International Review of Social Sciences and Humanities
Vol. 2, No.1 (2011), pp. 249-260
www.irssh.com
ISSN 2248-9010 (Online), ISSN 2250-0715 (Print)

Links Between Physical Appearance and Wage Discrimination: Further Evidence

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(Received: 11-9-11/ Accepted: 17-10-11)

Abstract
Unlike the work of Hamermesh and Biddle (1994) where personal appearance is linked to subjective factors such as beauty, this work tries to focus more objectively, relating appearance to certain physical characteristics such as weight, height, and physical disability which can influence an individual's wage. This article intends to search for additional evidence concerning the possibility of the occurrence of wage discrimination originated by the individual's physical appearance.
Keywords: Labor market**,** beauty, physical appearance, wage discrimination and job selection.

I. Introduction

The subject of discrimination in the labor market has been a debating point among economists [Becker (1957); Arrow (1972)]. Several models were elaborated to try to pinpoint the different ways this phenomenon seems to emerge in the labor market. Among the aspects that stand out when the problem of discrimination is mentioned are those linked to the race and sex of the individual [Phelps (1972), Oaxaca (1973), Oaxaca and Ransom (1994)]. However, since the publication of the classic article by Hamermesh and Biddle (1994) topics related to personal appearance became an important study focus among the economists [Green and Riddell (2003); Hamermesh et al. (2002)]. Such works seem to show that the phenomenon of discrimination is not restricted to race or sex alone, but broadens to include people of the same race and sex, who differ only in their physical appearance. Averett and Korenman (1996) show which women's earning weight-for-height are more than obese women. The authors conclude that there is discrimination against obese women. Persico, Postlewaite, and Silverman (2004) find similar results for relating appearance to certain physical characteristics

such as height which can influence an individual's income. Examine the impact that appearance has on a person's earnings

A study by economists Daniel Hamermesh and Jeff Biddle uses survey data to examine the impact that appearance has on a person's earnings. In each survey, the interviewer who asked the questions also rated the respondents' physical appearance. Respondents were classified into one of the following groups: below average, average and above average.

The objective of this study is to verify if factors linked to personal appearance affect remuneration. Unlike the work of Hamermesh and Biddle (1994) where personal appearance is linked to subjective factors such as beauty, this work tries to give a more objective focus, relating appearance to certain physical characteristics such as weight, height, and physical deficiencies which influence the individual's wage[1]. The seminal article of Hamermesh and Biddle (1994) focuses on the beauty concept. The problem here is that one can allege that the concept carries a good dose of subjectivity, because the fact of a person being beautiful or not is not tied to specific determined characteristics, but to a combination of them, as the authors themselves point out. Although there are sources in literature regarding the theme that make suggestions about the stability of the beauty standards in the environment of certain societies, many issues remain unresolved (Hatfield and Sprecher, 1986).

To overcome such difficulties, this work focuses on the analysis of a related theme: personal appearance in the labor market. The advantage of considering the appearance is that unlike beauty, personal or physical appearance is an easier concept to empirically measure because certain standards of appearance are of common knowledge in capitalist society. This article intends to search for additional evidence concerning the possibility of wage discrimination originated by an individual's physical appearance. To do this, data collected in the city of Brasília-DF, were used. Brasilia is the capital of Brazil and is the eighth city in terms of per capita income. Among the information encountered in this research are wages and the variables related to productivity, such as education, experience, and an original set of data associated to the person's physical appearance.

Following the introduction, this study is structured the following way: Section 2 describes the characteristics of the database used in this research. Section 3 presents the results of the econometric model where we test the influence of personal appearance on wages. In Section 4 we analyze the results linked to personal appearance in order to see if it actually has an effect on wage discrimination. Finally, the main conclusions of this study are presented in Section 5.

II. Using Mincerian Equation to Detect Discrimination due to Physical Attributes on Wage

To test the hypothesis of the effect of personal appearance on income, we will test the following specification for the mincerian or wage equation [Mincer (1958); Becker (1962), Griliches (1977)] augmented by variables linked to appearance just as it appears in Hamermesh and Biddle (1994). As pointed out by Griliches (1977), most of the applied research labor economics concentrated on estimating a version of the following equation:

$$w_i = \ln W_i = \alpha + \beta S_i + \delta X_i + u_i \qquad (1)$$

where $\mathrm{Ln}W$ is the wage or salary measurement, S is the schooling measurement which is generally taken in number of years or grades completed, X is the set of control variables that may affect income, and u is the random disturbance comprised of all influences not directly made explicit in the model, but that influence an individual's income. Lastly, the returns are given here by the β parameter, which represents the marginal variation in income in relation to schooling in the relationship between education and the probability of success in the labor market [Card, 2001]. The origin of this interest may be based on the attempt to find an explanation for the increase in wage differentials between individuals possessing high and low levels of education that could indicate different returns for distinct educational groups [Katz and Autor, 1999]. The reason that the wages

[1] Data used by Hamermesh and Biddle (1994) is based on photographs.

appear to be transformed in log in the wage equation is due to the fact that wage equation[2] is a result of the solution of an optimum choice problem of the agent in relation to the impact of the educational level on its discounted future income (Griliches, 1977).
In order to test the influence of the characteristics of personal appearance on wage Hamermesh and Biddle (1994) used the mincerian equation augmented by variables linked to appearance in order to include this

$$Lnw_i = \beta_0 + \beta_1 X_i + \beta_3 W_i + \beta_4 Z_i + \varepsilon_i \quad (2)$$

where X_i is now the group of variables linked to human capital like schooling andexperience which can influence its productivity Here W_i is the group of variables associated to individual characteristics like sex, race, marital status, etc. Finally, Z_i represents the group of variables exclusively linked to the person's physical appearance and ε is the random term. We no longer work with the hypothesis that physical attributes are linked to productivity because to investigate this point it would be necessary to perform a deeper analysis asdescribed in Hamermesh and Biddle (1994) where physical components should be included in equation (1) to take into consideration the correlation between the appearance variables and the individual's occupation. According to the authors, it would be necessary to know when personal appearance affects productivity and when it is generated by a discrimination factor given a priori. In this case, the model to be tested assumes the following format,

$$Lnw_i = \beta_0 + \beta_1 X_i + \beta_2 W_i + \beta_3 Z_i + \beta_4 ATV_i + \beta_5 ATV_i * Z_i + \varepsilon_i \quad (3)$$

where ATV is a dummy variable that assumes value equal to 1 (one) if the individual works in an activity that demands good appearance, and 0 (zero) otherwise. [3]; or study a specific segment of the labor market and verify if beauty or appearance affect wages [Biddle and Hamermesh (1998); Sachsida et al. (2003)]. Intuition here tells us that in some professional fields like fashion, sales, etc., the personal aspect matters more than in others.

III.Database.

Our database was obtained by interviewing 730 adult individuals living in Brasília-DF (Brazil). The interviews were held during the month of October 2009. In the sample only individuals who work in the formal private sector of the economy are included. The interviewers were master students from the Economics department of the Catholic University of Brasília They were specifically trained to perform this kind of research. The average interview duration was about fifteen minutes. The sample was selected from various districts of Brasilia to take into account the diversity of citizens. After obtaining the answers, some adjustments were made in the database: 1) only the questionnaires which were completely filled in were used; and 2) to avoid outliers the observations that were excluded were those in which: i) the individual's monthly wages were less than R$ 100[4] (approximately US$ 37.00) or greater than R$ 10,000 (approximately US$ 3,700.00); ii) the person's weight was less than 35 kg or greater than 200 kg; and iii) the person's height was less than 1.5 m or greater than 2.0 m. After performing all these adjustments the sample found itself reduced to 686 observations.
All the variables used in this study are described in Table 1. Some observations should be made in relation to Table 1. The dummies were formed to enhance the discrimination, except for marital status. For example, by hypothesis and even from empirical evidence it is assumed that non-white individuals are discriminated against in relation to white people. Thus the value one for the variable

[2] In economic literature wage or mincerian equation is generally used to estimate returns to schooling, which is represented by the schooling coefficient.

[3]

[4] The "Real" (R$) is the Brazilian currency.

dummy RACE refers to the non-white individuals. The same holds for other variables like SEX, CHILDREN, etc. Just as it appears in other works related to the estimation of the mincerian equation (Griliches, 1977), the variable EXP2 was included to emphasize the fact that although the impact of the experience is positive, the increase occurs in a decelerated way. Thus, it was hoped that we would find a negative correlation between this variable and the logarithm of wage.

Table 1 presents the definition of the variables adopted in this study. The dependent variable is measured in terms of the monthly wage received by the employee. The data for explicative variables can be desegregated into four categories: human capital, individual characteristics, physical appearance components and set appearance variables. The first group attempts to define the factors that are inherently linked to productivity or that in a general way appear in literature as contributing to explain the wage equation. Some examples are schooling, experience and experience squared (Card, 2001). The second category lists the individual characteristics that can be conceptually related to discrimination. Such factors are represented by sex, race, marital status and if the individual has children. All of these variables frequently appear in any study that concerns the estimation of the wage equation (Card, 2001)

The dummy RACE, as in other studies, seeks to verify if race has some effect on the wage. It is common to find a negative sign for non-white individuals. The same applies to the variable SEX. A number of studies point to the existence of a penalty wage for women (Phelps, 1972). The subject of discrimination in relation to sex is not as obvious as one would imagine at first. Lazer and Rosen (1990) show that discrimination against women in the case of high salaries is due to the fact that women have their careers interrupted because they are responsible for the education of their children. Thus employers possessing limited information about the workers' potential, use sex to predict the employee's future behavior. Finally, the dummy CHILDREN also appears in several articles referring to this subject.

The third group of variables is linked to physical appearance, such as disability (PHYHAND), baldness (BALD), visible lack of teeth (VISIBLE), Speech problems (DICTION), weight problems like obesity (OBESE1, OBESE2) or low height (THIN, TALL), and finally undesirable characteristics associated to height represented by the variable SHORT. It is expected that they all be negatively correlated to the individuals' wages. Finally, the fourth group of variables (BADAPP2 BADAPP3) tries to convey the subject of personal appearance as being not described by factors considered individually, but as being influenced by the presence of all factors combined. We use two dummies which respectively show if the individual has two or three negative attributes. This procedure is in agreement with that which appears in Hamermesh and Biddle (1994) where these authors point out that beauty is something that is associated to the individual's general appearance, as was already mentioned in the previous section. It is necessary to keep in mind that just as appearance dummies are formed, the base of comparison refers to the individual to whom belong no bad appearance characteristics.

Now we will give explanations about points related to the specific measures of physical appearance, mainly those linked to obesity and low weight, diction problems and height[5]. In order to measure obesity we use the Body Mass Index (BMI). This indicator is also used by the World Health Organization and can be used to define different degrees of obesity and verify if the person’s weight is lower than the norm[6]. Based on the BMI index one can define three types of obesity[7]. The BMI is the ratio between weight and height squared. Maranto and Stenoien (2000) using data from the National Longitudinal Survey of Labor Market Experience of Youth found wage discrimination on weight-based wage penalties for young men and women. It was found that mildly obese (20% over standard

[5] In order to minimize errors of measure in variables both weight and height were measured by the interviewers.

[6] There exist some criticism related to use BMI to check obesity. For instance, people who have very muscular mass without be obese. Another critical point is that this index must not be applied in children. Finally some people believe that differences among race affect the BMI, but there is no consensus among the researchers on this subject. In fact, there are no children in our database and the interviewees were conscious about the application of this methodology in people with the very muscular mass. These people who appeared in very small number in the field research were excluded of the sample.

[7] In our sample we can identify no case of obesity of third degree.

weight) white women experience greater wage penalties than black men experience for weight that is 100% over standard weight. Men do not experience wage penalties until their weight exceeds 100 lbs. For a person to be considered disabled, he must suffer some kind of health problem which does not permit him to work normally. Famulary (1992) found evidence of discrimination against physically deficient workers having some kind of epilepsy. To check problems associated to speech the interviewers simply asked or observed if the person had any problems related to the same. If so, the handicap was categorized in the section of the Code of International Classification (CID-10) linked to speech diseases. The more common disorders related to speech are dyslexia, dysphonia, dysphemism, and diction problems. Finally, in order to deal with the height problem, mainly low height, we compare individual height to average height according to sex. In Brazil, mainly in public services like the army, the police force, etc., job selection requires a minimum height of about 1,65 m for men and 1,60 m for women. In this study we test the hypothesis that the private sector can discriminate in the same way. To do this, our study used the variable SHORT that is described in Table 1. Although we have no early evidence of discrimination for high height we utilize the dummy TALL in order to observe if the high height people are discriminated in the labor market.

Table 1
Definition of Variables

Variables	**Description**
Productivity	
LW	Logarithm of monthly wage (workload: 40 hrs. weekly)
SCHOOLING	Completed years of study
EXP	Years of formal work experience
EXP2	Years of formal work experience squared
II. Individual Characteristics	
MARITAL	Marital status (married or in stable relationship=1 and 0 otherwise
RACE	Dummy that assumes value 1 if the individual is not white and 0 otherwise
CHILDREN	Dummy that assumes value 1 if the individual has children and 0 otherwise
SEX	Dummy that assumes value 1 if female and 0 otherwise
III. Physical Appearance Components	
PHYHAND	Dummy that assumes value 1 if individual is physically handicapped and 0 otherwise
BALD	Dummy that assumes value 1 if individual has physically visible problem with baldness
VISIBLE	Dummy that assumes value 1 if individual has visible lack of teeth and 0 otherwise
DICTION	Dummy that assumes value 1 if individual has any problem associated to speech and 0 otherwise. The disease must be included in International Code of Disease (CID-10)

OBESE1	Dummy that assumes value 1 if individual is obese of first degree and 0 otherwise. The individual is obese of first degree if his Body Mass Index (BMI) is between 30.00-34.99. The BMI is the ratio between weight and height squared.
OBESE2	Dummy that assumes value 1 if individual is obese of second degree and 0 otherwise. The individual is obese of first degree if his Body Mass Index (BMI) is between 35.00-49.99.
THIN	Dummy that assumes value 1 if individual is thin and 0 otherwise. The individual is thin if his Body Mass Index (BMI) is lower than 18.00.
SHORT	Dummy that assumes value 1 if individual is short and 0 otherwise. This variable is calculated as follows: 1) men shorter than 1.65 m are considered short; and 2) women shorter than 1.60 are considered short. The Brazilian average height for men is 1.70 m and 1.65 m for women.
TALL	Dummy that assumes value 1 if individual is tall and 0 otherwise. This variable is calculated as follows: 1) men taller than 1.85 m are considered tall; and 2) women taller than 1.80 are considered tall.
Personal Appearance (set)**	
BADAPP3	Dummy that assumes value 1 if individual has 3 or more negative appearance characteristics and 0 otherwise.
BADAPP2	Dummy that assumes value 1 if individual has 2 or more negative appearance characteristics and 0 otherwise.

* In Brazil formal work experience is proven by work booklets signed by the employer. ** Characteristics considered here include all components which appear in group III, except baldness.

IV. Econometric Results.

Table 2 presents the econometric results estimated for the wage equation (1) that appears in Section 1. Column (1) refers to the unrestricted model, where all the variables which supposedly influence wages are tested. Column (2) shows the results of the restricted model in which only statistically significant variables that appear in column (1) are included. Finally, columns (3) and (4) present the model where dummies of physical appearance are presented. In Table 2 it is possible to observe the robustness of the model. In relation to the specification of the model, some points deserve to be emphasized. Keeping in mind the value of the VIF (Variance Inflation Factor), a statistic that calculates the impact on the variance of each variable due to the correlations of the presence of the other coefficients, nothing seems to indicate the existence of the multicollinearity problem [Judge et al, 1982]. This is also shown by the fact that the values of the coefficients of the remaining variables of column (2) remain almost exactly the same. These indicate the robustness of the model.

Concerning the coefficients encountered, some points must first be mentioned. In relation to the variables that define productivity, the results obtained conform to what we find in literature. Except for the variables called SEX and CHILDREN, all are significant and display the expected signs. The coefficient of SCHOOLING represents the return in education. The negative sign for EXP2 also conforms to that which is seen in literature and simply shows that an individual's experience obeys the law of decreasing marginal revenues. Related to individual characteristics, the negative coefficient for the variable RACE confirms that non-white employees are discriminated against in the labor market. People who are married have a premium that can be seen by the positive coefficient for MARITAL. All these results are in agreement to that which appears in Brazilian studies [Ueda and Hoffman (2002); Sachsida et al. (2004)] and international literature [Mincer (1958); Becker (1962), Griliches (1977)]. This point shows that despite the fact that the sample used is small in relation to the databases that are commonly used in labor economics, the quality of the data seems to be significant.

Let us now see what can be said in relation to the effect of personal appearance on wage considering the econometric results obtained from the model. The first point that should be emphasized refers to the fact that a number of appearance variables were shown to be significant in the model. Moreover, for those variables that were significant, all presented the expected signs. Disability, visible lack of teeth and height and weight problems are the factors linked to appearance which may negatively influence an individual's wage. Further analyses linked to physical variables will appear in the next section.

Table 2
OLS Model for the Logarithm of Wages

Independent Variables	**Unrestricted (1)**		**Restricted (2)**		**With set dummies and Attributes (3)**		**Only set dummies (4)**	
Productivity	**Coef.**	**P-Value**	**Coef.**	**P-Value**	**Coef.**	**P-Value**	**Coef.**	**P-Value**
CONSTANT	5.692	0.000	5.753	0.000	5.749	0.000	5.749	0.000
SCHOOLING	0.121	0.000	0.124	0.000	0.125	0.000	0.125	0.000
EXP	0.021	0.000	0.018	0.000	0.018	0.000	0.018	0.000
EXP2	-0.001	0.000	-0.001	0.000	-0.002	0.000	-0.002	0.000
Individual Characteristics								
MARSTAT	0.121	0.021	0.094	0.050	0.091	0.061	0.091	0.061
SEX	0.049	0.272	-	-	-	-	-	-
CHILDREN	-0.068	0.143	-	-	-	-	-	-
RACE	-0.065	0.041	-0.063	0.035	-0.059	0.045	-0.059	0.045
Appearance (Components)								
PHYHAND	-0.493	0.006	-0.4973	0.005	-0.459	0.010	-	-
SPEECH	0.062	0.318	-	-	-	-	-	-
VISIBLE	-0.160	0.024	-0.167	0.018	-0.135	0.022	-	-
BALD	-0.047	0.670	-	-	-	-	-	-
OBESE1	-0.091	0.478	-	-	-	-	-	-
OBESE2	-0.076	0.268	-	-	-	-	-	-
THIN	-0.166	0.034	-0.206	0.034	-0.207	0.032	-	-
SHORT	-0.165	0.002	-0.186	0.000	-0.173	0.001	-	-
TALL	0.026	0.729	-	-	-	-	-	-
Appearance (Dummies)								
BADLOOK2	-	-	-	-	0.008	0.918	0.008	0.198
BADLOOK3	-	-	-	-	-0.327	0.030	-0.327	0.001
TEST F	10.31	0.000	17.65	0.000	17.65	0.000	20.42	0.000
VIF	1.33		1.03		1.10		1.03	
Adj. R^2	0.160		0.162		0.165		0.144	
OBS	686		686		6866		686	

V. Does Personal Appearance Matter?

Table II shows the results obtained for wage equation. Firstly concerning to the variables associate to human capital such results are in accordance with the literature, indicating that wage correlates positively to schooling and experience [(Card, 2001), (Garen, 1984), (Sachsida et al, 2003)]. The results also show that wage correlates negatively with EXP2 what is noticed in literature because one year plus of experience augments the wage but in a relationship minor than one. The result for race is also in according to previous research ((Sachsida et al, 2003) on wage equation, indicating that

nonwhite people receive penalty in labor market. Finally, we observe that MARSTAT correlates positively with wage. We admit here that employers consider married employees more serious in related to their job because they are also responsible for their family.

Based on Table 2 we can see that physical appearance components associated to discrimination are disability, visible dental problems, low weight and low height. Contrary to Maranto and Stenoien (2000) and Frieze et al. (1991) we did not find evidence of wage discrimination linked to obesity. One explanation is that our sample does not include the most serious case of obesity (third degree) as appears in these two others studies. In fact, as shown by Maranto and Stenoien (2000), most of the cases related to wage discrimination based on weight is experienced by people with an extreme degree of obesity (100% over standard weight). Young men and women experience wage discrimination for mild obesity (20% over standard weight).

To explain the reasons by which the factors listed above have a negative effect on income we can imagine that most of these physical attributes can be linked to the productivity of a person. Some examples are the variables PHYHAND, THIN and SHORT. Employers may associate these characteristics to low productivity because they can be associated to organic disorders. In order to see that this hypothesis is reasonable we point out here that the opposite variables OBESE1, OBESE2 and TALL are not significant. In fact tallness and obesity can convey the impression of opulence which does not diminish productivity in the general labor market at all. As in the case of baldness, it is also possible that such a characteristic may not be considered a discriminatory factor. Thus, it is possible that these other features can be associated to discrimination only in specific markets where beauty or appearance are associated to productive attributes.

Sachsida et al. (2003), in a study concerning the influence of beauty on salespeople's wages, showed that a woman with a good appearance receives a premium of about 9% in her earnings. Another explanation is that some bad attributes like those related to speech defects, which appear non-significant in Table 2, influence job discrimination. In other words, they may hinder the capacity of an individual to reach a higher position in the labor market[8]. However these two subject are out of the scope of our present research.

We should mention the possibility that some correlations may present simultaneity or bi-causality, mainly to the variable VISIBLE. Someone may have visibly missing teeth because they cannot afford to take care of their teeth. In order to check the existence of endogeneity in respect to the variable VISIBLE we use a specific treatment designed to dealing with this singular case where there exist model that considers the effect of binary endogenous treatment on another endogenous continuous variable based on heckman´s two step consistent estimation or full maximum likelihood[9]. This model can be introduced in the following way. Take firstly a partition of vector of physical attributes $Z = [Z_1, Z_2]$ where Z_1 is the vector of binary endogenous dummy and Z_2 is the set of exogenous attributes of physical appearance. In our case Z_1 is VISIBLE is only variable included in. Then the wage equation model can be rewritten in this way

$$Lnw = \beta_0 + \beta_1 X + \beta_3 W + \beta_4 Z_1 + \beta_5 Z_2 + \varepsilon \qquad (4)$$

[8]For more details about job discrimination see Moranty (2002) and Heywood and Mohanty (1995).

[9]In order to check endogeneity, we also used the Durbin-Wu- Hausman (DWH) test [Wu (1973), Hausman (1978, 1981)][9] that naturally requires the use of instrumental variable. A criticism that one can bring about in relation to the usefulness of DWH test in our case and therefore the application of IV estimator to correct endogeneity bias is that the variable VISIBLE is a dummy variable and it is not correct to perform OLS regression for this variable at the first stage. However, the consistency of IV method does not require the endogenous variables to be continuous; thus endogenous dummies are fine. The results won't be as efficient as with the system estimation using full system, but they will have the advantage (as usual with single-equation methods) of being consistent under a broader range of assumptions than the system estimation results. The only thing you need to be aware of is Wooldridge's recommendation that a heteroskedastic-robust F-statistic is used when interpreting the first-stage regression statistics. See Wooldridge's (2002), p. 92. Then when we performed the Breusch-Pagan test to check heteroskedastic-for the first stage of endogenous dummy regression this test failed to accept the null hypothesis of constant variance for residuals.

$$Z_1 = 1 \text{ if } Z_1^* = \alpha T + u > 0 \qquad (5)$$

where $\varepsilon \sim N(0, sigma)$, $u \sim N(0,1)$, $rho = corr(\varepsilon, u)$, Z_1^* is a selection variable and T is the set of variable used to explain Z_1^*. We have a selection problem if $rho \neq 0$. This implies that Z_1 is not independent from ε. After perform some experiments we select the vector $T = [SMOKER, HEIGHT]$[10]. Regard to the variable SMOKER in accordance with to the science smoking is a habit that causes damages for health and by hypothesis we admit that this variable correlates positively with VISIBLE. On the other hand we adopt the hypothesis there exist positive correlation between height and health, and therefore height may correlates negatively with VISIBLE.

The Table 3 presents the results of wage equation model using the homogeneous treatment for endogenous dummy effect. The column (1) presents the wage equation regression while column (2) shows the selected equation. As one can see although the signs of the variables of this equation is in according to the commentaries we posed above the log likelihood test does not reject the null hypothesis that the $RHO = 0$, i. e., this means that these two equation are not correlated. Therefore,

In accordance to our procedure we do not observe there exist any problem of endogeneity related to the variable VISIBLE and the OLS estimator does not present biased for wage equation.

Finally, in columns (3) and (4) of Table 2 one can see the results related to the dummies of a person's bad appearance. As we said before, these dummies were included in order to isolate some independent effects that emerge from the presence of two or three negative attributes in the same person. In order to check the hypothesis of the existence of independent effect we estimated a regression with dummies and negative attributes that remain significant in column (2). If there is no independent effect it is necessary that the statistic link to multicollinearity be high because the information in some negative characteristics was already included in the dummies. This is not the case, however, because the statistic VIF is very small. This is an indication that there is no problem of multicollinearity in regression. Our study reveals that the independent effect emerges only in the presence of at least three negative attributes.

Table 3
Treatment for Endogenous Dummy effect

Independent Variables	**(1) Wage Equation** LnW		**(2) Selection Equation** Z_1^*	
Productivity	**Coef.**	**P-Value**	**Coef.**	**P-Value**
CONSTANT	5.702	0.000	-	-
SCHOOLING	0.111	0.000	-	-
EXP	0.032	0.000	-	-
EXP2	-0.002	0.000	-	-
Individual Characteristics				
MARSTAT	0.767	0.056	-	-
RACE	-0.081	0.033	-	-
Appearance (Components)				
PHYHAND	-0.358	0.021	-	-
VISIBLE	-0.612	0.003	-	-
THIN	-0.179	0.003	-	-

[10] SMOKER is a dummy that assumes value 1 if individual is smoke and 0 otherwise.

SHORT	-0.182	0.000	-	-
T=regressors for Selection equation				
SMOKER	-	-	0.065	0.005
HEIGHT	-	-	-1.371	0.028
Wald Chi	179.39	0.000	17.65	0.000
Log Likelihood	-701.23			
RHO	0.48			
LR test (RHO=0)	Chi(1)=1.57 Prob> Chi2=0.21			
OBS	686			

VI. Final Comments

As we have mentioned, our concept of appearance is derived from an individual's characteristics and not subjective feelings. As stated before, the earlier seminal studies [Hamermesh and Biddle, 1994; Biddle and Hamermesh, 1998] are based on the concept of beauty associated to facial attractiveness which people ranked through photographs. However, we can mention at least two elements of debility linked to the criterion of beauty used in these studies. First, we cannot limit the beauty of people to facial attractiveness. Second, the patterns of subjective criteria associated to beauty in society change over time. In view of this we state that our criterion of physical appearance is more robust than the criterion of beauty applied in studies mentioned above.

This study, which was a continuation of the line of research begun by Hamermesh and Biddle (1994), tried to verify the influence of physical appearance on an individuals' wage. We define physical appearance based on a model where the appearance variables were considered separately, where appearance is seen as a subset of an individual's characteristics. To do this, an original dataset in Brazil was especially collected using individual residents from the city of Brasília-DF (Brazil). The main conclusion of this research is that some attributes of physical appearance affect an individual’s wage. These variables are associated in order of importance to disability, low weight and low height, and visible dental problems. The results obtained seem to indicate that the demand for a “good appearance" seen in a great part of employment advertisements is in fact effective and not subjective data, as at first it could seem.

Finally, another important point that deserves attention in future research is if the appearance has influence on job selection. That is, maybe appearance can affect not only wage discrimination but also an employer's hiring decision.

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