwhites is basically explained in terms of their relatively disadvantageous initial position (e.g. Freyre, 1933; Pierson, 1955). A great emphasis is placed in the slave ancestry of the nonwhite population and, following a basically assimilationist perspective, in due time the color groups will be incorporated into mainstream Brazilian society. Even among those theorists who admit the existence of racial prejudice and discrimination in Brazil, this is either supposed to reflect class discrimination (Ianni, 1972) or to be viewed as a cultural inheritance of the past (Fernandes, 1972), a vanishing trait dissolved by the progressive acquisition of adequate human capital by nonwhites.[3]

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[1]   These are geometric means for individuals' main occupation monthly income. The reference population is prime-age (i.e., aged 25 and more) males living in metropolitan areas. The corresponding figures for arithmetic means are Cr$ 164,405 for whites, Cr$ 77,082 for browns and Cr$ 72,116 for blacks.

[2]   A short summary of the relevant sociological literatute on race relations can be found in Hasenbalg (1992).

[3]   As exemplified by the following quotation by one of the leading theorists in this area 'with regard to the first question [whether the city of São Paulo really rejected the Negro as such], it seems obvious that the implications of the rejection involved are truly neither racial or antiracial. The economic, social and cultural isolation of the Negro, with all its unquestionably harmful consequences, was a natural result of his relative incapacity to teel, think and act in the social milieu as a free man. In rejecting him, the society was thus rejecting a human factor that bore within himself a slave or freedman... It represented a demand and above all a challenge to the Negro to rid himself of the human nature he had previously acquired and to adopt the sociopsychological and moral characteristics of the head of a family, the salaried worker, the capitalist entrepreneur, the citizen, etc. It should be kept in mind that in sociological terms this rejection would be specifically racial in character only if the Negro continued to

The second dominant hypothesis refers to the supposedly privileged position occupied by the mulatto population in Brazilian society. According to this hypothesis, associated with the idea of a 'mulatto escape-hatch' (Degler, 1971), mulattoes are expected to enjoy better mobility opportunities than blacks, attaining higher educational, occupational and economic standings. Widespread miscegenation in Brazil had the important effect of attenuating the sharpness of race relations, the discrimination against 'mixed blood' individuals being supposed to be weaker than the one against blacks.[4]

Only in the late 1970's these ideas began to be challenged. Both Hasenbalg (1979) and Silva (1978; 1980) call attention to the possibility that racially-based discrimination can play a significant role in labor -market processes of exploitation and competition. Instead of viewing prejudice and discrimination as a irrational cultural inheritance of the past, these authors suggested that racial stratification is fundamentally rooted in the current social structure of Brazil, racial discrimination being a rational reaction to group conflict over searce social and economic resources. Following this path, a number of empirical studies were made trying to measure the extent of racially-based discrimination in Brazilian labor-market (e.g. Oliveira, Porcaro and Costa, 1981). Silva (1978) analyzed racial income differentials in the Rio de Janeiro area using the 1,27% susample of the 1960 Brazilian Census. Several conclusions seemed to emerge from this study. The first was that blacks and 'browns', contrary to the hypothesis refered to above, seemed to display strikingly similar profiles. This was particularly true with regard to patterns of return to experience and schooling, but similar results also obtain with respect to other variables. An important implication was that to consider blacks and browns as composing a rather homogeneous 'nonwhite' racial group does not seem to constitute a major violence to reality. Rather than being a mere simplification, the joint analysis of blacks and browns in some contexts seemed to be a

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be rejected once he had acquired there characteristics. The data presented suggest the opposite. To the measure in which the Negro acquired the rudiments of these characteristics or showed some capacity to do so, he found the road open and could fit in socially. From this standpoint the Negro's vertical mobility was frustratingly unsatisfactory and slow. Nevertheless, it contributed to destroying the vestiges of the caste society, leaving no trace of their underlying sociodynamic principles, and it contributed concomitanty to the integration of the Negro without the occurrence of violent conflicts with other ethnic groups' (Fernandes, 1971, pp.52-52). As this quotation indicates, one alleged reason for the existence of discrimination against nonwhites in the past was their possession of some undesirable cultural and behavioral traits that made them less reliable and less productive workers.

[4] This is supposed to be the essential aspect distinguishing the Brazilian race relations system from the American one: 'in the United States, the definition of a Negro became anyone with African ancestry, and this definition is unqualified by criteria of class. On the other hand, in Brazil, as in Latin America in general, this simple, biological definition of the Negro never developed. Instead, a special place was reserved for the mixed bload - the mulatto - a development that opened up much wider possibilities for social mobility' (Degler, 1971, pp.203-204).

sensible approach to the analysis of racial discrimination in Brazil.

A second conclusion was the recognition of substantial differences in economic attainment between whites and nonwhites even when we control for the variables relevant to the process of income attainment. Although the magnitude of the income differences that can be attributed to labor market discrimination may be considerably lower than those observed elsewhere, still a quite substantial proportion of these inter-racial differences in Brazil seems to be possibly caused by discriminatory practices. In particular, it was shown that even though nonwhites seemingly enjoy certain advantages at the very lowest levels of attainment, these advantages are superseded by the superior rates of return to experience and schooling enjoyed by whites. The net result is that nonwhites only enjoy a relative advantage over whites at the early phase of their entry into the labor market or at very low levels of skill, in generally poor environments, such as rural areas. Whites are much more efficient in converting experience and educational investments into monetary returns while nonwhites suffer increasing disadvantages as they try to go up the social ladder. These results suggested the rejection of the two major hypothesis in the Brazilian sociological literature as implausible. Neither do 'browns' behave differently from blacks, nor does race play a negligible role in the process of income attainment. Rather it was found that whites enjoy substantial advantages in the labor-market over blacks and 'browns' almost alike. In turns of a summary measure of labor-market discrimination in Rio de Janeiro, it was found that while 82,4% of white-'brown' average income difference could be attributed to differences in 'composition' and 'interaction', 17,6% could be attributed to discrimination in the labor-market. The corresponding figures for blacks were 85,4% and 14,6%, respectively. Therefore, this suggested the surprising conclusion that, if anything, blacks tend to be relatively less discriminated against than 'browns', contradicting the conventional wisdom of historical-sociological literature.

Later, Silva (1986) extended this analysis to include some additional information in terms of some variables not available for 1960, using data from the 1976 National Household Survey (PNAD). Also the analysis was expanded to include all regions covered by the 1976 PNAD. The results largely confirm those from the previous work and it was estimated that for Brazil as a whole in 1976 about 33% of the white-'brown' income difference could be attributed to discrimination in the labor market; the corresponding figure for blacks was 26%. So, again, it was arrived at the surprising result that blacks seem to be less discriminated against than 'browns'.

More recently, Lovell (1989) analyzed racial income inequality in monthly income

among male workers in all metropolitan areas in Brazil. Using data from the 1980 Census, her estimates indicate that mean income of the nonwhite population is about half that for the white population. Using a linear-regression standardization procedure (the same used by Silva, 1980) to calculate the proportion of the mean-income difference due to labor market discrimination, Lovell concludes that for blacks and 'browns' respectively 25 and 32% of the income difference can be attributed to discriminatory practices. Confirming the previous results, she observed that nonwhites receive a differentiated treatment in the labor market but that, contrary to what was said in Silva (1980), there were crucial differences between blacks and browns. Moreover, it was found that income discrimination varies by region, industrial sector and occupational position.

The purpose of the present paper is to revisit racial differences in income attainment, updating the estimates and discussing these results in the light of the previous studies, using data for the Brazilian metropolitan areas from the 1988 PNAD, the year of the centenary of the abolition of slavery in Brazil.

## II. Data and Basic Model

Some restrictions will be imposed to the 1988 PNAD data. First, we will restrict our attention to the 9 metropolitan areas (plus Brasilia) in order to be dealing with more clearly defined labor-markets. Further, having in mind the comparatibility with previous work and in order to minimize selectivity biases. we will examine racial income inequalities among men. Also, because education is a major explanatory variable, we will restrict our sample to men aged 25 or over, since below this age level a very significant proportion has not yet completed their schooling, this being particularly true for the white population. Lower age threshold would probably result in underestimation of racial differences, given the compression of schooling levels really completed by the color groups with higher levels of completed schooling. Final sample size is 19,284 observations.

The basic income-determination model will be a simple Mincerian specification

$$Y_i = \beta_0 + \beta_1 A_i + \beta_2 A^2_i + \beta_3 S_i + e_i \qquad (1)$$

where

Y is the (natural) logarithms of main-occupation monthly income;

A is respondent's age in years and S is respondent's level of completed schooling in years. Model 1 will be evaluated by OLS for three main color groups: white, black and 'brown'. Orientals ('yellow') and non-respondents, who constitute a minor fraction of the sample, are excluded from analysis. Means and standard-deviations for the variables are presented in table 1. Results from OLS evaluation of model 1 are presented in table 2.

Two points seem to be worth considering in these results. First, model fit is much better for whites than for both blacks and browns, as expressed by the fraction of explained variance for each group; second, returns to Age and to Schooling are considerably higher for whites than for nonwhites. Estimates for private rates of return to schooling for whites is 13,3% per year, while for blacks is 10,8% and for browns only 10,1%. Higher returns to Age also obtain for whites, but the black/brown contrast seem to be more marked in this case.

One usual approach (Silva, 1978; Lovell, 1989, 1992) to the study of differences between groups is to apply a linear-regression standardization procedure. This technique partitions income differences between two groups into three parts: discrimination, composition and interaction. The starting point is to estimate the earnings function for each w and n groups and to standardize the income variable by using one groups average $\overline{X}_i$ values and the other corresponding regression coefficients. In particular, we can write

$$f_w(\overline{N}) = b_0^w + \sum_{i=1}^{k} b_i^w \overline{X}_i^n$$

indicating the expected average income for groups n if they had the same earnings function as those in group w. The difference in average income between the two groups can be decomposed (Althauser and Wigler, 1972; Iam and Thornton, 1975) into four different components:

$$\overline{Y}^w - \overline{Y}^n = (b_0^w - b_0^n) + \sum_{i=1}^{k}(b_i^w - b_i^n)\overline{X}_i^n + \sum_{i=1}^{k} b_i^n (\overline{X}_i^w - \overline{X}_i^n) + \sum_{i=1}^{k}(\overline{X}_i^w - \overline{X}_i^n)(b_i^w - b_i^n)$$

The first component is the difference between the two intercepts. The second component reflect the impact of differences in slopes. These two components are indicative of the extent of discrimination in the labor-market (Thurow, 1967; Linder, 1973; Masters, 1975). The third component is a 'composition differences' component, indicating the contribution of differences in the distribution of the explanatory variables to the income differences between the two groups. Finally, the last term, usually called 'interaction component', indicates the covariation between the differences in means and in the coefficients

of the two groups.

The two terms reflecting labor-market discrimination can be rearranged as

$$D = (b_0^w - b_0^n) + \sum_{i=1}^{k} \bar{X}_i^n (b_i^w - b_i^n) = f_w(\bar{N}) - \bar{Y}_n$$

representing the difference between the expected income for those in group n in the absence of discrimination in the labor-market and the actual income for this group. Likewise, the 'composition' (C) and 'interaction' (I) components can be rewritten as

$$C + I = \sum_{i=1}^{k} b_i^n (\bar{X}_i^w - \bar{X}_i^n) + \sum_{i=1}^{k} (\bar{X}_i^w - \bar{X}_i^n)(b_i^w - b_i^n) = \bar{Y}_w - f_w(\bar{N})$$

Therefore, in this particular decomposition technique, following the recommendation of Jones and Kelley (1984), the summary measure of labor market discrimination D includes only differences in intercepts and slopes. Applying this procedure to the data, we arrive at the results reported in table 3: total white/black ln income gap is 0.6931, implying a monetary difference of Cr\$ 48,074. About 51% of this gap is an unexplained residual, normally attributed to discrimination. This means that the expected mean income for the black group in the absence of differences of returns vis-avis de white group is about 42% higher than the actual mean income receive by blacks. On the other hand, total white/brown ln income gap is 0.6075, of which around 46% can be attributed to discrimination. In the absence of discrimination, brown mean income would be about 32% higher than what it actually is.

However, when considering the determination of income the question of the extent of integration of labor-markets appears to be of crucial importance. The tremendous differences in average income among Brazilian regions are well known. Moreover, regional differentiation seems to be particular important when discussing racial differences because, as Hasenbalg (1979) has insistently pointed out, there are marked differences in regional distribution of the color groups, reflecting the past geography of slavery and European immigration. This can be seen in table 4. Apart the obvious locational advantages of the white group, heavily concentrated in the more developed metropolitan regions, it should be noted that between the nonwhite groups the locational advantages tend to favor blacks over 'browns'. While about 31% of people in the later group are located in the poorer Northeastern metropolises, the corresponding figure for blacks is only half that amount. On the other hand, 41% of the blacks are currently living in the Rio de Janeiro metropolitan area, versus only 25% of the 'brown' population.

Therefore we can extend our basic model to include regional effects. One way of doing this is to include in model 1 a number of dummy variables to represent the effect of living each particular metropolitan area, specifying the model

$$Y_i = \beta_0 + \beta_1 A_i + \beta_2 A^2_i + \beta_3 S_i + \sum_{j=4}^{12} \beta_j R_{ij} + e_i \qquad (2)$$

where $R_{ij}$ are the metropolitan regions dummies. To estimate the coefficient in model 2 the Recife M.R. was chosen as base category for the dummy variables. The results of this estimation are reported in table 5.

Comparing the results for models 1 and 2 we find a substantial (and significant at any conventional level) improvement of fit, particularly in the cases of the black and brown groups. For these two groups the proportion of explained variance increase by more than 30%. Not surprisingly, most regions show significantly higher levels of income compared to Recife, the major exception being the Fortaleza R.M. Moreover, it is also worth noticing that the estimated private rates of returns to age and schooling remain almost unaltered.

To test whether the equations for three groups differed significantly from me another, an interactive model was introduced with color white and brown being specified as dummy variables. In this model these two color dummy variables were introduced as a main effect and as interactive effects with each of the other independent variables. The significance of these variable-by-variable contrasts are indicated in the columns for Whites and Browns in table 5 by the appropriate asterisk sign at the left of the respective coefficient. The results indicate significant interactions between color and several independent variables. More specifically, no regional contrast, for both whites and browns, were significant. On the other hand, all black/white contrasts for the human capital variables proved to be significant at the 1% level. As for the Brown group, the returns to Age are significantly different from those for blacks, but only at the 5% level. The black/brown contrast for the private returns to schooling is not significant at any conventional level. In addition, results of general F-tests lead to the rejection of the hypothesis that a pooled model (i.e., model 2 applied to the pooled sample) should be fitted.

Applying the decomposition technique described above the resulting estimate for the unexplained residual gap is reduced to 0,2464 in the case of the white/black comparison. This represents about 36% of the total interracial gap and implies a mean income for the black group in the absence of 'discrimination 28% higher than what it actually is. The results for the white/brown comparison indicate a 30% remaining unexplained gap and a mean income in

the absence of discrimination about 20% higher than present income. These are probably more reliable estimates of the proportion of total income gap that can attributed to eventual discriminatory practices in the labor market.

At this point, it is important to examine the basic ways by which discrimination against nonwhites can be accomplished:

1. Human capital discrimination - nonwhites can have their mobility channels blocked by being prevented from getting their necessary qualifications to enter higher paying occupations;

2. Employment discrimination - nonwhites can suffer more than their proportional share of unemployment;

3. Occupational discrimination - nonwhites can be prevented from entering some better paying occupations, regardless whether they are qualified or not;

4. Wage discrimination - nonwhites can earn less for performing the same jobs as whites, i.e. unequal pay for equal work.

The first type of discrimination takes place mostly before the individuals enter the labor market, largely still within the schooling system. This type of discrimination is examined in the next section. The third and fourth types of discrimination take place after one's entrance in the labor market and will be discuss and evaluated later. Unfortunately we do not have adequate resources to examine the individual's employment status and, therefore, the second type of discrimination listed will not be examined here.

## III. Human Capital Discrimination

In this section we will try to examine the determinants of educational attainment. Schooling not only plays a central role in Human Capital theories of income distribution but also has been constantly found to be a key factor in the socioeconomic attainment process (see, e.g. Blau and Duncan, 1967; Sewell and Hauser, 1972; Haller and Portes, 1973). This has led to a concern for racial differences in educational attainment, with a growing trend towards incorporating the complete set of interpersonal and social-psychological intervening variables that were already available for general models of the attainment process (see e.g. Sewell and Hauser, 1975). An attempt has been made by Portes and Wilson (1976), in which

the intervening variables linking parental background and mental ability to educational attainment included academic performance, significant other's influence, self-esteem and educational aspirations. Their conclusions, although tentative, seem to indicate that for the U.S., when one controls for parental background, mental ability and other intervening variables, the net effect of being black is actually positive on each of the variables included in the model describing the educational attainment process. In other words, there are strong indications that advantages of whites in educational attainment depend directly on their initial advantages in the exogenous variables, i.e., parental background and mental ability. This reinforces the conclusion of past studies (e.g. Jencks et al, 1973) that "blacks' underattainment in education is not due to any discernible discrimination effect, but to initial and historically conditioned disadvantages in the exogenous determinants of the process' (Portes and Wilson, 1976, p.423).

These observations are important to have in mind in our case, because, we will not be describing the complete process of educational attainment, since we don't have measurements for some of the exogenous and intervening variables in that process, like mental ability and other social-psychological variables. Therefore, what we present next is a very limited estimation of an educational attainment model.

The PNAD 1988 do provide some information on individuals parental background. In particular, it was asked about father's schooling and father's occupation, the latter referring to the moment the respondent entered the labor market. It was asked also the respondent's first occupation and his age at entering his first job. However these questions were asked only to heads of households and their spouses, implying in further restrictions to our sample. In fact, in our case this implies a sample reduction to 10.782 respondents. More importantly, this also may introduce some selection bias, apparently toward a more educated population, as can be seen by the means for the variables presented in table 6.

To study the racial differences in schooling determination the model fitted was

$$S_i = \beta_0 + \sum_{j=1}^{9} \beta_j R_{ij} + \beta_{10} O_i + \beta_{11} FS_i + \beta_{12} FO_i + e_i \qquad (3)$$

where S an R are variables measuring respondent's schooling and region of residence, as defined before and

O indicates 'rural origin', a dummy variable measuring whether or not respondent's father had an occupational in the rural sector;

FS indicates father's schooling, measured in terms of years of completed schooling; and

FO is a measure of father's occupational status, measured by a detailed socioeconomic metric scale (Silva, 1973), developed using data on education and income from the 1970 Brazilian Census. The results of fitting model 3 to the 1988 PNAD data are presented in table 7.

Model 3 more aptly describe the process of educational attainment for whites than for both nonwhite groups (as indicated by their respective $R^2$'s), suggesting a higher efficiency in converting parental achievement into advantages to the son's cohort among whites than among nonwhites. This in reinforced by the fact that the for the most important determinant of one's schooling level, Father's Schooling (as indicated by the standardized b's), the estimated effect for whites in much stronger than for nonwhites.[5]

As seen in table 6, nonwhites have substantially lower levels in Parental background variables than whites. In fact, Father's schooling is 72% higher for whites than for blacks, and 54% higher than for 'browns': A similar but slightly weaker picture also obtain relative to Father's Occupation. To investigate the joint effect that these differences in Parental Background might have on respondent's schooling, one can run the same regression standardization technique used before.

Total white/black gap in schooling is estimated in 2.89 years. Applying the decomposition technique we arrive at an estimated D of about 1.89 or 65.5% of the total gap. In other words, educational levels of the black group in the absence of differential returns to the explanatory variables should be 7.83 years, that is, around 30% higher than what it actually is. The corresponding estimate for the white/brown gap is a total difference of 2.42 years, of which 1.70 years is the unexplained residual. This amounts to about 70% of total gap and implies an average educational level in the absence of interracial differences for the brown group about 27% higher than its present level.

As to individual coefficient contrasts (as indicated by the presence of asterisks at left of coefficients in table 7), the contrasts for the brown and black groups are not significantly

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[5]    We might have a little colinearity problem here, since the correlation between Father's Schooling and Father's Occupational Status is $r = 0.627$. This might reflect in the tendency of one compensating the other: the higher the effect of FS the lower the effect of FO. For this reason a better strategy seem to be the interpretation of these variables as composing a joint "Parental Background effect", evaluating them together instead of each separately.

different from zero. The exceptions are the coefficients for Father's Occupational Status, Rio de Janeiro and São Paulo residence, but for these variables the contrasts are only significant at the 5% level and their estimates are actually lower for browns than for blacks. On the other and, all Parental background contrasts between whites and blacks are highly significant.

Taken together, these results seem to suggest that whites are more efficient at converting Family background in educational advantages than both nonwhite groups. In this respect, differences within the nonwhite group seem to be relatively weak and non-significant and, if anything, browns appear to be more disadvantaged in this process than blacks. However, because we cannot control for the effect of other potentially relevant variables like mental ability and social-psychological attitudes, the attribution of these differences to discrimination in schooling is problematic. At any rate, the situation in Brazil seems to e similar to that describe by Blau and Duncan (1967) for the U.S., with the existence of a 'double handicap' for nonwhites in which not only nonwhites have less efficiency in converting educational attainment into income advantages but also that advantages in parental achievement are not as well converted into advantages to the new cohort among nonwhites as among whites.

Finally, a related issue is the question of a possible 'family background bias' in the usual estimates of returns to schooling. The problem here is whether one important specification error, namely the omission of parental background and mental ability, has a significant effect in lowering the estimates of returns to schooling investments. As to the latter variable, there is some empirical evidence for the U.S. that its effect is completely mediated by the intervening variables normally included in attainment models (schooling in particular), with no dissernible direct effect (e.g. Sewel l and Hauser, 1972). As to the first variable, there is a considerable evidence that some of the parental background characteristics are important predictors of individual economic outcomes (e.g. Pastore, 1979). Therefore, the omission of this variable can possible introduce a bias in our previous estimates of labor market discrimination.

To estimate the amount of the bias introduced by the omission of Parental background variables, we estimate essentially the same model 2 with addition of the background variables introduced in the schooling determination equation (model 3):

$$Y_i = \beta_0 + \sum_{j=1}^{9} \beta_j R_{ij} + \beta_{10} E_i + \beta_{11} E^2_i + \beta_{12} S_i + \beta_{13} O_i + \beta_{14} FS + \beta_{15} FO_i + e_i \qquad (4)$$

One crucial difference here vis-a-vis model 2 is that instead using Age as a proxy for

labor-market-experience, we estimate this variable more directly by defining E = (Present) Age-Age-at-first-job. The results of fitting model 4 to the data are presented in table 8.

There are some aspects of these results that are worth mentioning. First, there are significant direct effects of parental background variables, besides those eventually mediated by human capital variables. This is a clear indication that families in Brazilian societies possess some resources other than those going through formal schooling that do affect final economic outcomes.

Second, comparing the results for the equation with parental background added with those in which these variables were omitted (table 5), although the samples are different, estimates for private returns to schooling remain almost unchanged for the nonwhite groups: 10.5% in model 2 versus 9.8% in model 4 for blacks; 11.0% versus 9.9% for browns. On the other hand, the reduction (bias) for the white group is more pronounced: 13.6% in model 2 versus 11.1% in model 4. This seemingly greater bias for whites implies a convergence in the estimated rates of return to schooling, so much so that the contrast for this coefficient for both white/black and brown/black comparisons are not significantly different from zero. This result suggest that, in spite of remaining a difference favoring whites, most of the previously observed interracial differences in returns to schooling seem to be caused by differences in parental background. That is to say, by some extra-schooling family resources - factors that could run from privileged family networks to direct monetary inheritance - that makes whites more efficient in converting schooling into income.

Third and last, the only significant contrasts that remain after the introduction of control for parental background are those related to returns to experience, whites having significantly higher returns than nonwhites. No contrast between browns and blacks are significantly different from zero. Therefore, it seems that whites advantages are related to better career or mobility trajectories, this constituting quite possibility the nucleus of labor market discrimination processes.

Finally, we must ask what effects has the omission of parental background on our measure of discrimination based on standardization, a 'residual variance method'. If we assume that

1.  Parental background (PB) has both a direct and an indirect effect through the other intervening variables on income; and

2. For a given level of PB, the average nonwhite has lower or equal schooling than the average white,

then it can be shown (Silva, 1980b) that it is likely that our measure of labor market discrimination D will e larger when PB is included in the equation than when it is omitted. In other words, our measure D is in this case likely to be an underestimate of the amount of discrimination. We have just shown that both conditions seem do hold for Brazilian society. Therefore we should expect that applying the decomposition technique for the data an income determination in table 8 would result in relatively higher estimates for the unexplained residual than was the case in which Parental background was omitted.

In fact, considering the white/black gap, total difference in ln Income can be estimated in 0.68. The corresponding value for the unexplained residual D is 0.31, that is 46% of total gap (versus 36% previously estimated). Likewise, for a total 0.59 white/brown gap, the estimate of D is 0.19 or 32% of total gap (versus the 30 previously found). These figures imply that black income is 36% lower and brown income is 21% lower than they should be in absence of labor market discrimination.

## IV. Occupational and Wage Discrimination: An Exploratory Exercise

Having shown significant racial differences in income attainment, the next step is naturally, to ask: how are these differences realized? In other words, what are the labor market processes that can possibly generate such differences? As indicated before, labor market racial differences in income can occur in two possible ways. First, nonwhites can be prevented from entering some better paying occupations, regardless of their qualifications. We labelled this process as 'occupational discrimination'. Second, nonwhites can earn less for performing the same jobs as whites, that is, in the same occupations and having the same qualifications. This process was called 'wage discrimination'.

Clearly, implicit in this view is the argument that occupation is the basic labor market variable intervening in the establishment of income differences among color groups. It is through the performance of an occupational role that an individual's income is realized. Therefore, income differences between equally qualified individuals of different groups, in our case color groups, must ultimately be accompanied either by differences in occupational achievement (that is, performance of better paying occupational roles) or by differences in

pay within an occupation, that is, differences in economic reward for the performance of the same tasks.

The study of occupational achievement is a common concern among sociologists, forming the bulk of their analyses of social mobility. Although the analysis of occupational achievement is a well established area of research, the analysis of the relationships between occupation and income attainment seems to be based on far less satisfactory procedures. Typically, in studies of economic attainment, occupation is introduced as a factor with purely additive effects on income. However, there are good reasons to view the labor market as basically stratified along occupational lines, and as such, occupation should be viewed as not only having a net effect on income but also as possibly affecting the whole process of income attainment. In other words, occupation seems to affect the way the other independent variables an related to income achievement (see Stolzenberg, 1975).

Among the arguments advanced in support of the view that the labor market is segmented along occupational lines is the observation that workers often make tremendous occupation specific training investments, and that the higher the level of such investments the less likely it is that workers will seek jobs in another occupation. This undoubtedly would provide a strain toward segmentation of competition among workers in the labor market along occupational lines. As an extreme example, physicians do not compete for jobs with lawyers or engineers.

But, more importantly for our argument here, it has been suggested that some socially-determined factors vary substantially from one occupation to another and these factors affect the wage determination process. In particular, it has been proposed that racial discrimination is one of such factor. Hodge and Hodge (1965) and Stolzenberg (1973) have indicated that both the amount and direction of racial differences in returns to schooling varies from one occupation to another.

For these reasons, the analysis of racial differences in returns to labor within occupational groups should play a central role in the study of labor market discrimination. This argument will be explored a little further later. For now, it suffices to point out that the introduction of occupation in the analysis of racial differences in income leads us to the examination of intra-occupational earnings functions. This implies, in turn, that some simplifications necessary to save degrees-of-freedom are in order. In particular, a first modification in our analytical framework will be to consider only two racial groups. This is necessary because for the analysis of detailed occupational categories the number of blacks

would frequently e too small to guarantee an acceptable level of reliability. But, given that most brown/black differences are small and not significantly different from zero (as we repeatedly indicated earlier), to consider blacks and browns as comparatively homogeneous group does not seem to do much violence to reality, while preserving the essential white/nonwhite contrasts.

Examining first occupational discrimination, a suitable indicator of the general socioeconomic position of occupations seem to e the occupational status scale used earlier to measure Father's Occupational Status. Specifying a model similar to model 2, with the difference that the dependent variable is Occupational Status in the present case, the fit of such model to our data lead to the results reported in table 9. Here we are using again the data for the whole male population aged 25 years or more.

The results for browns and blacks, once more, are very similar, with no contrast between these two group being significantly different from zero. On the other hand, while whites returns to experience appear to e slightly higher than those for nonwhites, the differences in occupational returns to schooling are both very substantial and highly significant. In fact this is the only interracial contrast that is significantly different from zero. Therefore it appears that whites are more efficient in converting educational investments in occupational status. One should be aware, though, that some of there advantages in educational returns might be biased by other non-educational family resources, as our previous analysis of the effects of Parental Background has suggested.

Mean occupational achievement among whites is 18.42 points, while among blacks it is 11.04 points and 11.71 among browns. Decomposing the total 7.38 gap between whites and blacks, we arrive at the estimate that 0.93 remains unexplained by components differences. This represents 12.6% of the total gap. Similarly, of the total 6.71 points brown/white gap, 1.05 remains unexplained, representing 15.6% of the total gap. These are the estimates for the extent of occupation discrimination as a labor market mechanism and the evidence presented suggest that it actually accomplished through a lower efficiency of nonwhites in converting educational investments into occupational gains.

According to the argument developed above, the proper analysis of wage discrimination, that is, unequal pay for equal job, should be performed within each occupational group. In this way we will be allowing occupation to freely interact with all the variables included in the model. But this represents a drastic reduction in the degrees of freedom for each analysis, and thus some simplifications are in order. One of such

simplification has already been suggested: the collapse of the black and brown color categories into one 'nonwhite' group. But further simplifications must be made: more specifically, we must reduce the number of variables in the equation. Therefore, for intra-occupational analysis we will restrict our predictors to the basic human capital variables: Age and Schooling, fitting again model 1

$$Y_i = \beta_0 + \beta_1 A_i + \beta_2 A_i^2 + \beta_3 S_i + e_i$$

when all variable are defined as above.

To ensure a certain reliability level to our analysis, only the occupations having a minimum number of incumbents (20) from each color group were selected. A total of 69 occupations satisfying this criterion were selected. The resulting sample seems to be very representative since it covers exactly 77% of each white and nonwhite total samples. Correlating the proportion of nonwhites with other occupational characteristics, namely mean ln Income and Schooling, it appears that whites and nonwhites are far from having similar occupational distributions. In fact, the proportion of nonwhites incumbents of each occupation is significantly (at the 1% level) and negatively correlated with mean schooling (r = -0.795) and mean ln income (r = -0.4854). This is a result that should be expected given the racial differences discussed earlier.

Unfortunately, due to space, and mainly time, limitations we won't be able to perform a detailed analysis of intra-occupational differences in returns to schooling and to experience between groups. Qualitative and impressionistic evaluation, through, strongly suggest that educational differences are a very minor and that most of the differences that occur appear to be atributable to differences of returns to experience, since educational requirements tend to make occupational incumbents relatively homogeneous in this respect.[6] However, we did proceed to a summary evaluation of interracial differences in intra-occupational income attainment through the measure D and it's extension of relative difference between expected and actual income ($e^D$-1). The results indicate that mean level of the discrimination D is 0.229 and relative difference is 0.272. Looking at the actual distribution of both indicators, we can say that there is a clear tendency for our measures of discrimination to be positive, indicating net white gains. In fact, only in three instances (high school teachers, bar attendants and Real-estate construction entrepreneurs) the coefficients are negative, the vast majority being

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[6] This is self-evident in the case of some professions like physicians and lawyers, where educational requirements are fixed by law. Since educational levels do not vary, necessarily all interracial differences are derived from differences in return to experience. Incidentally, these two cases are among those in which the discrimination measures are highest.

positive and some being very substantial, as can be seen in table 10.

But probably the most interesting aspect of wage discrimination is not its existence as a labor market mechanism but the fact that it seems to vary in both magnitude and direction from one occupation to another. Some hypothesis have been advanced in the literature to explain certain aspects of wage discrimination against nonwhites, among which we have the 'competitive process hypothesis' and the 'crowding hypothesis'. In a well known article, the Hodges (1965) argue that nonwhites are in a weaker economic condition than whites do, and thus, are forced to accept lower wages than whites for the performance of the same job. Because these lower nonwhite wages tend to reduce the white wages in the same occupation, these authors hypothesize that the larger proportion of nonwhite workers in an occupation the greater the resentment of whites against their nonwhite co-incumbents. Their resentment, putting pressure on employers, will ultimately lead to higher levels of discrimination against nonwhites, neutralizing the downward effect on wages caused by nonwhite competition. We could call it, as Stolzenberg (1973) does, the 'economic threat' hypothesis.

On the other hand, we have Bergman's (1971) 'crowding hypothesis'. According to it, some occupations are open to nonwhites and others are not. The resulting crowding in nonwhite occupations causes the relative supply of labor in these occupations to exceed the normal levels, then reducing the wages in these 'nonwhite' occupations. The only whites who would be willing to work in these occupations would be those with high-levels of occupation-specific skills, those able to earn higher wages in these occupations than they could get in 'white occupations' (Bergman, 1971, p.298).

Therefore both 'economic threat' and 'crowding' hypothesis assume that higher levels of participation by nonwhites in a given occupation will lead to higher levels of wage discrimination. To examine the plausibility of these hypotheses we can correlate some selected characteristics of the occupations with their associated absolute and relative discrimination levels. The results of this correlation analysis is presented in table 11.

Both discrimination measures are positively but weakly correlated with measures of socioeconomic standing of the occupations, namely ln income and schooling. In fact none of the correlation coefficients involved are significant at the conventional levels. On the other hand, both measures are negatively and significantly correlated with the proportion of nonwhite incumbents in the occupation. This pattern holds even when we control for the effect of the other occupational characteristics (panels 2 and 3 of table 11), clearly contradicting the hypotheses discussed above. This suggest that holding constant the effect of

other characteristics, being particularity relevant the case of educational requirements, occupational exclusion is associated directly with wage discrimination: the higher the level of exclusion the higher the level of intra-occupational income discrimination. In other words, and linking with the impressionistic evaluation of the nature of wage discrimination, it appears that in some occupations (not necessarily the better paying ones) nonwhites suffer of another double handicap: not only is made difficult but additionally those who succeed at entering them have their careers substantially blocked by discriminatory practices. However, the entrance of other nonwhite incumbents into those occupations seem to diminish the force of these mobility barriers.

## V . Conclusions

In this paper we analyzed two hypotheses steming from the Brazilian literature on race relations. One stated the null hypothesis of non-existence of racial discrimination in Brazilian society; the other recognized a privileged position for the mixed-blood individuals, giving them higher life-chances and better social mobility prospects. This is known as the 'mulatto escape-hatch'. In the light of our results both hypotheses seem implausible: not only there is a substantial unexplained residual in interracial differences in economic outcomes but also we find brown/black contrasts generally weak and non-significant. This suggests the significance of a white-nonwhite color line.

Next we examined the role of parental background in the explanation of interracial differences. Parental background largely determines educational attainment. More importantly, parental background effects directly income attainment, suggesting the importance of other non-schooling familial resources (that is, not expressed only in the number of years of completed schooling) in the determination of economic outcomes. These other familial resources might include factors such as higher ability levels, better positioned social networks or direct property inheritance. But parental background can also be a proxy for quality of schooling, an effect that can go beyond schooling quantity. This is an issue that deserves closer investigation.

The introduction of parental background in the analysis had also two noteworthy consequences: first, interracial differences in returns to schooling, although still showing a net white advantage, do seem to converge and become non-significant. That is, it seems that the interracial differences formally observed can, in fact, be explained by differences in those non-schooling (quantity) familial resources referred to above; second, the only significant

contrast were those distinguishing whites and non-whites as to returns to experience. Therefore, it seems that whites advantages are related to better career trajectories.

Trying to decompose labor market discrimination in terms of occupational discrimination and wage discrimination, it results that occupational attainment is closely determined by individual schooling, suggesting the centrality of educational requirements for occupational incumbency. Similarly, interracial differences also rests on differences in returns to schooling. However, given the results obtained by the introduction of parental background indicators, it seems plausible to think that most of these differences in occupational returns to schooling might be contaminated by differences in other familial resources.

Finally, wage discriminations was also shown to be substantial and, apparently, resulting basically from returns to experience. This seems to be quite plausible given that educational requirements for occupational entry tend to make incumbents somewhat homogeneous as to schooling. As a consequence, estimates of returns to schooling (and by extension, estimates of differences) tend to become small and non-significant. Therefore, wage discrimination seem to stem from differences in career opportunities and mobility chances. Further, examining structural covariates of wage discrimination, it was found that the only significant predictor was the proportion of nonwhites in each particular occupation. Contradicting two well-known hypotheses, the 'economic threat' and the 'crowding' hypotheses, it was found that wage discrimination is negatively related to the proportion of nonwhites, other occupational characteristics held constant.

Taken together there results point out to the existence of 'multiple handicaps' for nonwhites: they are less efficient than whites in converting schooling investments into better paying occupational positions; while in occupational incumbency they suffer from lesser career and mobility chances, resulting in lower economic rewards; and the advantages achieved in one generation are not as well converted into advantages to the new cohort of sons as whites do.

**Table 1.**  **Model 1: Means and Standard Deviations for Color Groups**

| Variables | White | | Black | | Brown | |
|---|---|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. | Mean | S.D. |
| Age | 39.91 | 11.12 | 39.83 | 10.90 | 38.77 | 10.72 |
| Schooling | 7.85 | 4.74 | 5.06 | 3.68 | 5.44 | 3.92 |
| ln Income | 11.47 | 1.01 | 10.78 | 0.81 | 10.87 | 0.84 |
| N | 11,215 | | 1,212 | | 6,857 | |

Source: PNAD 1988 - Special Tabulations

**Table 2.**  **Model 1: OLS Estimates for Color Groups**

| Coefficient for | White | | Black | | Brown | |
|---|---|---|---|---|---|---|
| | $\hat{\beta}$ | t | $\hat{\beta}$ | t | $\hat{\beta}$ | t |
| Constant: $\beta_0$ | 7.943 | 84.55 | 8.551 | 31.99 | 8.134 | 68.21 |
| Age: $\beta_1$ | 0.115 | 26.59 | 0.079 | 6.38 | 0.104 | 18.27 |
| Age$^2$: $\beta_2$ | -0.001 | 25.36 | -0.867E-3 | 6.20 | -0.001 | 17.49 |
| Schooling: $\beta_3$ | 0.133 | 83.93 | 0.108 | 19.08 | 0.101 | 43.16 |
| $R^2$ | 0.404 | | 0.249 | | 0.241 | |
| F | 2,527.509 | | 133.331 | | 726.680 | |

Source: PNAD 1988 - Special Tabulations

**Table 3.    Decomposition of Average In Income Differentials by Color Base Color Group: White**

| Component | Color | |
|---|---|---|
| | Black | Brown |
| Difference: $\bar{y}^w - \bar{y}^n$ | 0.6931 (100%) | 0.6075 (100%) |
| Discrimination | 0.3530 (50.9%) | 0.2772 (45.6%) |
| Composition | 0.2960 (42.7%) | 0.2460 (40.5%) |
| Interaction | 0.0441 (6.4%) | 0.0843 (13.9%) |

Source: Tables 1 and 2.

**Table 4.    Distribution of Color groups by Metropolitan Area**

| Metropolitan Area | Color Group | | |
|---|---|---|---|
| | White | Black | Brown |
| Rio de Janeiro | 24,2 | 41,4 | 25,1 |
| São Paulo | 44,8 | 24,9 | 23,8 |
| Curitiba | 5,8 | 2,0 | 2,0 |
| Porto Alegre | 8,7 | 5,7 | 1,5 |
| Belo Horizonte | 5,6 | 9,3 | 10,5 |
| Fortaleza | 2,2 | 1,2 | 8,0 |
| Recife | 3,1 | 4,6 | 13,7 |
| Salvador | 1,7 | 9,3 | 9,1 |
| Brasília | 3,0 | 1,5 | 5,7 |
| Belém | 0,9 | 0,1 | 0,6 |
| | 100% | 100% | 100% |

### Table 5. Model 2: OLS Estimates for Color Groups

| Coefficient | Color Group | | |
| --- | --- | --- | --- |
| | White | Black | Brown |
| Constant: $\beta_0$ | **7.571** | 8.459** | *7.840** |
| Age: $\beta_1$ | **0.115** | 0.072** | *0.102** |
| Age$^2$: $\beta_2$ | **-0.001** | -0.785E-3** | *-0.001** |
| Schooling: $\beta_3$ | **0.136** | 0.105** | 0.110** |
| Rio de Janeiro: $\beta_4$ | 0.098* | 0.139 | 0.119** |
| São Paulo: $\beta_5$ | 0.550** | 0.643** | 0.626** |
| Curitiba: $\beta_6$ | 0.344** | 0.471** | 0.365** |
| Porto Alegre: $\beta_7$ | 0.170** | 0.126 | 0.194** |
| Belo Horizonte: $\beta_8$ | 0.189** | 0.046 | 0.159** |
| Fortaleza: $\beta_9$ | -0.036 | 0.104 | -0.041 |
| Salvador: $\beta_{10}$ | 0.344** | 0.109 | 0.241** |
| Brasília: $\beta_{11}$ | 0.386** | 0.500** | 0.343** |
| Belém: $\beta_{12}$ | 0.006 | -0.066 | - 0.077 |
| $R^2$ | 0.448 | 0.332 | 0.315 |
| F | 757.432 | 49.679 | 262.568 |

Note: Asterisks at right of the coefficients indicate significance at levels * = 5%; ** = 1%. In the White and Brown columns the asterisks at left of the coefficients indicate de significance of the contrasts of the coefficient relative to that for Blacks, at the same significance levels.

## Table 6.    Means for Variables - Heads of Household

| Variables | Color Group | | |
|---|---|---|---|
| | White | Black | Brown |
| ln Income | 11.62 | 10.94 | 11.03 |
| Schooling | 8.83 | 5.94 | 6.41 |
| Experience | 25.92 | 25.98 | 24.39 |
| Region:          Rio de Janeiro | 0.21 | 0.35 | 0.23 |
| São Paulo | 0.47 | 0.30 | 0.26 |
| Curitiba | 0.06 | 0.03 | 0.02 |
| Porto Alegre | 0.10 | 0.07 | 0.02 |
| Belo Horizonte | 0.06 | 0.09 | 0.11 |
| Fortaleza | 0.02 | 0.01 | 0.07 |
| Salvador | 0.02 | 0.09 | 0.09 |
| Recife | 0.01 | 0.04 | 0.08 |
| Brasília | 0.04 | 0.02 | 0.07 |
| Belém | 0.01 | 0.05 | 0.00 |
| Rural Origin | 0.34 | 0.35 | 0.41 |
| Father's Schooling | 4.07 | 2.37 | 2.65 |
| Father's Occupational Status | 12.28 | 7.80 | 8.68 |

## Table 7.    Determinants of Schooling: Heads of Household

| Coefficients | Color Group | | |
|---|---|---|---|
| | White | Black | Brown |
| Constant | **6.608** | 2.949** | **5.478** |
| Rio de Janeiro | 0.454 | 1.995* | *-0.018 |
| São Paulo | 0.240 | 1.481 | *-0.785** |
| Curitiba | 0.081 | 1.784 | -0.430 |
| Porto Alegre | 0.044 | 1.519 | -0.552 |
| Belo Horizonte | 0.357 | 0.871 | -0.294 |
| Fortaleza | 0.231 | 0.996 | 0.107 |
| Salvador | 1.419** | 1.835* | 0.700* |
| Brasília | 1.615** | 1.468 | 1.147** |
| Belém | 0.291 | 0.428 | 1.843 |
| Rural Origin | *-2.257 | -1.307** | -1.511** |
| Father's Schooling | **0.573** | 0.391** | 0.442** |
| Father's Occupational Status | **0.027 | 0.118** | *0.054** |
| $R^2$ | 0.407 | 0.282 | 0.297 |
| F | 387.158 | 17.799 | 121.216 |

Note: See Table 5.

### Table 8. Determinants of In Income: Heads of Household

| Coefficients | Color Group | | |
|---|---|---|---|
| | White | Black | Brown |
| Constant | 9.478** | 9.683** | 9.454** |
| Rio de Janeiro | 0.068 | 0.002 | 0.106* |
| São Paulo | 0.467** | 0.502** | 0.607** |
| Curitiba | 0.264** | 0.445 | 0.278** |
| Porto Alegre | 0.098 | -0.018 | 0.189 |
| Belo Horizonte | 0.117 | -0.059 | 0.156** |
| Fortaleza | -0.115 | -0.198 | 0.001 |
| Salvador | 0.246** | 0.041 | 0.250** |
| Brasília | 0.310** | 0.391 | 0.318** |
| Belém | 0.037 | -0.560 | 0.033 |
| Rural Origin | 0.032 | 0.117 | 0.006 |
| Experience | *0.055** | 0.034** | 0.045** |
| Experience$^2$ | *-0.882E-3** | -0.582E-3** | -0.721E-3** |
| Schooling | 0.111** | 0.098** | 0.099** |
| Father's Schooling | 0.035** | 0.042** | 0.021** |
| Father's Occupational Status | 0.002* | -0.005 | 0.005** |
| $R^2$ | 0.463 | 0.320 | 0.358 |
| F | 387.743 | 20.155 | 107.493 |

Note: See Table 5.

## Table 9. Determinants of Occupational Attainment

| Coefficient | Color Group | | |
|---|---|---|---|
| | White | Black | Brown |
| Constant: $\beta_0$ | -12.409** | -6.090 | -6.911** |
| Age: $\beta_1$ | 0.455** | 0.425** | 0.423** |
| Age$^2$: $\beta_2$ | -0.003** | -0.004* | -0.004** |
| Schooling: $\beta_3$ | **2.369** | 1.523** | 1.464** |
| Rio de Janeiro: $\beta_4$ | -0.445 | -1.622 | -0.768* |
| São Paulo: $\beta_5$ | -0.254 | 0.018 | -0.160 |
| Curitiba: $\beta_6$ | -0.937 | -0.291 | 1.161 |
| Porto Alegre: $\beta_7$ | 0.485 | -2.129 | -0.701 |
| Belo Horizonte: $\beta_8$ | 0.528 | -1.890 | 0.811 |
| Fortaleza: $\beta_9$ | 1.592 | -1.606 | 0.731 |
| Salvador: $\beta_{10}$ | 1.643 | -0.298 | 0.101 |
| Brasília: $\beta_{11}$ | 0.995 | -1.889 | 0.548 |
| Belém: $\beta_{12}$ | -2.149 | -0.864 | -0.330 |
| $R^2$ | 0.397 | 0.320 | 0.321 |
| F | 615.165 | 47.093 | 270.106 |

Note: See Table 5.

**Table 10.  Univariate Distribution for Discriminant Coefficient:
Absolute (D) and Relative ($e^D_{-1}$)**

| MIDPOINT | COUNT FOR 5.D (EACH X = 1) |
|---|---|
| -.20700 | 1 + X |
| -.10744 | 1 + X |
| -.78889 - 2 | 4 + XXXX |
| .91667 - 1 | 14 + XXXXXXXXXXXXXX |
| .19122 | 18 + XXXXXXXXXXXXXXXXXX |
| .29078 | 16 + XXXXXXXXXXXXXXXX |
| .39033 | 9 + XXXXXXXXX |
| .48989 | 4 + XXXX |
| .58944 | 1 + X |
| .68900 | · 1 + X |
| TOTAL | 69   (INTERVAL WIDTH = .99556 - 1) |

| MIDPOINT | COUNT FOR 11.RELDIF (EACH X = 1) |
|---|---|
| -.18698 | 1 + X |
| -.56013 - 1 | 4 + XXXX |
| .74954 - 1 | 14 + XXXXXXXXXXXXXX |
| .20592 | 19 + XXXXXXXXXXXXXXXXXXX |
| .33689 | 15 + XXXXXXXXXXXXXXX |
| .46785 | 9 + XXXXXXXXX |
| .59882 | 5 + XXXXX |
| .72979 | 0 + |
| .86076 | 1 + X |
| .99172 | 1 + X |
| TOTAL | 69   (INTERVAL WIDTH = .13097) |

Note:    first panel      -   distribution of D
         second panel   -   distribution of $e^D_{-1}$

## Table 11.   Correlations Between Selected Characteristics of Occupations

N = 69    DF = 67    R@ .0500 = .2369    R@ .0100 = .3081

VARIABLE

| | | | | | |
|---|---|---|---|---|---|
| 2. LNINC | 1.0000 | | | | |
| 3. SCHOOL | .3943 | 1.0000 | | | |
| 4. BLACKS | -.4854 | -.7953 | 1.0000 | | |
| 5. DISCRI | .0481 | .1872 | -.3065 | 1.0000 | |
| 6. RELDIF | .0634 | .2102 | -.3235 | .9923 | 1.0000 |
| | 2. LNINC | 3. SCHOOL | 4. BLACKS | 5. DISCRI | 6. RELDIF |

ANALYSIS OF VARIANCE OF 5.DISCRI    N = 69   OUT  OF  69

| SOURCE | DF | SUM SQRS | MEAN SQR | F-STAT | SIGNIF |
|---|---|---|---|---|---|
| Regression | 3 | .19811 | .66036 - 1 | 2.8321 | .0451 |
| Error | 65 | 1.5156 | .23317 - 1 | | |
| TOTAL | 68 | 1.7137 | | | |

MULT R = .34000    R-SQR = .11560    SE = .15270

| VARIABLE | PARTIAL | COEFF | STD ERROR | T-STAT | SIGNIF |
|---|---|---|---|---|---|
| CONSTANT | | .67498 | .26284 | 2.5680 | .0125 |
| 2. LNINC | -.12007 | -.17289 - 1 | .17731 - 1 | -.97506 | .3331 |
| 3. SCHOOL | -.09689 | -.69375 - 2 | .88397 - 2 | -.78481 | .4354 |
| 4. BLACKS | -.28766 | -.54472 - 3 | .22495 - 3 | -2.4215 | .0183 |

ANALYSIS OF VARIANCE OF 6.RELDIF   N = 69  OUT  OF  69

| SOURCE | DF | SUM SQRS | MEAN SQR | F-STAT | SIGNIF |
|---|---|---|---|---|---|
| Regression | 3 | .35733 | .11911 | 3.0075 | .0365 |
| Error | 65 | 2.5742 | .39604 - 1 | | |
| TOTAL | 68 | 2.9316 | | | |

MULT R = .34913    R-SQR = .12189    SE = .19901

| VARIABLE | PARTIAL | COEFF | STD ERROR | T-STAT | SIGNIF |
|---|---|---|---|---|---|
| CONSTANT | | .82389 | .34255 | 2.4051 | .0190 |
| 2. LNINC | -.11229 | -.21053 - 1 | .23108 - 1 | -.91107 | .3656 |
| 3. SCHOOL | -.08074 | -.75238 - 2 | .11520 - 1 | -.65309 | .5160 |
| 4. BLACKS | -.28434 | -.70099 - 3 | .29317 - 3 | -2.3911 | .0197 |

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