EFFECTS OF RACIAL DISCRIMINATION ON HIGH SCHOOL PERFORMANCE AND COLLEGE ADMISSION IN BRAZIL

by

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This research uses national survey data from the Exame Nacional do Ensino Médio (National Secondary Education Exam - ENEM) in Brazil to explore the impact of racial discrimination on high school students between 2004 and 2008. The analysis shows that being a victim of racism can reduce a student's ENEM scores, as well as diminish the perceived quality of their education. These results suggest that racial discrimination in the school environment can be detrimental to the learning experience and to educational attainment. In addition, the study analyzes the characteristics of students admitted to the University of São Paulo (USP) and finds a great racial disparity in acceptance rates. Those accepted at the University of São Paulo are more likely to be white, to come from high income families, to come from private high schools, to enroll in *cursinho* (prep course) and to have a mother with high educational attainment. Thus, the study concludes that higher education in Brazil is synonymous with elitism and that the lack of accessibility by the general population is an impediment to social mobility, especially to Afro-descendants. This work provides a valuable contribution to both race relation studies and educational attainment research in Brazil and it paves the way for future research on the recent implementation of affirmative action policies in federal Brazilian universities.

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CHAPTER 1

INTRODUCTION

> I am against education as an exclusive mechanism to form an elite, keeping the majority of the [Brazilian] population in a state of illiteracy and ignorance.
>
> –Anísio Teixeira, lawyer, intellectual, educator and writer
> *O Jornal*, 1958 [Teixeira, 1958].

Access to higher education in Brazil is particularly inaccessible to lower socioeconomic groups composed mostly of African descents. Although the Brazilian government has argued for many years that Brazil is a racial democracy it is evident in the literature that Afro-Brazilians' descendants do not have a fair opportunity to attend the university of their choice. I propose to explore this issue using a very rich Brazilian data set that has not yet been used to measure racial discrimination.

Admission to Brazilian universities is determined by an entrance exam called the *vestibular*. The *vestibular* is unique to each institution and candidates are selected based on academic performance on this exam alone. The exam is highly competitive in public universities since they are tuition free, with even greater competition for prestigious disciplines such as medicine, law and engineering [INEP, 2004].

This creates a cruel paradox because given the highly competitive nature of the *vestibular* it is very hard to enter a public university and receive a free college education without having previously received a private high school education [McCowan, 2007]. As a result, access is limited to the higher socioeconomic groups, resulting in a great racial inequity with low representation of African Brazilians and indigenous peoples [INEP, 2003; McCowan, 2007]. According to the National Census of 2000, African descendants make up 46.5 percent of the

Brazilian population, however, when looking at the higher education census one finds that they represent fewer than 20 percent of the students attending Brazilian universities [IBGE, 2000].

In 1998, the Ministry of Education created the *Exame Nacional do Ensino Médio* (National Examination of Secondary Education - ENEM). The exam was created to analyze the academic performance of students finishing secondary education, as well as, the overall quality of high school education in Brazil. It is given to seniors or students who have already graduated from high school. The goal was to eventually replace the *vestibular* with the ENEM examination in all public universities. In 2009 the *Sistema de Seleção Unificada* or SISU was developed by the Brazilian Ministry of Education to select a number of candidates to public universities using the ENEM score as the only admission criteria, however, just a few institutions have adopted SISU. The Federal University of Rio de Janeiro has adopted this measure, designating 3,600 slots to students in the SISU [UOL Notícias, 2011] [Brazilian Ministry of Education, 2011]. However, there is only a total of 30,548 slots offered to students through the SISU and only a few institutions are part of this program [Brazilian Ministry of Education, 2011]. Prestigious universities such as the University of São Paulo and University of Campinas, are not part of the SISU program but, like most universities, they do provide bonus points in the *vestibular* for students who performed well on the ENEM exam.

This study aims to look at the effects of discrimination in Brazil in the secondary and higher educational sectors. Racial discrimination is a serious problem at different levels of education in Brazil, and is negatively associated with the student's perception of the learning environment. Schools, after the immediate family, are still considered very important to socialization, as well as to the human development of the individuals [Asinelli-Luz and Cunha, 2011]. Discrimination can be any behavior that makes the school campus an uncomfortable place; that creates an environment that is hostile to a minority group in general, or just to

one person because of her or his race, ethnicity, gender, sexual orientation, disabilities or socioeconomic status.

The learning environment in a school ought not to be a place where students are differentiated simply because of their race, gender, sexual orientation, ethnicity or socioeconomic status. Instead, schools should be a safe zone, where mutual respect is expected and differences are respected. Regardless of the reason, any type of discrimination can be disruptive to the student's learning objectives. The purpose of this study is to analyze the effect that racial discrimination has on the student's quality of education and grade on the ENEM examination. The hypothesis is that students who are racially discriminated against will have a more negative experience in high school than students who are not. In addition, because the learning environment becomes a hostile place for students who are discriminated against, I hypothesize that this will result in lower ENEM scores.

The main questions to be explored are the following:

1. Does racial discrimination affect the overall quality of the learning environment in high schools?

2. Is there any evidence that racial discrimination decreases grades achieved in the ENEM exam?

3. Is there any evidence that racial discrimination has an impact on college admission?

The answers to these questions are essential if Brazil is to truly become a racial democracy. Before outlining the specifics of this study, however, it is necessary to understand race relations in Brazil and how higher education has been the privilege of a few. Chapter 2 therefore reviews the literature on the impact of race, race relations, and opportunities in higher education. Chapter 3 focuses on the proposed study, discussing the model, the key hypotheses, and the variables to be used. Chapter 4 is devoted to empirical estimation of

the model and its results. Chapter 5 looks at the characteristics of students approved at the University of São Paulo by comparing their ENEM score to the national dataset and Chapter 6 draws together the main conclusions.

CHAPTER 2

DISCRIMINATION AND EDUCATIONAL OPPORTUNITY IN BRAZIL

> The history of Brazil is a history that has been written by whites, for whites, just as all of her economic, socio-cultural, military and political structures have been usurped by whites for whites.
>
> –Abdias Nascimento, Brazil: Mixture or Massacre?
> Essays on the Genocide of a Black People, 1989, 2-3 [Nascimento, 1989].

2.1 Discrimination in Brazil

Social status in Brazil is not just a function of wealth or occupation. It is also a matter of race [Skidmore and Smith, 1997]. Historically in Brazil, European colonists and their descendants enslaved and imported eleven times as many Africans as the United States [Telles, 2004]. In the late nineteenth and early twentieth centuries Brazil also received millions of immigrants from Europe and since then, light-skinned descendants have come to dominate their darker-skinned compatriots through discriminatory practices [Telles, 2004].

In Brazil, there tends to be a strong correlation between race and social standing: most on the top are white, most blacks are on the bottom, and mixed-bloods are largely in between [Skidmore and Smith, 1997]. Unlike in the United States, race in Brazil refers mostly to skin color or physical appearance rather than to ancestry. Since race is not purely defined on biological grounds, it is open to interpretation [Skidmore and Smith, 1997]. This concept of Brazilian race allows for multiple interpretations of certain characteristics that complicate the distinguishing of those on the border of whiteness and brownness [Reiter and Mitchell, 2010]. To be black in Brazil one has to be totally black, in contrast to the United States where partly black in ethnic origin means being black. Therefore *mulatos*, *mestiços* and

morenos, which are all different mixtures of whites and blacks, have a greater opportunity for upward mobility than blacks; however, they also suffer from prejudice and bias.

Gilberto Freyre (1933) argued that Brazil's continual miscegenation between whites, African slaves and indigenous peoples was going to lead to a "meta-race" [Freyre, 1933], the "Brazilian race". This created the myth of *democracia racial* or racial democracy, the belief that Brazil has escaped racism due to miscegenation. As a result, racism became a taboo subject in Brazil. Brazilians imagine themselves as living in an anti-racist nation and take pride in it, since it is proof of their status as a civilized nation [Guimarães, 1995]. According to Nascimento (1989, 59),

> Brazil as a nation proclaims herself to be the only racial democracy in the world, and much of the world views and accepts her as such. But an examination of the historical development of my country reveals the true nature of her social, cultural, political and economic anatomy: it is essentially racist and vitally threatening to black people. [Nascimento, 1989]

Similarly, Skidmore (1974) argues that the white elite promoted the myth of racial democracy to obscure very real forms of racial oppression.

The Brazilian state avoided any explicit race-based intervention, against or in favor of blacks, for nearly a century [Telles, 2004]. During this time, the elite placed its faith in *branqueamento* (whitening), presumed to be the inevitable result of miscegenation, with the unequivocally racist intention of purging Brazil of the presumably negative influence of black blood [Skidmore and Smith, 1997]. The Brazilian government not only promoted, but subsidized the immigration of Italians, Germans, Portuguese and Spanish in order to whiten the country and avoid the consolidation of an Afro-Brazilian majority after slavery [Johnson, 2008]. The white elite that stimulated European immigration held strong negative and racist views about blacks. In fact according to Johnson (2008), fear of the impact that blacks would have on the country's progress contributed to the push for immigration. Attitudes based on the slave past and post emancipation white racist views contributed to the widespread

public and private, formal and informal images of blacks and blackness as ugly, deficient, suspicious, and less than human [Skidmore, 1993; Schwarcz, 1999]. As a result, many African descendants have accepted the ideal of whitening and the myth of racial democracy, believing that a lighter complexion and more European facial features or hair textures are superior to dark skin and African features [Almeida, 2008].

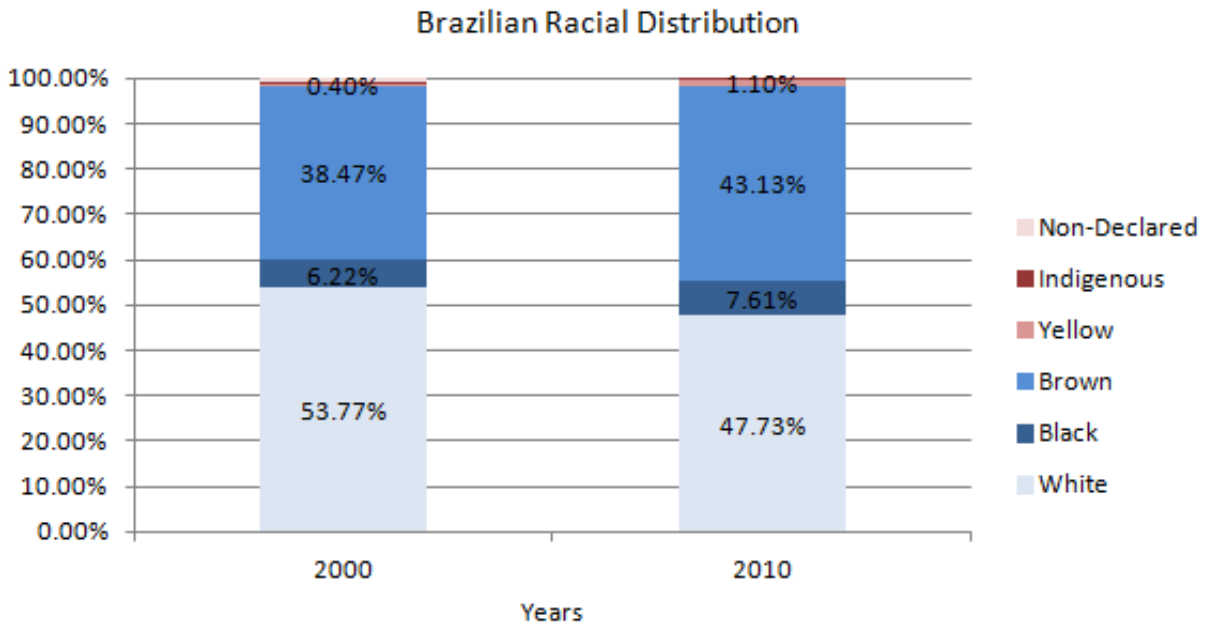

Figure 2.1. Racial Distribution 2000 and 2010 IBGE

Nevertheless, racial discrimination and racial inequality have persisted and race has been consistently used to exclude non-whites throughout Brazil's history, despite rhetoric of inclusion [Telles, 2004]. Several recent studies have shown significant differences in income by race (controlling for all other factors) drawing the conclusion that race is a separate and significant variable in the Brazilian socio-economic system [Skidmore and Smith, 1997].

When discussing racial discrimination in the school environment, one not only alludes to exclusion because of race, but also to bullying practices against a race group. Race-based bullying is a serious form of racial discrimination that may consist of physical violence, verbal

assaults or excluding a classmate from group activities or ignoring the classmate. Although racial bullying has received attention in developed countries, only one study was found that examined bullying in Brazilian high school [DeSouza and Ribeiro, 2005]. However, this study used a very small cross-sectional dataset (n=400), sampling students from two schools on-line. Thus it suffers from external validity problems.

Ethnic bullying should be of a particular worry in multi-racial communities like Brazil [Smith, 2002]. However, most of the studies of racial bullying are still divided on whether ethnic differences cause bullying. While a study in Australia found no ethnic differences in incidence of bullying [Nguy and Hunt, 2004] another in England found more victimization of Asian students than of students of traditional English heritage [Eslea and Mukhtar, 2000]. A study in the U.S. found that only 8 percent of bullied adolescents thought that their race or religion was the reason for bullying [Nansel et al., 2001].

A related hypothesis in the literature is that socio-economic status creates bullies or victims [Berger, 2007]. Again, the literature is mixed. While a study of Dutch children found no economic differences [Veenstra et al., 2005] another in Portugal found that lower income students were more often bullied and victimized [Pereira et al., 2004]. A simple statistical summary of my dataset will allow me to see whether students from lower socio-economic status are more likely to be victims of racial discrimination than students from higher income families in Brazil.

The purpose of this study is to examine racial discrimination, which includes racial bullying, among seniors graduating from Brazilian high schools. The main advantage of this study is that the dataset is very rich and one is able to analyze the attitudes and perceptions of almost 3 million students. At the present time, I am unaware of any published studies on racial discrimination or racial bullying in Brazil using the dataset here presented. It is important to point out that the main goal of this study is not to find out the causes of racial

discrimination, rather the effect that it has on student's learning abilities and perception of the quality of their education.

2.2 Discrimination and Educational Opportunity

Education has long been viewed as a key factor in the pursuit of both democracy and development. The lack of education is a factor that limits the development of a group within their own society and helps maintain overall inequality [Beltrão and Novellino, 2002]. Thus it is important to understand how Afro-Brazilians were excluded from higher education and alienated within their own society in order to explain the racial disparities seen in Brazil today.

Stohl and Lopez (1984) pointed out that institutions created during Brazil's Iberian colonization gave rise to a style of governance in which only a few European descendants had great power and wealth in their hands while the Afro-descendants, although the majority, were non-participants exploited by the elite [Stohl and Lopez, 1984]. When most institutions were created in Brazil, the Afro-Brazilians were slaves and did not have access to wealth or political positions, and as a consequence, blacks and people of dark skin are still at the bottom of the social ladder. Carlos Hasenbalg (1979) argued that in regards to social mobility, the differences between blacks and whites are due to discriminatory circumstances that emerged after the abolition of slavery in Brazil. Opportunities were not equally distributed, and the massive migration of Europeans resulted in the marginalization of former slaves [Hasenbalg and Burglin, 1979]. Today, the Brazilian educational system provides clear evidence that opportunities for ascension are still discriminatory, since it is not equally distributed in the society, and studies have shown that despite democratization of access to education at lower levels, access to higher education is racially unequal, even after controlling for education of parents [Ribeiro, 2006].

In the 20th century, private education became the preferred option for the children of elite groups. There is clear evidence in the literature showing that the overall performance of students in public schools is much inferior to students in private schools [Guimarães and Sampaio, 2007; Akkari, 2001]. The reason is in the many flaws and qualitative as well as quantitative weaknesses of public education [Akkari, 2001]. The present educational system in Brazil is fragmented and organized in different regions in different patterns [Akkari, 2001]. The fact that a student studies in a private school indicates his/her economic status, and is positively related to the level of his/her parents' education. The income of a student's family at a private school is on average three times the income of a student in a public school and parents of children in a private school have on average four or more years of education than the parents of children in a public school. These two factors result in a favorable environment for the intellectual development of the higher status student [Guimarães and Sampaio, 2007]. In addition, families who take their children from public high school and enroll them in private high school greatly enhance their children's chances of passing the *vestibular* [Castro, 1997]. It is clear that there is a great disparity between the material, curriculum, quality and infrastructure of public and private school facilities in Brazil. As a result one can see a great social and racial disparity in the education system in Brazil and its contribution to social inequality [Cunha, 1985; Cury, 1989; Saviani, 2005; Guimarães and Sampaio, 2009]. Researchers like Cury (1989) and Guimarães and Sampaio (2009) have denounced this disparity between the public and private sector, stressing that educational opportunity has become stratified by social class. They argue that the state is giving power to hegemonic groups in Brazilian society and not allowing access to participation for the poorer groups by making it difficult for them to go to college and eventually move up the social status ladder [Cury, 1989].

What is even more problematic is the racial disparity among students from public and private schools. The families of students in private school have higher income and the

percentage of whites and blacks is respectively 56.58 percent and 5.63 percent, with 32 percent being brown. In public school the percentage is 13.6 percent for black, 34 percent for white and 45 percent for brown [Guimarães and Sampaio, 2007]. As argued by these authors, there is clear evidence that the performance of students in public schools is much inferior to students in private schools [Guimarães and Sampaio, 2007]. The majority of students who attend public schools are non-whites and as a consequence of the lack of quality in public schools they perform below the average on the *vestibular* and are not admitted into public universities [Telles, 2004]. Therefore wealthy students, because of their superior private pre-college education, get into the best universities, and these are public. Wealthy students are also admitted disproportionately into the more prestigious and financially rewarding disciplines such as medicine, law and engineering [Telles, 2004]. When they are admitted to prestigious universities, poorer and non-white students are more likely to be sorted into fields, such as education and the humanities. When they are not, poorer students often must pay for their education in an inferior expensive private college [Telles, 2004] and in most cases they enter the labor force and give up pursuing a higher education. Thus, having the majority of black and brown students in the public sector is very disturbing when the literature suggests that they will not perform as well in the vestibular as the students from the private sector who are mostly whites.

Due to the large number of black and dark-skinned students in the public schools and the fact that most of them will not go to college because of the difficulty of the *vestibular*, in 2001 the Brazilian government, hoping to address racial inequality, implemented affirmative action. This caused huge controversy because, as Mala Htun (2004) argues, Brazilians have thought of themselves not as people of distinct races but as multi-coloured national race. Htun (2004) argues that even though politicians overwhelmingly ignored the issue in the past, the policy was passed because of the great number of people that were convinced by the idea that racism is pervasive and something needed to be done about racial inequality.

Blacks are almost never seen amidst the country's political, economic, and media elite. In the Brazilian Congress, for example, only 9 out of 513 deputies (2 percent) actively identified themselves as black in 2003 [Htun, 2004]. This is a direct result of the lack of superior education and lack of opportunity for blacks and people of dark skin. Only by having access to universities will they be able to move up the social ladder and break the poverty cycle they have been trapped in.

Some scholars have deemed affirmative action to be inappropriate for Brazil's style of racism, which is not structural. Correa Coelho (2001) has argued that racist acts should be punished, but that the problem requires social policies directed at the poor not at a race group [Correa Coelho, 2001]. De Goes (2001) argues that many fear that quotas are based on U.S. race relations and policy, and that they will introduce a false racial division to Brazil that would generate greater injustice. However, injustice against Afro-Brazilians is evident in many sectors of the society, and many have deemed the measure appropriate. As scholar Peter Fry (2000, 100) said:

> For the first time since the abolition of slavery the Brazilian government has not only recognized the existence and inequity of racism but has chosen to contemplate the passage of legislation that recognizes the existence and importance of distinct racial communities in Brazil. [Fry, 2000]

In addition, former President Fernando Henrique Cardoso was a major supporter of the policy. Cardoso's Ph.D. dissertation as a sociologist explored race relations in Brazil. During a public speech in December 19, 2001 he said:

> Everyone knows that this is an issue I'm very involved in, because I spent several years of my life at the beginning of my career as a sociologist studying blacks and racial discrimination among the poorest sectors of the country. From São Paulo to Rio Grande do Sul, at that time, the 1950s, I don't think there was a *favela* that I didn't visit, not just to study, but also to portray a Brazilian reality that elites ignored in those days. Brazilians' lives [were] wrapped in the illusion that this was a perfect racial democracy when it was not, when even today it isn't. [Cardoso, December 19, 2001]

Never before had a president recognized that Brazil was not a racial democracy and denounced the prejudice against blacks publicly. The Brazilian state avoided any explicit race-base intervention, against or in favor of blacks, for nearly a century [Telles, 2004]. Nevertheless, racial discrimination and racial inequality have persisted and race has been consistently used to exclude non-whites throughout Brazil's history, despite rhetoric about inclusion [Telles, 2004]. The main problem with race-based policies is with those who lie in the middle of the color spectrum and are defined as *morenos* (browns with lighter-skin) or *mulatos* (browns with darker-skin). However, a claim for blackness must be accepted since there is no rule about who is black in Brazil [Telles, 2004].

The passionate reactions against affirmative action in Brazil show a picture of the struggle over inherited and normalized privilege, as many white Brazilians perceive their access to free university education not as a privilege exercised over centuries and bought with the exclusion of the non-white majority, but as their right [Reiter and Mitchell, 2010]. The truth is that to become democratic and to rescue the dignity of those who have unfairly been privileged, and thus save the moral grounding of the entire community, more and more Brazilians have begun to openly address the injustices produced by racism [Reiter and Mitchell, 2010]. Those against policies such as affirmative action need to realize that defending historically inherited privilege has no moral grounding and can only lead to social inequality.

Today, most students who graduate from public high school in Brazil are never going to be able to attend college. The fierce competition of the *vestibular* examination in public universities and lack of financial means to have a private college education, make access to college a far away dream. Furthermore, opportunities for black students are slim in Brazil, as the ideal of racial democracy proves to be a founding myth of Brazilian nationality and can only be denounced as myth [Guimarães, 1995]. Studies by Andrews [1992]; Guimarães [2003]; Hasenbalg and Burglin [1979]; Lovell [1989]; Silva [1980]; Telles [1992, 2004] and many others reveal the truth behind Brazilian racial democracy. They show profound inequalities

that separate blacks from other groups and reveal a *de facto* job, residential, and educational segregation between white and non-white in Brazil.

2.3 A Closer look at the ENEM

In 1998, the *Exame National do Ensino Médio* (The National Exam of Secondary Education-ENEM) was created to assess the performance of students as they conclude high school and analyze the quality of their education and whether or not the schools had prepared their students for college. Before the ENEM examination, the only way of assessing high school's was through graduation rates.

The ENEM exam is given yearly to graduating seniors and high school graduate students in Brazil. The exam was created by the *Instituto Nacional de Estudos e Pesquisas Educacionais* (National Institute of Studies and Educational Research- INEP). From 1998 to 2008 the exam was divided into two parts: an objective part with 63 multiple choice questions, and an essay part. However, in 2009 after the *Sistema de Seleção Unificada* or SISU was developed by the Brazilian Ministry of Education to select a number of candidates to public universities using the ENEM exam as the only admission criteria, the exam changed and now has 180 multiple choice questions in five main areas: natural sciences, human sciences, math, Portuguese, foreign language and an essay [Brazilian Ministry of Education, 2011]. Since 2001, many universities have used the ENEM as a bonus to the *vestibular*. With the SISU program, some public universities like the the Federal University of Rio de Janeiro abolished the *vestibular* and use ENEM as its only admission exam. Although the ENEM is not a mandatory exam, as universities started to give bonuses on the vestibular to students who performed well on the ENEM, the number of students taking the exam grew rapidly as shown in Table 2.1 and grew drastically after the implementation of the SISU program in 2009.

Table 2.1. Number of students registered per year

Year	Students Registered
2012	6,497,466
2011	6,221,697
2010	4,611,441
2009	4,576,126
2008	4,018,070
2007	3,568,592
2006	3,742,827
2005	3,004,491
2004	1,552,316
2003	1,882,393
2002	1,829,170
2001	1,624,131
2000	390,180
1999	346,953
1998	157,221

The National Institute of Studies and Educational Research (INEP) provides a rich data resource available on-line using the individual students who take the ENEM examination as units of analysis. The data include the scores that each individual made on the ENEM as well as the answers to a socio-economic questionnaire which contains three main objectives: to learn the socio-economic status of the students and their families, to know the perception of students regarding their high school education, and to learn the students' opinions on general subjects, their interests and future plans.

Many researchers have used this dataset to analyze different aspects of the student's life and perceptions during high school. Asinelli-Luz and Cunha (2011) used the dataset to learn the perceptions of homophobic discrimination among High School graduates in Brazil from 2004 to 2008. Their research found that students who were discriminated against said that their overall high school experience was much more negative than students who had

not been discriminated against because of their sexual orientation [Asinelli-Luz and Cunha, 2011]. This was the only study in the literature that used the ENEM database to see the perception of students regarding a specific type of discrimination in high school. With such a vast and rich dataset, it would be possible to analyze racial discrimination and attitudes towards people of different color and ethnicity in Brazil using the same dataset.

This gives rise to the following research questions:

1. What were the perceptions of racism among high school graduates in Brazil from 2004 to 2008?

2. Is there evidence to support the argument that racial discrimination causes students to have a more negative high school experience compared to those who were not discriminated against?

3. Holding quality of education and socio-economic status constant, do students who were discriminated against perform below the average on the ENEM?

There are several questions in the questionnaire that will allow us to answer these questions including:

1. Do you consider yourself racist?

2. Are your parents racists?

3. Are your neighbors racists?

4. Are your classmates or workmates racists?

5. Have you ever suffered racial, ethnicity or color discrimination?

6. Have you ever seen someone being discriminated against because of their race color or ethnicity?

Responses to these questions allow us to look at racism through three different lenses: the victim of discrimination, the witness of discrimination, and those that consider themselves racists and would prefer not to be involved with people of other color or ethnicity. The ENEM database allows for comparison between different sectors, e.g type of schools (public vs. private), as well as between regions (*municípios*), allowing us to see where racism is more prevalent.

2.4 Data Availability and Source

The dataset that I will use to test my hypotheses was created by the National Institute of Educational Research (INEP). It is a socio-economic questionnaire that provides yearly data on the students who took the ENEM examination.

The dataset has individual students' answers to the socio-economic questionnaire, as well as their score on the ENEM, permitting students to be used as the unit of analysis. Data for the years of 2004 to 2008 are available on-line to download and are used in the investigation.[1]

[1]The rough data can be found at: http://portal.inep.gove.br/basica-levantamentos-acessar [INEP, 2008]

CHAPTER 3

MODEL SPECIFICATION AND VARIABLE SELECTION

> The years of racial oppression in the slave-owner Brazilian society, left scars that reflect in the discrimination of Afro-descendants.[...] The injustice of the system is absolutely intolerable.
>
> –Luiz Fux, Justice of the Brazilian Supreme Court
> Deliberation on Affirmative Action Decision, 2012 [Lux, 2012].

The purpose of this study is to determine how racial discrimination affects the quality of education and ENEM score. Since educational quality and performance on the ENEM examination also may be affected by, other variables, the effect if discrimination is explored in the context of several control variables including race, age, geographic region, gender, family income, parent's educational level, and type of school (public vs. private). Because I am suggesting that discriminated students have a more negative experience in high school and lower test scores, the hypothesized causal relationship runs from discrimination to test score and experience. Thus, I run the model twice to address two tentative hypotheses:

1. Discriminated students have a more negative experience in high school than students not discriminated, other things being equal.

2. Discriminated students have lower ENEM scores than students who were not discriminated, other things being equal.

This allows me to look at the effect that discrimination has on the students' performance at the ENEM examination.

Then using data provided by the University of São Paulo (USP), I look at the characteristics of students who were admitted to USP and how they compare with students who

took the ENEM examination. I am able to do that by looking at the average ENEM score of students who were accepted into USP, and compare that against other characteristics that I controlled for in my examination. Thus, I am able to see if race plays any role in college admission.

The two models tested therefore have the following form:

$$Quality_i = \mathbf{X}_{im}\beta_{im} + \epsilon_i \tag{3.1}$$

The dependent variable $Quality_i$ is a measure based on individual responses to the question *"What score would you give to the overall experience you had in high school?"* Students were asked to give a score ranging from 0 (low) to 10 (high). This first model, analyzes the perception of quality of education and how it is affected by different independent variables in the X matrix.

The second model is:

$$GradeENEM_i = \mathbf{X}_{im}\beta_{im} + \epsilon_i \tag{3.2}$$

The dependent variable $GradeENEM_i$ is composed of the individual's score on the objective part of the ENEM exam that had 63 questions worth 100 points. The performance is divided in four categories: $1 = insufficient$ (scores between 0 and 20 included), $2 = regular$ (scores between 20 and 55 included), $3 = good$ (scores between 55 and 85 included) and $4 = excellent$ (scores between 85 and 100 included). This second model analyzes how the performance of students on the ENEM score is affected by different independent variables in the X matrix.

The main independent variable is measured based on the answers to the question *"Have you ever suffered racial or ethnic discrimination?"* (coded $1 = yes$, $0 = no$). Social scientists have acknowledged that measuring racial discrimination is not an easy task, Pager and Shep-

herd (2008) argue that racial discrimination is a fascinating yet frustrating topic because of the evasiveness of its measures [Pager and Shepherd, 2008]. In this study, racial discrimination is measured by the perception that students had of being discriminated against or not, captured by their answers to that particular survey question and through statistical analyzes. Although relying on perceptions can underestimate or overestimate discrimination they are an important way to capture cognitions, norms and values [Pager and Shepherd, 2008; da Silva and Reis, 2011]. Racial discrimination is also measured indirectly by comparing racial groups performance on the ENEM exam.

The data used to estimate Model 3.1 and Model 3.2 comprises a questionnaire given to $i = 7.5$ million students before taking the ENEM exam. The questionnaire was designed by the *Instituto Nacional de Estudos e Pesquisa* [INEP, 2008]. The observations are all high school graduates who took the ENEM examination throughout the 27 states of Brazil during 2004-2008. These data are filtered and only students with the following characteristics are analyzed: (1) students who completed the Socio-Economic Questionnaire, (2) took the objective section of the exam, and (3) graduated during the 3 years prior to taking the exam or will graduate on the year of the exam or after. After filtering the data, the number of students was still very large since a period of 5 years is covered.

The matrix $\mathbf{X}$ contains up to $m = 18$ student level variables shown to be associated with high scores and quality of education. They are listed in Table 3.1.

3.1 The Socio-Economic Questionnaire and Participants

Table 3.2 provides a summary of the students background characteristics. All students are required to fill out a socio-economic questionnaire upon registering for the ENEM exam. The Socio-Economic Questionnaire was created and designed by the *Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira* (INEP) in cooperation with the Brazilian

Table 3.1. Student-level variables included in **X**.

Variable	**Definition and Source**
	Instituto Nacional de Estudos e Pequisas
Victim	Have you ever suffered racial or ethnic discrimination? 1(yes); 0(no)
Witness	Have you ever witnessed racial or ethnical discrimination? 1(yes); 0(no)
Racist	Do you consider yourself racist? 1(yes); 0(no)
Racist environment	
Home	Are your parents and/or friends racist? 1(yes); 0(no)
School	Are your classmates racists? 1(yes); 0(no)
Neighborhood	Are your neighbors or acquaintances in general racist? 1(yes); 0(no)
Non-white	Non-white (Black, Mulatto): 1(yes); 0(white)
Female	1(female); 0(male)
Age	Student's age
Family Income	All wages and other incomes by monthly minimum wage: 0 (low) to 7(high)
Public School	Type of high school attended: 1(public school); 0(private school)
Prep Course	Did you do a preparatory course for the vestibular examination? 1(yes); 0(no)
Father education	
High School Graduate	1(yes); 0(otherwise)
Some College	1(yes); 0(otherwise)
College Graduate	1(yes); 0(otherwise)
Unknown	Student do not know father education 1(yes); 0(otherwise)
Mother education	
High School Graduate	1(yes); 0(otherwise)
Some College	1(yes); 0(otherwise)
College Graduate	1(yes); 0(otherwise)
Unknown	Student do not know mother education 1(yes); 0(otherwise)
Married	1 (married or living together as married); 0(otherwise)
Children	1(have children); 0(no children)
Work	Did you work during high school? 1(yes); 0(no)
Southeast	If students are from the following states: SP, RJ, MG and ES 1(yes); 0(no)
Urban	Location of school 1(urban); 0(rural)
Favela	
Pavement	Is your house on a paved street? 1(no); 0(yes)
Water	Does your house have running water? 1(no); 0(yes)
Location	Urban

Ministry of Education. The INEP allows anyone to download the questionnaire for each year, along with a codebook, the raw data, the ENEM exams and solutions for each year at their website (www.inep.gov.br). Although the ENEM Socio-Economic Questionnaire has changed over the years, for the years of 2004-2008 all questions relevant for this dissertation were exactly the same. Once the student registers for the ENEM exam, a Socio-Economic questionnaire along with a Student Manual is sent to the candidate's home. The students are asked to fill out the questionnaire and turn it in at the place of the examination before taking the ENEM exam. The Questionnaires for the years of 2004-2008 have a total of 223 multi-choice questions, divided into five sections: 'You and Family', 'You and Work', 'You and School', 'Values', and an extra section only for students who had already graduated high school. In 2010, the socio-economic questionnaire was drastically changed and reduced to only 25 questions. As a result, questions about discrimination were excluded [INEP, 2008].

A total of 7.5 million students registered for the ENEM exam between 2004-2008. However, after filtering the data only 2,489,509 students remained in the study. Respondents had a mean age of 19, with ages ranging from 16 to 26. The sample was 55.46 percent white and 58.7 percent female.

Table 3.2. Background Characteristics of ENEM Students (n=2,489,509)

Variable	**Mean**	**S.D.**
Age	18.8905	2.661729
Non-white	.4453914	.4970091
Female	.587364	.4923085
Married	.0856165	.2797969
Public School	.8930705	.3090237
Family Income	2.459715*	1.104913
Urban	.9840912	.1251226

Family income was divided into eight categories, see section: 'Other Personal and Family Background Characteristics' below for more details.

Looking at the summary statistics for the participants, some interesting patterns appeared. The majority of students who were victims of racial discrimination were non-whites, as illustrated by Figure 3.1. As discussed in Chapter 2, many Brazilians who are of mixed race but look white identify themselves as 'white', which could explain why 33 percent of 'whites' were discriminated against as shown in Figure 3.1.

Students who were victims of racial discrimination seemed to score in lower categories of the ENEM exam as shown by Figure 3.2 and students who were victims of racial discrimination were more likely to give a low score for the quality of their education in high school as illustrated in Figure 3.3.

3.2 What is Discrimination?

Racial discrimination refers to unequal treatment of persons or groups on the basis of their race or ethnicity. There are conceptual differences between discrimination, racism (ideologies), prejudice (attitudes) and negative stereotyping (beliefs) [Pager and Shepherd, 2008]. Brazilians, in general, acknowledge the existence of racial inequality, but not so many are willing to accept the existence of racial discrimination (which would be the active exclusion of blacks from resources and institutions) and racism (the existence of a racial social structure with whites at the top) [da Silva and Reis, 2011]. In this study, both racial discrimination and racism are used as synonyms without distinction. In the two models there are four variables that address the issue of discrimination in Brazilian high schools: *victim*, *witness*, *racist* and *racist environment*. The variable *victim* is basically students who felt that they were racially discriminated in high school. Variable *witness* represents students who saw someone being discriminated against because of their race or ethnicity in the school environment. The variable *racists* are students who claim to be racist as show in Table 3.3.

A chi-square test indicates that there is a statistically significant relationship between racist students and their race (chi-square with one degree of freedom = 166.8628, p = 0.000).

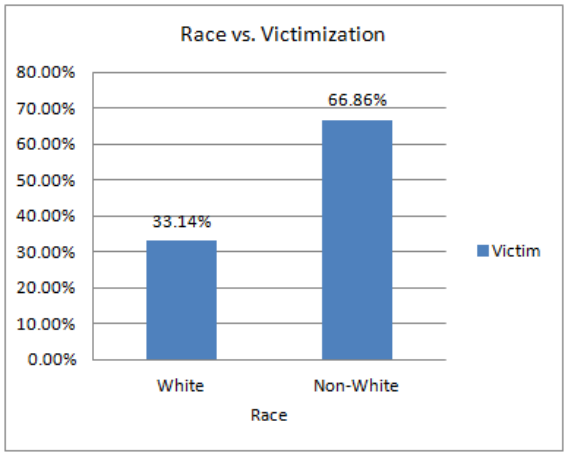

Figure 3.1. Race of Victims

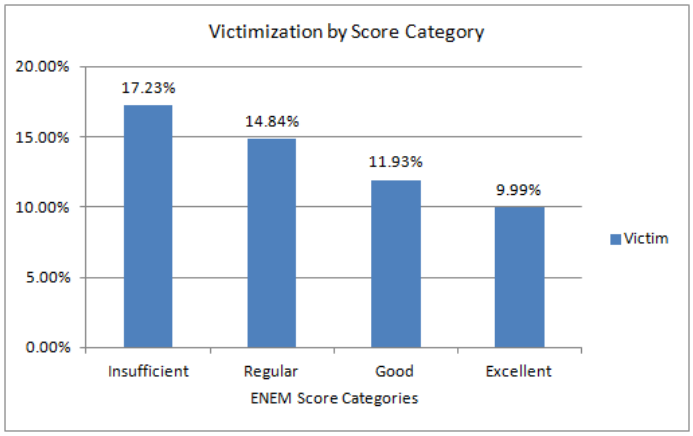

Figure 3.2. Victims by ENEM score

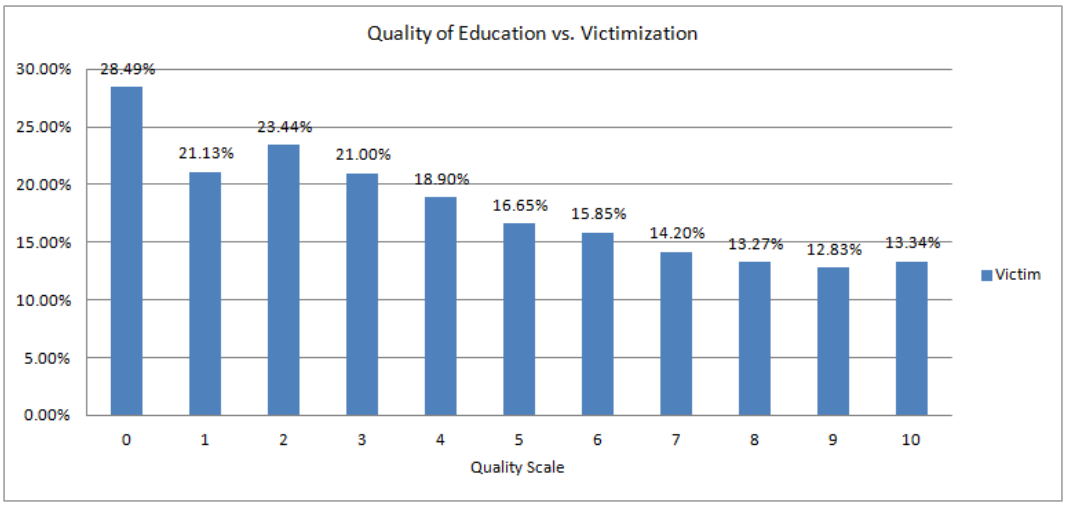

Figure 3.3. Victims Perception of Quality of Education

Table 3.3. Racist Person by Race

Racist Person	White	Non-white	Total
No	1,332,978	1,073,754	2,406,732
Yes	47,725	35,052	82,777
Total	1,380,703	1,108,806	2,489,509

When analyzing the *victim* and *witness* variables, it is important to acknowledge that the perception of being discriminated against can be different from person to person. However, even though perceptions may vary, race is still considered an element of inferiority in the school environment to those identified as black, both public and private schools [Lima et al., 1998; dos Santos Cavalleiro, 2000; Botelho, 2000; Neves, 2002; Cabral, 2007]. Pejorative name calling, sometimes disguised as 'loving' nicknames, identify black students as 'negão, neguinha, negona, nega, aquele moreno, macaco, piche, asfalto, alemão, maizena, xuxa, etc' or 'big black, little black woman, big black woman, nigger, that black, monkey, pitch, tar, german, corn-starch, blond, etc'[1] [Cavalleiro, 2005]. Depending on the student, s/he can find name calling as described above as a 'normal practice' due to frequent occurrence in daily discourse but some can find it offensive.

According to Guimarães (2003) racial insults, as described above, make the insulted person return to an already historically constituted inferior place. The attribution of inferiority consists of apposition of color, as well as negative qualities or properties relating to physical constitution, morality, social organization, habits of hygiene and humanity to a certain group of people considered '*negras*' or '*pretas*' (very black) [Guimarães, 2003]. In Brazil 'racial inferiority' is constituted based on the following stigmas: 'a supposed slave essence; dishonesty and delinquency; precarious housing; moral depravity; lack of religiosity; lack of hygiene; and incivility, bad manners or illiteracy.' These stigmas are repeatedly associated with people's black color [Guimarães, 2003].

[1]The English translation of these slurs are meant to give the reader a very rough idea of meaning, without reproducing the Portuguese colloquial.

In such a hostile school environment, which results in an education that devaluate and disrespect racial diversity in the classrooms, there are few opportunities for success [Silva, 2001; Cavalleiro, 2005]. This indicates that, even in the school environment, black children have to cope and learn to live in racist and discriminatory relations with other students. Because many black students are used to being called a pejorative name, many do not perceive this as discrimination. A survey study by Yvonne Maggie (2006) in twenty-one high schools in Rio de Janeiro observed that racial discrimination mainly happens among students through name calling, swearing, and jokes [Maggie, 2006] and can easily be disguised as 'normal' practice. Reis and Da Silva (2011) argue that although environmental racism (practice by friends, family or neighbours) is common in Brazil, the initial tensions that it causes tend to disappear or at least become silent over time, which might explain why some people do not recognize such incidents as discrimination.

As a result, there is often a disparity between the number of students who felt that they were being discriminated against and students who witness a discriminatory occurrence. In this study the *witness* variable indicates students who claim to have witnessed another student being discriminated against because of their race and ethnicity. The data indicate that non-white students were slightly more likely to say they witnessed discrimination than white students. This supports what Reis and Da Silva (2011) found in their study: African Brazilians often accuse their white friends of being race insensitive and not aware of racial discrimination in everyday life as described in one incident:

> We (interviewee and white university friends) were in a group around a table in a bar, and I was the only black. A friend, who I really like, but on that day was very unpleasant said: 'You are the black with the whitest soul I know,' and that hurt me. I ended up arguing with him and leaving the bar, really upset with him. He called me later, and I tried to explain, but he thought I was joking. And I was not...Since then, nobody has talked about it. This topic is far too sensitive. [da Silva and Reis, 2011]

The data also shows an interesting pattern on the reporting of racial discrimination that appears to be significant. The number of students who said that they saw racial

discrimination was on average five times more than the number of students who admitted to being discriminated against as shown in Figure 3.4.

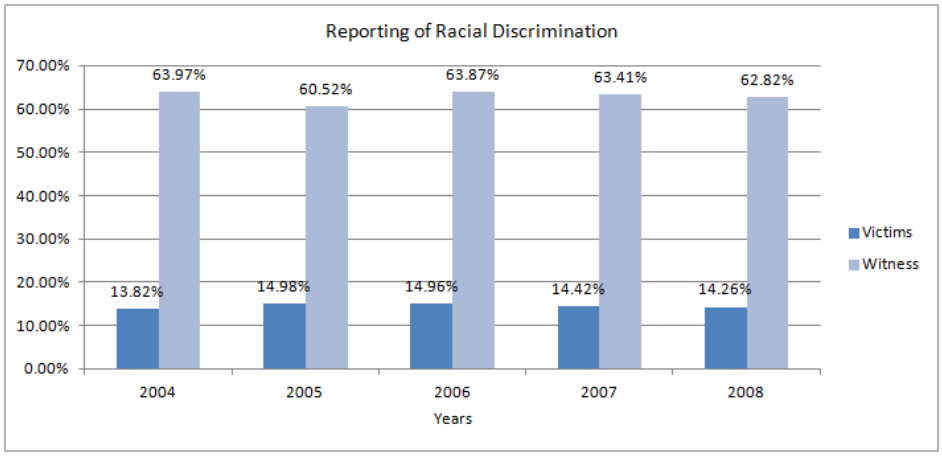

Figure 3.4. Mean for Victims vs. Witnesses per year

This could indicate a huge under-reporting of racial discrimination by the students. Some psychology studies have suggested that because discrimination appears to adversely impact self-esteem and perceptions of control, minority group members, especially those of low status, are likely to minimize and deny experiences of discrimination [Williams et al., 2001; Ruggiero and Taylor, 1997; Ruggiero and Major, 1998; Crosby, 1984].

Evidence was also found to support the Pereira et al. [2004] study which found that lower income students were more often bullied and victims of discrimination [Pereira et al., 2004]. The data indicates that students from lower income households are more likely to be victims of racial discrimination as shown in Figure 3.5, but only to a certain point. Wealthy students, whose family monthly income exceeds fifty minimum monthly wages, roughly an average of R$17,000 *reais*, appear to be more racially discriminated against than other children.

Although the variables *victim*, *witness* and *racist*, are used in the school context, the variable *racist environment* is used outside of the school environment. This variable illustrates whether or not the student lives in a non-discriminatory environment. Regardless of the race of the student, living in a racist environment can affect a student's self-esteem.

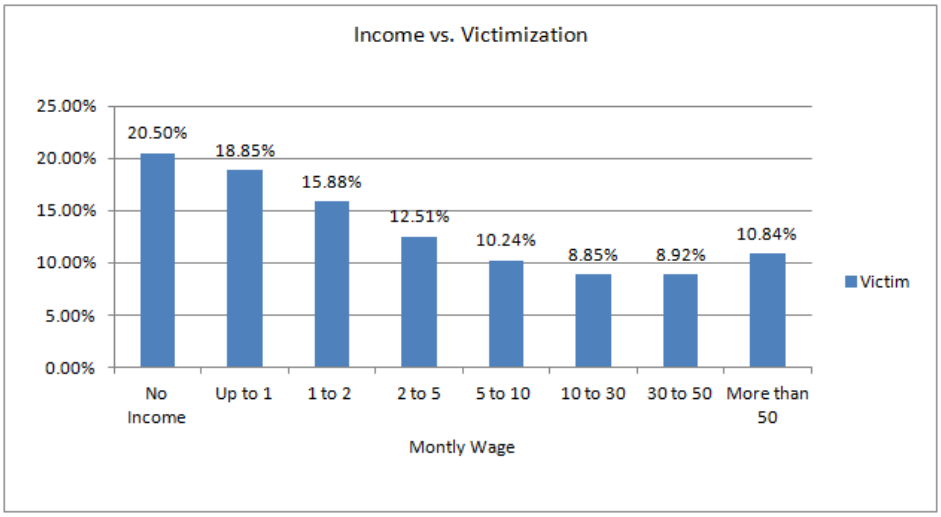

Figure 3.5. Mean for Victims vs. Family Income per year

A study by da Silva and Reis [2011] found that it was very common for blacks to report racism in their own families, or in their partner's family, and although most claimed to have multiracial friendships, they also claimed that some of their friends were racist or racially insensitive. This analysis will be able to indicate whether a racist environment plays a role in students' educational success and experience in high school.

3.3 How to Measure Racial Discrimination?

Extensive research by social scientists trying to address the question of discrimination has resulted in several techniques to isolate and identify its presence and to document its effects [Blank, 2004]. Although every method has limitations, together some of these techniques provide insightful results to help us understand how and to what degree discrimination matters in the lives of African descendants in Brazil. Thus, this study combines both perceptions of discrimination and statistical analysis techniques to measure racial discrimination among students who took the ENEM exam.

3.3.1 Perceptions

One common technique used to measure discrimination involves asking racial minorities about their experience with discrimination in the workplace, school environment, in their search for housing and in other everyday social settings [Schuman, 1997]. These studies produce patterns of discrimination, which are highly important since a study by Kessler et al. [1999] found that those who perceive high levels of discrimination are more likely to experience depression, anxiety and other negative health outcomes. It may also lead to diminished effort or performance in education or the labor market giving rise to negative outcomes [Ogbu, 1991; Steele, 1997; Loury, 2002]. In this study, when analyzing the variable *victim* and *witness* I rely solely on the student's perception of racial discrimination. It is, however, unclear to what extent perceptions of discrimination depict the reality. Studies that use perception to measure racial discrimination may over or underestimate the actual incident of discrimination.

3.3.2 Statistical Analysis

The most common approach to measuring discrimination is by analyzing inequality outcomes between groups. This approach looks to the possible consequences of discrimination in the unequal distribution of housing, employment or other social and economic resources [Pager and Shepherd, 2008]. Using large-scale datasets, like the ENEM database, researchers can identify systematic disparities between groups and predict their direction over time. In statistical models discrimination is measured as the residual race gap in any outcome that remains after controlling for all other race-related influences. The limitation of this approach is that it is difficult to account for many factors relevant to unequal outcomes. There is always a possibility that the disparity attributed to discrimination may in fact be explained by another unmeasured cause. Although this approach is used in this study, it is important to highlight characteristics such as motivation, intelligence, and interpersonal skills that can

be important to achieving higher test scores and to having a better experience in high school that are not measured. These are characteristics that are often difficult to capture with survey data, yet they may be important to the analysis. According to Blank [2004] although statistical models are an important approach to the study of race inequality, researchers should use caution in making causal interpretations of the indirect measures of discrimination derived from residual estimates.

3.3.3 Experimental Approaches

According to Pager and Shepherd [2008] field experiments are very effective in measuring discrimination because they allow researchers to measure causal effects more directly by presenting carefully constructed and controlled comparisons. These experiments, referred to as audit studies, allow researchers to carefully select, match and train individuals to play the part of a job/apartment-seeker or consumer [Pager and Shepherd, 2008]. By presenting equally qualified individuals who differ only by race or ethnicity, researchers can assess the degree to which racial considerations affects access to opportunities [Pager and Shepherd, 2008]. This approach offer a direct measurement of discrimination in real-world contexts and has proven to be effective in showing evidence of racial discrimination in the context of employment [Pager, 2007], housing searches [Yinger, 1997], applications for insurance [Wissoker et al., 1998], car sales [Ayres, 1995], home mortgages [Turner, 1999], hailing taxis [Ridley et al., 1989] and even the provision of health care [Schulman et al., 1999]. However, this method often suffers from internal validity due to experimenter effects, for example. In addition, some of the shortcomings of this approach are that it is very limited, expensive, difficult to implement and can only be used in very specific situations. For example, for measuring discrimination in the accessibility to Brazilian universities I cannot use the experimental approach, because the *vestibular* or the ENEM exam are the only two criteria for admission. Although, this model would not be appropriate for the Brazilian case, it could

be used in American universities where equally qualified students who differ only by race could apply for the same admission slot.

3.4 Racial Classification

Because the definition of race in Brazil is based on the color of the skin and not on biological factors, this study will merge blacks and browns (*negros, mulatos or morenos*) under the same category. Many other researchers have merged these two groups, since their statistical socioeconomic characteristics are very similar [Telles and Lim, 1998]. In addition, in Brazilian racial relations, a *mulato* is always identified with his black origins. Even a lighter skin *mulato*, who could pass as white, but has an African phenotype such as curly hair or a flat nose, can be said to have a 'foot in Africa' [Osório, 2008]. Regardless of the fact that many *mulatos* claim to be white, other people judging their appearance may not agree with that self-classification. Thus *mulatos* and blacks suffer from the same type of discrimination and can be classified as Afro-Brazilians because of their heritage. Therefore, since both groups suffer similar prejudice and are very homogeneous in socioeconomic characteristics it makes sense to analyze them together as $non - whites$ [Ribeiro, 2006].

The racial classification non-whites should, in theory, also include indigenous people and Asians (*yellow*). However, because these groups are so small in Brazil and because the Asian group tends to be privileged in its socio-economic characteristics, they will not be considered in this analysis.

3.5 Regional Differences

In order to better understand the effects of racism in Brazil, regional disparities need to be taken into consideration. Brazil is the fifth largest country in the world, with a vast territory that is very diversified both in terms of racial composition as well as with socioeconomic characteristics. Brazil has 27 states (including a federal district) but it is common to aggregate the states into five macro-regions. The Southern region of the country, where most of

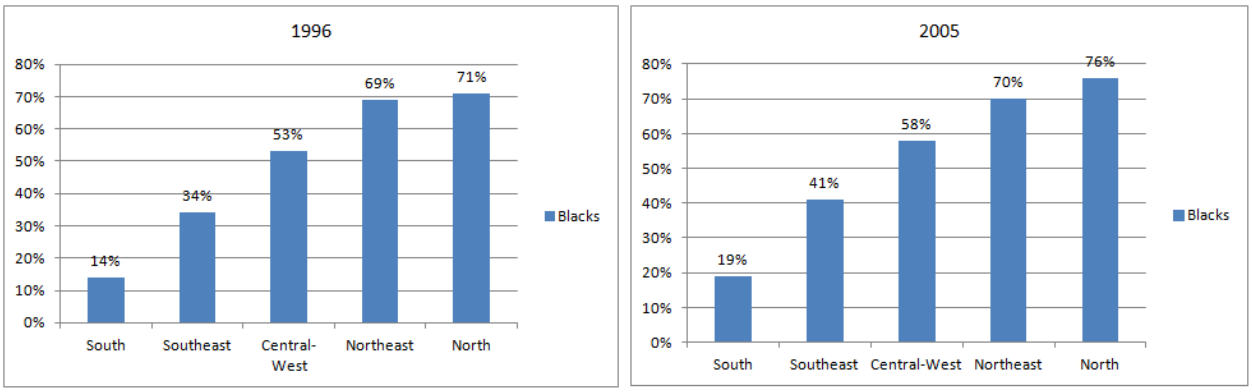

Figure 3.6. Distribution of Blacks by Regions - IBGE (National Household Survey, 1996-2005)

the European immigrants settled during the 19th and 20th centuries has a larger proportion of whites than the northern region as shown in Figure 3.6.

Besides racial composition, the regions differ in terms of income levels. According to a United Nations Development Program study by Osório [2008] in the period of 1996 to 2005, the poorest region of Brazil was the Northeast, followed by the North region, while the Central-West was the third poorest region, and the Southeast was the richest region in all years. Relevant to this study is the fact that whites in the Southeast and Central-West have an income level above the national average[2] while the income level of blacks in those regions is only just above half of the national average as shown in Figure 3.7. Most striking is the fact that the ratio between the income average of whites and blacks is close to two in all regions and for all years.

Due to these regional disparities, macro-regions will be controlled for through a *southeast* variable. In addition, I will control for rural and urban regions with an *urban* variable. The Brazilian states are listed in Appendix A and the macro-regions are shown on Appendix B.

[2]The national average income was set at 100 for both years.

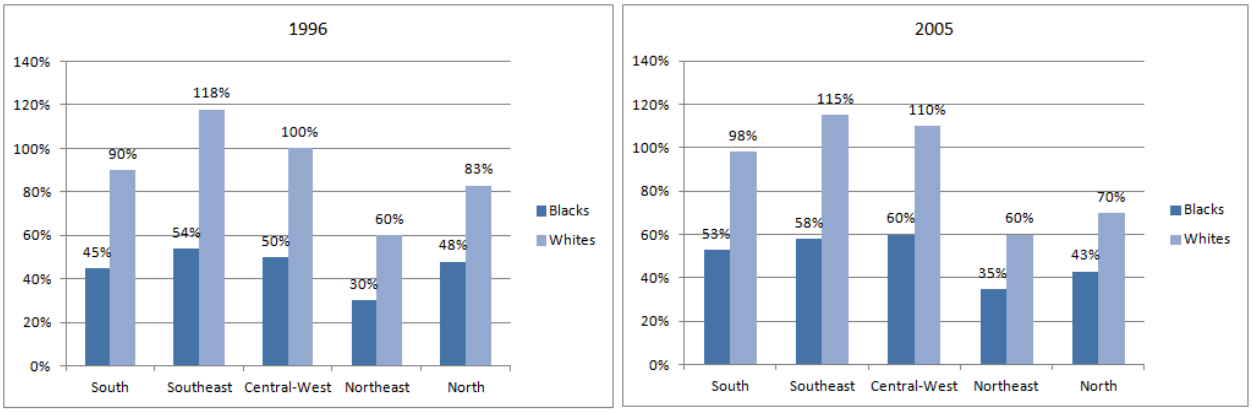

Figure 3.7. White/Black Income by Regions - IBGE (National Household Survey, 1996-2005)

3.6 Type of School and *Cursinho Pré-Vestibular*

As discussed in Chapter 2, there is a great racial disparity among students from public and private schools. The majority of students who attend public schools are non-whites and as a consequence of the lack of quality in public schools they perform below the average on the *vestibular* and are not admitted into public universities [Telles, 2004]. On average families of students in private school have higher income and the percentage of whites and blacks in private school is respectively 56.58 percent and 5.63 percent, with 32 percent being brown. In public school the percentage is 13.6 percent for black, 34 percent for white and 45 percent for brown [Guimarães and Sampaio, 2007]. Because there is clear evidence that the performance of students in public schools is much inferior to students in private schools [Guimarães and Sampaio, 2007] I control for type of school. In addition, wealthier students are able to afford preparatory courses that are specifically designed to prepare students to take the vestibular exam. These prep courses are called *curso pré-vestibular* or just *cursinho* and can be very expensive. Having access not only to private schools but also to a prep course gives students a better chance of going to a public university. Thus, I also control for attendance in prep courses.

3.7 Other Personal and Family Background Characteristics

Other explanatory variables include gender, age, parents educational levels and family income (both measures of socio-economic status), marital status, having children and working. When mother and father educations were listed as unknown, a dummy variable was created for the missing data. A $favela$ variable was created to identify students who live in *favelas* based on three criteria, students who lived in an urban area, and had no running water and no pavement on the street of their homes.

In Brazil, income is reported monthly and is set by monthly minimum wage. In 2012, one minimum wage was reported as R$622 *reais* which is roughly equivalent to $305 dollars as of July 11, 2012 [Tributário, 2012]. Thus, the variable *income* was divided into 8 categories by minimum wages in the ENEM Questionnaire: No income, less than one minimum wage, between one and 2 minimum wages, between 2 and 5 minimum wages, between 5 and 10 minimum wages, between 10 and 30 minimum wages, between 30 and 50 minimum wages and more than 50 minimum wages. Table 3.4 shows the values for one minimum wage for the past 8 years.

Although the data set covers 5 years it is not a panel study: the individual students vary each year. Increasingly, micro data sets in the form of a series of repeated cross-section sample surveys are available to social scientists and generally these data sets are grouped together for analysis.

Table 3.4. Values Equivalent to One Minimum Wage by date

Date	**Monthly R$**	**Daily R$**	**Hourly R$**
01/01/2012	622.00	20.73	2.83
03/01/2011	545.00	18.17	2.48
01/01/2011	540.00	18.00	2.45
01/01/2010	510.00	17.00	2.32
01/02/2009	465.00	15.50	2.11
03/01/2008	415.00	13.83	1.89
04/01/2007	380.00	12.67	1.73
04/01/2006	350.00	11.67	1.59
05/01/2005	300.00	10.00	1.36
05/01/2004	260.00	8.67	1.18

Source: Tributário [2012]

CHAPTER 4

EMPIRICAL ESTIMATION OF THE MODEL

> Racism is the key to understand and overcome increasing poverty and social inequalities in Brazil.
>
> –Mário Lisboa Teodoro, Director of the Research and Applied Studies Institute (IPEA)Teodoro [2007]

4.1 Data and Results for Regression Models

My main data source was the ENEM Socio-Economic Questionnaire answers for the years of 2004-2008. The model was run twice. Model 3.1 looked at the quality of education and how discrimination influences students' responses, while Model 3.2 examined how the student's ENEM score was affected by discrimination. Both models included identical variables on perceptions of discrimination, family, work and individual characteristics. The individual students were my unit of analysis and $n = 2,489,509$ students.

Since both dependent variables are ordinal, I first used ordered logit regression models to analyze the data. However, I also ran OLS estimates with the same specifications to compare the values of the coefficients.[1] This has been a common practice, especially in the 'Happiness' literature, where happiness is measured on a scale of 1 to 10 and is a categorical variable. As suggested by Dr.Okulicz-Kozaryn, authors seem to agree that both estimation methods yield similar results [Ferrer-i Carbonell and Frijters, 2004; Blanchflower and Oswald, 2011; Rodríguez-Pose and Maslauskaite, 2012].

[1]Because quality of education (*quality*) and ENEM score (*score*) are measured as categorical variables, ordered logit is the correct econometric approach. Comparing the results of ordered logit and OLS, we get almost identical results and coefficient values.

The results for the first model, looking at the quality of education, are shown in Table 4.1. Ordered Logit results can be interpreted as follows: positive coefficients increase the chance that the subject will be observed in a higher category, and negative coefficients increase the chance that the subject will be observed in a lower category. Note significance levels. Most coefficients are significant at the .001 level.

Table 4.1. OLS and Ologit Quality of Education

	Ordered Logit	**OLS**	**OLS Robust**
Victim	-0.180***	-0.198***	-0.198***
	(0.00339)	(0.00305)	(0.00329)
Witness	-0.0683***	-0.0365***	-0.0365***
	(0.00244)	(0.00220)	(0.00222)
Racist	-0.280***	-0.371***	-0.371***
	(0.00652)	(0.00575)	(0.00721)
Racist environment	-0.0912***	-0.0812***	-0.0812***
	(0.00315)	(0.00285)	(0.00289)
Non-white	-0.00757**	0.000290	0.000290
	(0.00259)	(0.00234)	(0.00235)
Female	0.137***	0.113***	0.113***
	(0.00234)	(0.00213)	(0.00213)
Age	-0.0276***	-0.0238***	-0.0238***
	(0.000706)	(0.000630)	(0.000678)
Income	-0.0678***	-0.0502***	-0.0502***
	(0.00125)	(0.00112)	(0.00117)
Public school	-0.880***	-0.711***	-0.711***
	(0.00427)	(0.00381)	(0.00374)
Prep course	0.0497***	-0.0108***	-0.0108***
	(0.00359)	(0.00321)	(0.00342)

Table 4.1. (continued)

	Ordered Logit	**OLS**	**OLS Robust**
Father education			
High school graduate	-0.137***	-0.117***	-0.117***
	(0.00332)	(0.00302)	(0.00300)
Some college	-0.183***	-0.157***	-0.157***
	(0.00724)	(0.00658)	(0.00654)
College graduate	-0.0580***	-0.0579***	-0.0579***
	(0.00584)	(0.00526)	(0.00526)
Unknown	-0.195***	-0.160***	-0.160***
	(0.00436)	(0.00392)	(0.00404)
Mother education			
High school graduate	-0.152***	-0.127***	-0.127***
	(0.00310)	(0.00282)	(0.00279)
Some college	-0.152***	-0.133***	-0.133***
	(0.00686)	(0.00625)	(0.00619)
College graduate	-0.0499***	-0.0464***	-0.0464***
	(0.00533)	(0.00482)	(0.00477)
Unknown	-0.139***	-0.131***	-0.131***
	(0.00742)	(0.00659)	(0.00720)
Married	0.0545***	0.0527***	0.0527***
	(0.00539)	(0.00478)	(0.00517)
Children	-0.0544***	-0.0722***	-0.0722***
	(0.00522)	(0.00462)	(0.00516)
Work	-0.175***	-0.147***	-0.147***
	(0.00249)	(0.00224)	(0.00224)
Southeast	-0.214***	-0.216***	-0.216***
	(0.00233)	(0.00211)	(0.00210)
Urban	-0.307***	-0.248***	-0.248***

Table 4.1. (continued)

	Ordered Logit	**OLS**	**OLS Robust**
	(0.00908)	(0.00820)	(0.00776)
Favela	0.155***	0.0804***	0.0804***
	(0.00683)	(0.00606)	(0.00644)
_cons		8.548***	8.548***
		(0.0102)	(0.00986)
N	2489509	2489509	2489509
R-sq		0.035	0.035

$*p < 0.05, **p < 0.01, ***p < 0.001$

The results for the second model, examining ENEM score are shown in Table 4.2.

Table 4.2. OLS and Ologit ENEM Score

	Ordered Logit	**OLS**	**OLS Robust**
Victim	-0.0617***	-0.00944***	-0.00944***
	(0.00512)	(0.000777)	(0.000759)
Witness	0.342***	0.0507***	0.0507***
	(0.00369)	(0.000563)	(0.000561)
Racist	-0.200***	-0.0277***	-0.0277***
	(0.00953)	(0.00147)	(0.00155)
Racist environment	0.116***	0.0189***	0.0189***
	(0.00470)	(0.000728)	(0.000742)
Non-white	-0.282***	-0.0417***	-0.0417***
	(0.00391)	(0.000597)	(0.000594)
Female	-0.529***	-0.0815***	-0.0815***

Table 4.2. (continued)

	Ordered Logit	**OLS**	**OLS Robust**
	(0.00354)	(0.000542)	(0.000559)
Age	-0.157***	-0.0208***	-0.0208***
	(0.00110)	(0.000161)	(0.000154)
Income	0.315***	0.0506***	0.0506***
	(0.00183)	(0.000285)	(0.000308)
Public school	-1.228***	-0.262***	-0.262***
	(0.00549)	(0.000971)	(0.00124)
Prep course	0.384***	0.0646***	0.0646***
	(0.00508)	(0.000818)	(0.000929)
Father education			
High school graduate	0.240***	0.0335***	0.0335***
	(0.00486)	(0.000791)	(0.000816)
Some college	0.540***	0.103***	0.103***
	(0.00951)	(0.00168)	(0.00208)
College graduate	0.540***	0.121***	0.121***
	(0.00753)	(0.00134)	(0.00172)
Unknown	0.0494***	0.00808***	0.00808***
	(0.00675)	(0.00100)	(0.000916)
Mother education			
High school graduate	0.220***	0.0292***	0.0292***
	(0.00460)	(0.000721)	(0.000750)
Some college	0.425***	0.0733***	0.0733***
	(0.00927)	(0.00159)	(0.00190)
College graduate	0.459***	0.0947***	0.0947***
	(0.00704)	(0.00123)	(0.00153)
Unknown	-0.300***	-0.0413***	-0.0413***
	(0.0113)	(0.00168)	(0.00154)

Table 4.2. (continued)

	Ordered Logit	**OLS**	**OLS Robust**
Married	0.206***	0.0287***	0.0287***
	(0.00825)	(0.00122)	(0.00108)
Children	0.209***	0.0308***	0.0308***
	(0.00789)	(0.00118)	(0.00109)
Work	0.146***	0.0183***	0.0183***
	(0.00371)	(0.000573)	(0.000576)
Southeast	0.170***	0.0250***	0.0250***
	(0.00350)	(0.000537)	(0.000538)
Urban	0.108***	0.0143***	0.0143***
	(0.0140)	(0.00209)	(0.00200)
Favela	-0.288***	-0.0327***	-0.0327***
	(0.0103)	(0.00155)	(0.00142)
_cons		2.262***	2.262***
		(0.00264)	(0.00268)
N	2489509	2489509	2489509
R-sq		0.212	0.212

$*p < 0.05, **p < 0.01, ***p < 0.001$

For both models, I included time dummies (*year*) in the equation, that is time fixed effects. Such a specification simply tests whether there are unaccounted for contextual effects due to year differences. Also the multicollinearity test collin was run for the models and all variables had very low vif coefficients well below the threshold that would indicate multicollinearity (see Appendix D.1).

Although ologit results are interpreted in a similar way to OLS with respect to its sign and significance, it is much easier to interpret ordered logit by the percentage change in

odds ratios. See Table 4.4 for the first model results and Table 4.5 for the second model results. In Table 4.4, column '% Percentage Change in Odds Ratio' gives for a unit increase of each covariate of the response variable, the percentage of change in odds. Thus, the odds of having a higher score for quality of education are 16.5 percent less for victims of discrimination, holding all other variables constant. Column '%StdX' gives the percent change in odds ratio for a standard deviation increase in a covariate and 'SDofX' gives the standard deviation of X.

4.2 The Effects of Discrimination on Quality of Education

Based on these results, interesting patterns were established. Students who experienced victimization ranked the quality of education in their high school in much lower categories than students who were not discriminated against. In fact, the odds of having a higher quality of school experience is 16.5 percent less for victims of discrimination, holding all other variables constant.

The ENEM Socio-Economic Questionnaire failed to ask whether or not students were constantly being discriminated against, which would indicate if it was an isolated event or a constant occurrence that could be classified as bullying. According to Leão and Carvalho (2011), race is directly linked to frequent cases of bullying in Brazilian schools. Other individual characteristics that heighten risks of being victimized besides race include: weight (obese or too thin), height (short or too tall), hygiene (smell), sexual orientation, handicap, physical appearance, and socio economic status [Leão and Carvalho, December 2011].

This result could be linked to student's perception of an unsafe school environment that becomes an undesirable place because of its hostility. Some studies have demonstrated that children who are bullied are more likely to avoid school, drop out and lose concentration and enthusiasm for school [Kochenderfer and Ladd, 1996; Olweus, 1992; Fried and Fried, 1996; CEATS, 2010].

One interesting finding is that said racist students have an even lower odds. For this group of students the odds of having a higher quality of school experience is 24.4 percent less, holding all other variables constant. This is a relevant finding that indicates that perpetrators of discrimination, possible bullies, also have their quality of education affected negatively.

As parents' level of education rises, students become less critical of the quality of their education. A student whose father highest level of education was high school, was 12.8 percent less likely to give a higher score for quality of education compared to 5.6 percent less likely for a student whose father highest level education was college graduate. This same pattern can be observed for mother education (see Table 4.4). Perhaps, this is due to the fact that parents level of education is directly related to income and students whose parents have high levels of education are more likely to go to a private school which have a better quality of education than public school.

Another interesting factor is that the odds of a student from the public sector having a higher quality of school experience is 58.5 percent less, holding all other variables constant. This reflects the poor quality of education in the public sector throughout the country. Student workers had a worse high school experience than students who did not work, and female and older students had a better high school experience than males and younger students. Students who live in *favelas* had a much better experience in high school than other students, perhaps because their perception of quality of education has a much lower threshold compared to other students. This is also true for rural areas, where the odds of giving a higher score for quality of education are 26.4 percent less for students from urban areas.

Race appears to be significant in the ordinal logit solution but loses significant when doing OLS and OLS robust estimation. The reason is that the way white and non-white students

ranked quality of education was actually very similar, as indicated by the percentages in the table 4.3 below:

Table 4.3. Quality of Education by Race

Race	Rank											
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
white	6,345	8,194	7,901	14,955	35,218	147,041	162,514	346,137	433,788	164,769	53,841	1,380,703
	0.46	0.59	0.57	1.08	2.55	10.65	11.77	25.07	31.42	11.93	3.90	100.00
non-white	5,654	8,307	6,177	10,416	25,354	120,404	129,180	271,387	347,383	137,396	47,148	1,108,806
	0.51	0.75	0.56	0.94	2.29	10.86	11.65	24.48	31.33	12.39	4.25	100.00
Total	11,999	16,501	14,078	25,371	60,572	267,445	291,694	617,524	781,171	302,165	100,989	2,489,509
	0.48	0.66	0.57	1.02	2.43	10.74	11.72	24.81	31.38	12.14	4.06	100.00

4.3 The Effects of Discrimination on ENEM Performance

Looking at the second percent change in odds model presented in Table 4.5, one finds the odds of having a higher score on the ENEM is lowered by 6 percent for students who were victims of racial discrimination. Although this result is small, it is statistically significant at $p < 0.001$. Students who admitted to being racist, and could possibly be the perpetrators of racism, have an even lower odds of scoring higher in the ENEM examination. The odds of a said racist student is 18.1 percent less, holding all other variables constant.

Other variables had a greater impact on students performance at the ENEM exam. Non-white students are 24.6 percent less likely to score in a higher category of the ENEM exam compared to white students. Also the odds of having a higher score on the ENEM exam is 70.7 percent less for students of public schools, holding everything else constant. Female students and older students were 41.1 percent and 14.5 percent less likely to score higher on the ENEM than male students and younger students. On the other hand, an increase in the income category improved the odds of scoring higher on the ENEM exam by 37 percent.

Also, for both father's and mother's education, there is a clear increase that is statistically significant: the more educated the student's parents are the more likely the student is to score higher in the ENEM. Students' whose father's highest level of education is high school

were 27.1 percent more likely to score in a higher category. However, having a father with a college degree increases the odds by 71.5 percent.

Students who did not know their mother's education, which could possibly indicate that they were not raised by their mothers, were actually 26 percent less likely of scoring higher on the ENEM, while students whose mothers had a college degree were 58.3 percent more likely to score in a higher category.

Not surprisingly, although students who live in *favelas* were more likely to give a high score for their quality of education in the previous model, they were 25 percent less likely to score higher on the ENEM than students not living in the *favelas*. Students from the Southeast region were also more likely to score 18.5 higher on the ENEM than from other regions in Brazil. This reflects the fact that the quality of education in this region is superior to other regions of the country.

An interesting finding is that being married, having children and working actually have a positive effect on how a student performs in the ENEM exam. Perhaps the responsibilities that these roles entail is what is at play here. Being married, having children and working increases the odds of having a higher ENEM score by 22.8 percent, 23.2 percent and 15.7 percent respectively.

4.3.1 Limitations

The analysis do have limitations. The dataset is based on questionnaire answers, and it is very likely that there will be reporting biases. Questionnaires cannot measure discrimination directly, since they capture self-reported evidence and experiences of discrimination that are not validated [Blank, 2004]. Discrimination that is subtle or indirect, for instance, may not be readily detected by the victims. In addition, students may also use different meanings for discrimination than reported accounts, resulting in the under-reporting of discrimination and a discrepancy between witnessing and reporting discrimination. Some studies in psychology

have suggested that because discrimination appears to adversely impact self-esteem and perceptions of control, minority group members, especially those of low status, are likely to minimize and deny experiences of discrimination [Williams et al., 2001; Ruggiero and Taylor, 1997; Ruggiero and Major, 1998; Crosby, 1984].

Another limitation is that the model was filtered to include only students who fully answered the Socio-Economic Questionnaire, and as a result excluded those who did not complete it. These students are inherently different than the students who answered the whole questionnaire: in survey research refusal or inability to respond all of the questionnaire's question may be correlated with such things as education, income, and geographic location.

Also, although the sample size is very large, some states, such as Acre and Roraima, accounted for only .26 percent of the dataset whereas, the state of São Paulo alone accounted for 30.21 percent of the dataset. Thus, I created the dummy variable *southeast* to control for regional differences, since the state of São Paulo, Minas Gerais, Espírito Santos and Rio de Janeiro account for 50.81 percent of the students in this sample. The remaining 49.19 percent of the dataset is distributed among the other states as shown in Appendix C.1. Nevertheless, I re-ran the models several times randomly picking smaller percentages such as 25 and 10 percent of my dataset and the results were similar in magnitude, direction and significance to the models using the whole set of data.

Table 4.4. Ordered Logit: Percentage Change in Odds (Model 1 - Quality)

Quality	b	z	$P > \|z\|$	%	$\%Stdx$	SDofx
Victim	-0.18034	-53.159	0.000	-16.5	-6.2	0.3522
Witness	-0.06835	-27.976	0.000	-6.6	-3.2	0.4833
Racist	-0.28017	-42.980	0.000	-24.4	-4.9	0.1793
Racist environment	-0.09123	-28.997	0.000	-8.7	-3.3	0.3729
Non-white	-0.00757	-2.928	0.003	-0.8	-0.4	0.4970
Female	0.13722	58.523	0.000	14.7	7.0	0.4923
Age	-0.02764	-39.133	0.000	-2.7	-6.0	2.2417
Income	-0.06779	-54.293	0.000	-6.6	-7.2	1.1049
Public school	-0.87960	-205.936	0.000	-58.5	-23.8	0.3090
Prep course	0.04973	13.837	0.000	5.1	1.6	0.3229
Father Education						
High school graduate	-0.13728	-41.391	0.000	-12.8	-5.0	0.3699
Some college	-0.18269	-25.224	0.000	-16.7	-2.9	0.1620
College graduate	-0.05802	-9.940	0.000	-5.6	-1.3	0.2186
Unknown	-0.19520	-44.819	0.000	-17.7	-5.4	0.2838
Mother Education						
High school graduate	-0.15221	-49.113	0.000	-14.1	-5.8	0.3951
Some college	-0.15214	-22.163	0.000	-14.1	-2.6	0.1701
College graduate	-0.04994	-9.371	0.000	-4.9	-1.2	0.2383
Unknown	-0.13947	-18.792	0.000	-13.0	-2.3	0.1671
Married	0.05447	10.114	0.000	5.6	1.5	0.2798
Children	-0.05440	-10.424	0.000	-5.3	-1.7	0.3171
Work	-0.17508	-70.200	0.000	-16.1	-7.9	0.4676
Southeast	-0.21355	-91.723	0.000	-19.2	-10.1	0.4999
Urban	-0.30668	-33.790	0.000	-26.4	-3.8	0.1251
Favela	0.15535	22.752	0.000	16.8	2.7	0.1715

N=2489509

b = raw coefficient

z = z-score fore test of b=0

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

% StdX = percentage change in odds for SD increase in X

SDofX = standard deviation of X

Table 4.5. Ordered Logit: Percentage Change in Odds (Model 2 - Score)

Score	b	z	$P > \|z\|$	%	$\%Stdx$	SDofx
Victim	-0.06174	-12.048	0.000	-6.0	-2.2	0.3522
Witness	0.34218	92.728	0.000	40.8	18.0	0.4833
Racist	-0.20000	-20.983	0.000	-18.1	-3.5	0.1793
Racist environment	0.11582	24.662	0.000	12.3	4.4	0.3729
Non-white	-0.28201	-72.197	0.000	-24.6	-13.1	0.4970
Female	-0.52893	-149.291	0.000	-41.1	-22.9	0.4923
Age	-0.15664	-142.936	0.000	-14.5	-29.6	2.2417
Income	0.31502	172.548	0.000	37.0	41.6	1.1049
Public school	-1.22833	-223.594	0.000	-70.7	-31.6	0.3090
Prep course	0.38441	75.640	0.000	46.9	13.2	0.3229
Father education						
High school graduate	0.24019	49.424	0.000	27.1	9.3	0.3699
Some college	0.53997	56.758	0.000	71.6	9.1	0.1620
College graduate	0.53951	71.686	0.000	71.5	12.5	0.2186
Unknown	0.04942	7.326	0.000	5.1	1.4	0.2838
Mother education						
High school graduate	0.21975	47.756	0.000	24.6	9.1	0.3951
Some college	0.42480	45.842	0.000	52.9	7.5	0.1701
College graduate	0.45905	65.219	0.000	58.3	11.6	0.2383
Unknown	-0.30049	-26.638	0.000	-26.0	-4.9	0.1671
Married	0.20561	24.908	0.000	22.8	5.9	0.2798
Children	0.20853	26.418	0.000	23.2	6.8	0.3171
Work	0.14572	39.322	0.000	15.7	7.1	0.4676
Southeast	0.16954	48.457	0.000	18.5	8.8	0.4999
Urban	0.10805	7.702	0.000	11.4	1.4	0.1251
Favela	-0.28790	-27.950	0.000	-25.0	-4.8	0.1715

N=2489509

b = raw coefficient

z = z-score fore test of b=0

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

% StdX = percentage change in odds for SD increase in X

SDofX = standard deviation of X

CHAPTER 5

THE UNIVERSITY OF SÃO PAULO COMPARISON

> If blacks do not reach the university, obviously they do not share the equality of conditions and opportunities given to whites. [Only] if the quantity of whites and blacks were balanced we could say that color is not a relevant factor.
>
> –Rosa Weber, Justice of the Brazilian Supreme Court [Weber, 2012]

5.1 Impediment to Social Mobility

Many researchers claim that the performance of public high school students in national exams are worse than the performance of students from private schools [Telles, 2004; Guimarães and Sampaio, 2009; Castro and Guimarães, 1993]. The argument follows that the majority of students who attend public schools are non-whites and as a consequence of the lack of quality in public schools they perform below average on the *vestibular* and are not admitted into public universities. A study by Tomelin [2002] analyzed the opportunities for higher education in Brazil from colonial period to 2000 and found that there is a long-lasting reduction of access to higher education for segments of the Brazilian society on the basis of race and social class. Other researchers have argued that education is one of the foundations to economic and social development of a society because it unquestionably results in the growth of the individual's economic and social status in the society, and the economic growth of the country as a whole.

This is the reason why it is important to understand whether or not the *vestibular* is a fair tool used by the universities, or if it is an impediment to social mobility in Brazil. By analyzing the socioeconomic characteristics of students admitted to public universities in

Brazil one is able to form a better opinion on the matter and perhaps help lawmakers create policies that will promote equity in higher education.

Two research question need to be answered:

1. Whether or not there is no relationship between type of high school attended and vestibular acceptance.

2. Whether or not there is no relationship between race and vestibular acceptance.

In order to test these hypotheses, I chose the University of São Paulo (USP), the largest Brazilian university as well as one of the country's most prestigious universities. The USP *vestibular* is prepared and administered by a federal agency called FUVEST (University Foundation for *Vestibular*) that also gives a Socio-Economic Questionnaire to all applicants of the *vestibular*. I contacted FUVEST officials requesting access to a dataset that would have included the socio-economic status of all applicants to the *vestibular* as well as a variable indicating whether or not the student had passed the exam, but my request was denied. The only data available to the public are the summary statistics for each major which allows for chi-square tests only. After a compromise, I was able to acquire the mean ENEM score with the standard deviation (for the objective part of the exam) for every student admitted at USP during the years of 2004-2008 by major. Since I have the dataset with the characteristics for all students who took the ENEM exam during 2004-2008, I was able to make inferences based on the ENEM dataset.

The limitation is obvious: although I have the dataset of students who took the ENEM score with national probabilities, there is no way of telling whether or not the student actually applied to the *vestibular* at USP. However, I am able to observe the characteristics of students who have the same score on the ENEM exam as those who were accepted at the University of São Paulo (USP).

5.2 The *Vestibular*

Before stating what I found about the students admitted to USP, it is important to explain in more detail what the *vestibular* exam is and how it is used in the admission process of universities.

University access in Brazil is a very competitive process. Public universities are not only free but are also the most prestigious universities in the country. It is estimated by the Ministry of Education and Culture that in 2006 a total of 5,181,699 students struggled to get access to one of the 2,629,598 available places in Brazilian universities [INEP, 2008]. For some majors, such as Medicine, Engineering and Law, the ratio of students to available places can be as high as 20 or more in public universities [Carvalho and Magnac, 2010]. Different than other countries like the United States that uses multiple criteria for admission, Brazil uses an objective-grading exam called the *vestibular*.

The *vestibular* has the following general features. First, students must choose a single undergraduate major before taking the test and compete against those students who made the same choice [Carvalho and Magnac, 2010]. Second, the exam comprises of many sub-exams, each one evaluating knowledge in a specific subject, i.e. Mathematics, Physics, Chemistry, Biology, Portuguese, History, Geography and a Foreign Language [Carvalho and Magnac, 2010]. In general, the *vestibular* consists of two stages. The first stage is common to all majors and the second stage is more specific to each major. The different departments within the university that are providing the undergraduate major courses can weight the sub-exams differently in order to reflect their priorities. All candidates must pay a fee that differs in amount depending on the university before taking the *vestibular*. Some universities exempt this fee for students based on their financial needs. The University of São Paulo saw a great increase in the number of students from public schools taking the *vestibular*

after 2005 because it decided to increase the number of exemptions given to students with financial need from 20,000 to 65,000 [FUVEST, 2010].

Once the students take the *vestibular* exam, the different departments rank all their applicants by grade and reject those exceeding the number of seats for each major [Carvalho and Magnac, 2010]. Generally, students can have up to three choices of major and if they are not accepted into their first choice they can be considered for the other two if their *vestibular* grade makes the cut for those majors. The *vestibular* is a very fierce competition in Brazil that is not equally fair to all students. As my results will show in the next section, students from public universities are not as well prepared to take the exam as students from private schools. As a result the *vestibular* has been argued to be a social mobility impediment in Brazilian society. Cavalcanti et al. [2010] quantified the difference in performance of public and private school students in the *vestibular* of a major public university in Pernambuco, Brazil. They found that the elitist Brazilian higher education system is an important channel for inequality persistence, and that going to a private school versus a public school matters when taking the *vestibular*.

5.3 The Dataset

In order to analyze the characteristics of students who could have passed the *vestibular* exam at the University of São Paulo I used three datasets:

1. The ENEM Socio-Economic Questionnaire for the years of 2004-2008 provided by the National Institute of Educational Research (INEP).[1]

2. The FUVEST Socio-Economic Questionnaire dataset available online.[2]

[1]This is the same dataset used in the previous chapters.

[2]The FUVEST Socio-Economic Questionnaire for every year can be found at the FUVEST website at: http://www.fuvest.br/vest2008/estat/estat.stm

Every student who applies to the *vestibular* in the University of São Paulo answers a socio-economic questionnaire. Since this data is bivariate, I use this dataset to conduct chi square tests of independence to determine if there is an association between passing the *vestibular* and the type of school that a student study at, divided into three options: private high school, public high school and others (which includes: study abroad, GED equivalent, mostly in private, mostly in public, half in private and half in public). The public high schools include municipal, state and federal public high schools. The type of high school was chosen as a variable here because it indicates the socio-economic status of the students. Although data was available for each specific major, the data analyzed for the chi-square tests comprises of the average percentage for all majors together.

3. The ENEM score and standard deviation of students accepted at USP provided by FUVEST.

   After contacting FUVEST I was able to acquire the ENEM score for each major at USP for the years 2004-2008. This ENEM score is only for the objective part of the exam and the maximum score is 63. For the year of 2004, 2005, 2006, 2007 and 2008 there were a total of 86, 98, 101, 105 and 107 majors respectively at USP. Instead of looking at every since major, I decided to analyze the major with the highest ENEM score, the major with the lowest ENEM score and the total average score for all majors for each year. I used this dataset to create three dummy variables in my main dataset (the ENEM dataset) to indicate whether or not looking at the ENEM score alone, a student would be able to pass with the lowest ENEM score achieved by the students who passed the *vestibular* in these three categories.

5.3.1 Chi-Square tests for Type of School

The first step in examining the data was to simply use the FUVEST dataset to run chi-square tests and see whether or not type of school was associated with acceptance at USP. For every year analyzed (2004-2008) the chi-square test results indicate that the type of high school attended has some bearing on passing the USP *vestibular*, being significant at the 0.01 level. See Tables 5.1 to 5.5.

Starting in 2005, one can see an increase in the number of students from public schools applying to USP due to an increase in the number of exemption fees awarded to students with financial need in 2005. This is evident by the increase in the percentage of students not approved coming from public schools. Although there was an increase in the number of students who applied from public schools the approval rate remained close to 20 percent.

Table 5.1. *Vestibular* Acceptance vs. Type of High School in 2004

Category	**Private**	**Public**	**Other**	**Total**
Approved	72.8%	21.5%	5.7%	10,051
Not approved	55.0%	37.0%	8.0%	145,830
$df = 2$ $\alpha = 0.01$ $\chi^2 = 1230.718$ $p - value = 0$ *reject null*				

Table 5.2. *Vestibular* Acceptance vs. Type of High School in 2005

Category	**Private**	**Public**	**Other**	**Total**
Approved	71.9%	23.0%	5.1%	11,025
Not approved	51.6%	41.1%	7.2%	142,431
$df = 2$ $\alpha = 0.01$ $\chi^2 = 1707.192$ $p - value = 0$ *reject null*				

Table 5.3. *Vestibular* Acceptance vs. Type of High School in 2006

Category	**Private**	**Public**	**Other**	**Total**
Approved	73.2%	21.2%	5.6%	11,315
Not approved	48.8%	44.5%	6.7%	157,739
$df = 2$ $\alpha = 0.01$ $\chi^2 = 2590.688$ $p - value = 0$ *reject null*				

Table 5.4. *Vestibular* Acceptance vs. Type of High School in 2007

Category	**Private**	**Public**	**Other**	**Total**
Approved	71.6%	23.8%	4.6%	11,397
Not approved	56.8%	37.0%	6.2%	130,169
$df = 2$ $\alpha = 0.01$ $\chi^2 = 955.695$ $p - value = 0$ *reject null*				

Table 5.5. *Vestibular* Acceptance vs. Type of High School in 2008

Category	**Private**	**Public**	**Other**	**Total**
Approved	70.9%	23.6%	5.5%	11,242
Not approved	59.9%	33.9%	6.2%	128,650
$df = 2$ $\alpha = 0.01$ $\chi^2 = 550.063$ $p - value = 0$ *reject null*				

5.3.2 ENEM Score Comparison

Since the chi-square test can only indicate the similarity or difference of two variables, but cannot demonstrate whether there is a causal link between these two variables a more appropriate statistical method is required. Thus, I used the ENEM dataset and the dataset provided by FUVEST to make inferences about the characteristics of students. Using the ENEM dataset I filtered the data and kept only students who answered all questions relevant to my study. The FUVEST dataset was used to indicate the ENEM score of students who passed the USP *vestibular* by major and by year. Thus, I merged the two datasets and created dummy variables to indicate if a student's ENEM score would allow them to be accepted into USP by comparing it to the lowest score achieved by an accepted student. I then separated the dataset by year and examined each year individually. Also, I created race dummy variables, *black*, *brown*, *indio* and *asian* to analyze each different race's effects, using *white* as my reference race in my statistical analysis.

Tables 5.6, 5.7, 5.8, 5.9, and 5.10 indicate some of the most competitive majors, the average ENEM score of all majors, and the major with the lowest ENEM score with its respectively standard deviation. Again, the maximum ENEM score that a student could make, for all of these years, was 63. The highest ENEM score was achieved in the most

Table 5.6. ENEM Scores for Students Accepted at USP - 2008

Major	**Mean**	**S.D.**
Medicine	60.05	1.95
Engineering (Poli)	58.40	2.60
Law	58.97	2.27
Social Science	55.93	3.32
Natural Sciences	45.83	7.14
All Majors Average*	55.27	4.79

* There were 107 majors in 2008.

Table 5.7. ENEM Scores for Students Accepted at USP - 2007

Major	**Mean**	**S.D.**
Medicine	56.63	2.26
Engineering (Poli)	53.88	3.24
Law	54.00	3.13
Social Science	50.05	4.79
Natural Sciences	33.87	7.04
All Majors Average*	48.80	6.20

* There were 105 majors in 2007.

Table 5.8. ENEM Scores for Students Accepted at USP - 2006

Major	**Mean**	**S.D.**
Medicine	58.51	2.07
Engineering (Poli)	56.00	2.89
Law	56.20	3.05
Social Science	53.34	3.82
Natural Sciences	40.45	5.61
All Majors Average*	51.74	5.40

* There were 101 majors in 2006.

competitive major, Medicine. The lowest ENEM score for 2008, 2007 and 2006 was found in the *Ciências da Natureza* (Natural Sciences) major. The Natural Sciences major offers an integrated degree in Mathematics, Natural Sciences and Education and is designed to prepare science teachers for the elementary and primary education levels in private and public

Table 5.9. ENEM Scores for Students Accepted at USP - 2005

Major	**Mean**	**S.D.**
Medicine	59.65	1.92
Engineering (Poli)	57.88	2.71
Law	58.24	2.56
Social Science	55.33	3.42
Audiology (Santa Casa)	32.07	7.78
All Majors Average*	54.12	5.46

* There were 98 majors in 2005.

Table 5.10. ENEM Scores for Students Accepted at USP - 2004

Major	**Mean**	**S.D.**
Medicine	59.01	2.12
Engineering (Poli)	57.11	3.12
Law	57.59	2.92
Social Science	54.63	4.62
Audiology (Bauru)	48.23	7.30
All Majors Average*	54.34	4.75

* There were 86 majors in 2004.

schools, but graduates are also qualified to teach at the secondary education level in Biology, Physics and Chemistry or to work in museums, centers of science, parks, NGOs, projects of environmental education, scientific disclosure and in the output of educational material. In 2005 the lowest ENEM score was in *Fonoaudiologia* major at Santa Casa campus. The *Fonoaudiologia* (Audiology) major is equivalent to the degree that prepares speech pathology professionals in the United States. They specialize in communication disorders as well as swallowing disorders. In 2004, the Audiology major at the Bauru campus was again the major with the lowest ENEM score.

Table 5.11 provides a summary and a description of variables used in this analysis.

Table 5.11. Student-level variables

Variable	**Definition and Source**
	Instituto Nacional de Estudos e Pequisas and FUVEST
Race	
White	1(yes); 0(no)
Black	1(yes); 0(no)
Brown	1(yes); 0(no)
Asian	1(yes); 0(no)
Indigenous	1(yes); 0(no)
Female	1(female); 0(male)
Age	Student's age
Family Income	All wages by monthly minimum wage: 0(low) to 7(high)
Public School	Type of high school attended: 1(public); 0(private)
Prep Course	Attended *cursinho* for the *vestibular*? 1(yes); 0(no)
Mother education	
High School Graduate	1(yes); 0(otherwise)
Some College	1(yes); 0(otherwise)
College Graduate	1(yes); 0(otherwise)
Unknown	1(yes); 0(otherwise)
Victim	Have you ever suffered racial or ethnic discrimination?
	1(yes); 0(no)
Racist	Do you consider yourself racist? 1(yes); 0(no)
Escore	ENEM score: min 0, max 63
Dummies for ENEM scores	
$pavg$	Total ENEM average of students accepted at USP
$pmed$	Accepted in Medical School at USP
$pnsci$	Accepted in Natural Sciences at USP
$pfonosc$	Accepted into Audiology Santa Casa at USP
$pfonob$	Accepted into Audiology Bauru at USP

5.3.3 Data Analysis

As seen in Tables 5.6, 5.7, 5.8, 5.9, and 5.10, the ENEM score of students accepted at USP changed each year. For this reason, the dataset had to be analyzed year by year. Also, an important law of geography states that, "everything is related to everything else, but near things are more related than distant things" [Tobler, 1970]. Thus, since most students who apply to the University of São Paulo are from the state of São Paulo, I divided my dataset into a sub-sample that included only students from that state. Although, I might lose statistical significance due to a reduction in number of students, it is well known in the literature that the quality of education both in public and private high schools in São Paulo is superior than in other states along with other variables such as standard of living, and income. Hence, it makes sense to consider in this analysis just students from the state of São Paulo.

I present the results in reserve order so that the most recent years' are shown first, starting in 2008 and going back to 2004.

2008. The lowest ENEM score of a student accepted at USP in 2008 was in the Natural Sciences major. Thus, every student who made an ENEM score ≥ 38.69 was assigned a dummy variable *pnsci* to indicate that s/he would have exceeded the ENEM threshold for acceptance in this particular major and this variable became a proxy for acceptance at USP in Natural Sciences. Since this was the major with the lowest ENEM score, it is obvious that students in this group would not have passed in Medicine where the lowest ENEM score was ≥ 58.1. Hence a dummy variable *pmed* was created for students who scored the same or exceeded the threshold for Medicine. These thresholds are indicate in Figure 5.1 along with the racial distribution of students by ENEM score.

The first step in examining the data is simply to get an idea of how many students would have passed the *vestibular* from the original sample. Considering the major with the lowest

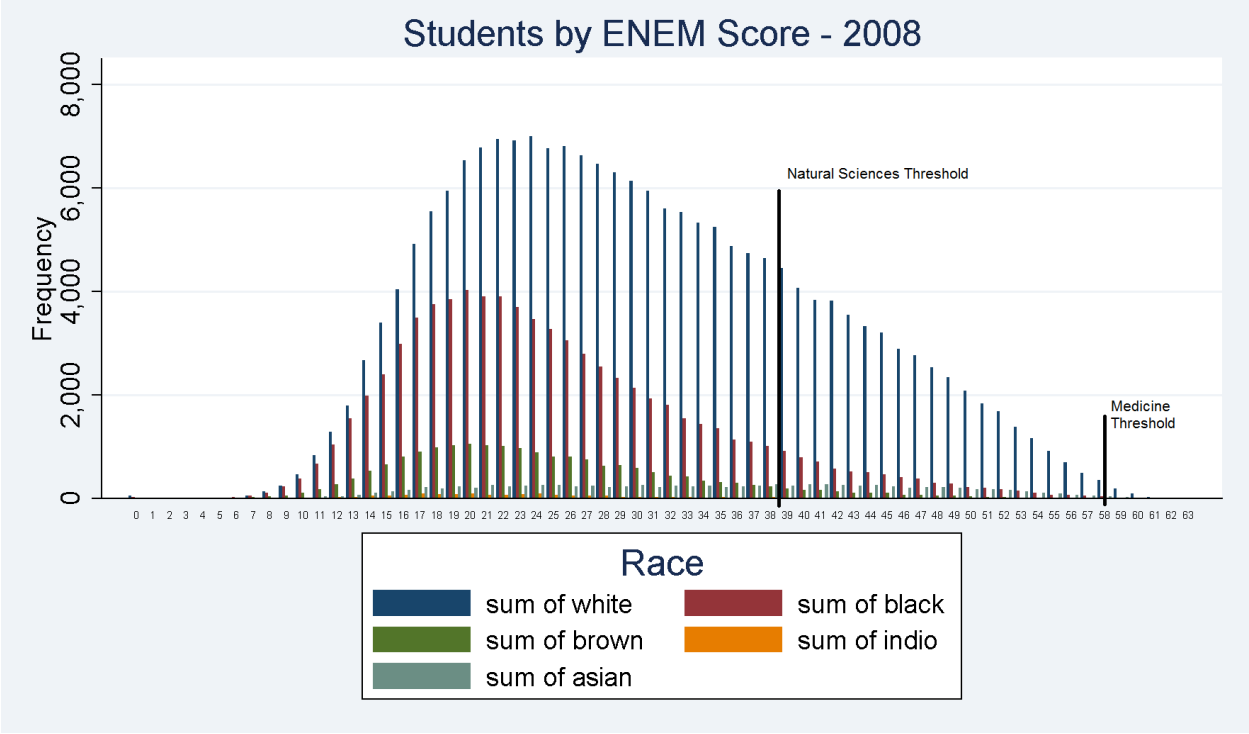

Figure 5.1. ENEM Score Distribution by Race

ENEM score, out of 991,810 students nationwide, 14.94% (148,170) would have scored $\geq$ 38.69. Looking at the average score of all students accepted at USP, a student would have had to score $\geq$ 50.48 on average to be accepted in 2008. Out of the 991,810 students nationwide only 2.35% (23,330) would meet this criterion. A more disturbing image emerges when looking at the most competitive major, Medicine. Nationwide in 2008 only 0.08% (807) would have exceeded the threshold for Medicine acceptance at USP. Furthermore, when looking at race only 14.62% (118) of students who met the ENEM score required for Medicine were black, 1.12% (9) were brown, and 0.12% (1) was indigenous. The majority race of students meeting the required ENEM score for Medicine were whites 76.70% (619) and Asians 7.43% (60).

Now, looking at the sub-sample that examined only the state of São Paulo, out of 300,870 students, 19.91% (59,909) would have score $\geq$ 38.69, the minimum score to be accepted in

Natural Sciences. The average ENEM score of all students admitted at USP was ≥ 50.48 in 2008. Only 3.58% (10,760) would have met this threshold in the state of São Paulo. For the most competitive major, Medicine, only .13% (403) students would have met the criterion to be accepted. Note that all percentages in the state of São Paulo are higher than the same estimates nationwide.

Using the ENEM score dummy variables equivalent to the lowest ENEM score achieved by an accepted student at USP (*pnsci*), the average ENEM score of all students (*pavg*) and the lowest ENEM score of the most competitive major (*pmed*), I ran logistic regressions to see the significance of student's characteristics on these variables. Logit regression estimates results are shown in Appendix D.12 for students with the characteristics described in Table 5.11, indicating what characteristics have the most influence for passing the *vestibular* exam at USP at the highest, average and lowest criteria. Again, because it is easier to interpret logit results by looking at the odds percentages, I provide these results in Tables 5.12, 5.15 and 5.16.

The results for the year 2008 indicate that the odds of being accepted into the average (*pavg*) ENEM category at USP, are 35 percent smaller for black students, 66.3 percent smaller for brown students and 58.3 percent smaller for indigenous students. Asian students on the other hand, have an odds of 44.8 percent larger, holding all other variables constant. The odds of being accepted into the *pavg* category, are 81 percent smaller for students from public school and going to a *vestibular* prep course raises the odds to 125.5 percent. Furthermore, the higher the level of education of a student's mother, the higher the odds of passing into this category. Income also plays an important role, an increase in the income category increases the odds of passing to 54.8 percent.

Some interesting facts are that being a racist is not significant and victims of racial discrimination had a small but positive odd of being admitted. These results will be discussed in more detail later as I compare these results to other years in Section 5.3.3.

Table 5.12. Logit: Percentage Change in Odds (2008 Passing Avg. Score Full Model)

Odds of: yes vs. no

Variables ($pavg$)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.43115	-11.413	0.000	-35.0	-17.1	0.4347
Brown	-1.08716	-11.170	0.000	-66.3	-23.4	0.2457
Indigenous	-0.87562	-2.821	0.005	-58.3	-5.9	0.0696
Asian	0.37001	8.936	0.000	44.8	6.7	0.1756
Victim	0.13328	3.468	0.001	14.3	4.3	0.3146
Racist	-0.02851	-0.484	0.629	-2.8	-0.4	0.1579
Female	-0.76434	-35.715	0.000	-53.4	-31.3	0.4918
Age	0.13646	16.578	0.000	14.6	26.2	1.7070
Public school	-1.65841	-50.475	0.000	-81.0	-52.6	0.4504
Prep course	0.81314	35.038	0.000	125.5	31.3	0.3347
Income	0.43724	45.278	0.000	54.8	70.9	1.2255
Mother Education						
High school graduate	0.05299	1.642	0.101	5.4	2.3	0.4295
Some college	0.27284	6.355	0.000	31.4	6.0	0.2150
College graduate	0.51791	19.084	0.000	67.9	21.3	0.3729
Unknown	-0.52218	-4.251	0.000	-40.7	-7.2	0.1429

$N = 300870$
b = raw coefficient
z = z-score fore test of $b = 0$
$P > z$ = p-value for z-test
% = percentage change in odds for unit increase in X
$\%StdX$ = percentage change in odds for SD increase in X
$SDofX$ = standard deviation of X

Looking at the most competitive major, Medicine, both the black and brown variables are significant at .05 and that the indigenous variable lost its significance. The reason is that only .25% (1) out of 1,462 indigenous students fell into this category. Tables 5.13 and 5.14 show the distributions for acceptance in Medicine and in Natural Sciences. In both majors, it becomes clear that there is a significant disparity between races that could have been admitted to the University of São Paulo from the total population of students.

The odds of being accepted into Medicine is 85.6 percent smaller for students from public schools. The odds of being accepted are 63.2 percent smaller for females, 35.8 percent smaller for blacks, and 89.9 percent smaller for browns, holding everything else constant. On the

Table 5.13. Race vs. Acceptance in Medicine USP - 2008

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	329	28	1	1	44	403
	81.64%	**6.95%**	**0.25%**	**0.25%**	**10.92%**	100%
No	194,008	76,055	19,407	1,462	9,535	300,467
	64.57%	25.31%	6.46%	0.49%	3.17%	100%
Total	194,337	76,083	19,408	1,463	9,579	300,870
	64.59%	**25.29%**	**6.45%**	**0.49%**	**3.18%**	100%

Table 5.14. Race vs. Acceptance in Natural Sciences USP - 2008

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	47,713	6,992	1,376	86	3,742	59,909
	79.64%	**11.67%**	**2.30%**	**0.14%**	**6.25%**	100%
No	146,624	69,091	18,032	1,377	5,837	240,961
	60.85%	28.67%	7.48%	0.57%	2.42%	100%
Total	194,337	76,083	19,408	1,463	9,579	300,870
	64.59%	**25.29%**	**6.45%**	**0.49%**	**3.18%**	100%

other hand, going to a prep course, having a mother with a college degree, having a high income and being Asian, increases the odds by 79.2 percent, 34.7 percent, 65.7 percent and 85.7 percent respectively.

When looking at the major that had the lowest ENEM score in 2008, Natural Sciences, I find similar results. Looking at the race variables, the odds of being accepted are 35.6 percent smaller for blacks, 52.5 percent smaller for browns and 59.6 percent smaller for indigenous students. On the other hand, being Asian increases the odds significantly. Here again, one of the variables with the largest influence is public school and prep course. The odds of being accepted into Natural Sciences are 74.2 percent smaller for public high school students than for students coming from private school and going to a preparatory *vestibular* school increases the odds of acceptance by 134 percent. Also, mother's educational attainment is

Table 5.15. Logit: Percentage Change in Odds (2008 Passing Medicine - Full Model)

Odds of: yes vs no

Variables (*pmed*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.44263	-2.168	0.030	-35.8	-17.5	0.4347
Brown	-2.28991	-2.274	0.023	-89.9	-43.0	0.2457
Indigenous	0.23205	0.230	0.818	26.1	1.6	0.0696
Asian	0.61922	3.600	0.000	85.7	11.5	0.1756
Victim	-0.02583	-0.139	0.890	-2.6	-0.8	0.3146
Racist	-0.06460	-0.235	0.814	-6.3	-1.0	0.1579
Female	-0.99859	-9.119	0.000	-63.2	-38.8	0.4918
Age	0.21114	5.472	0.000	23.5	43.4	1.7070
Public school	-1.93457	-10.020	0.000	-85.6	-58.2	0.4504
Prep course	0.58359	5.362	0.000	79.2	21.6	0.3347
Income	0.50481	11.349	0.000	65.7	85.6	1.2255
Mother Education						
High school graduate	-0.43295	-2.443	0.015	-35.1	-17.0	0.4295
Some college	-0.14088	-0.638	0.523	-13.1	-3.0	0.2150
College graduate	0.29810	2.427	0.015	34.7	11.8	0.3729
Unknown	-1.64151	-1.632	0.103	-80.6	-20.9	0.1429

$N = 300870$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

directly related to an increase in the acceptance rate. The higher the level of education of the student's mother the higher the odds of being accepted while not knowing mother's education lowers the odds of being accepted by 27.6 percent and having a mother with high school diploma increases the odds by 31.4 percent. Having a mother with higher education has an even greater influence: while some college increases the odds by 68.3 percent, having a mother with college education increases the odds by 79.7 percent, holding everything else constant. See Table 5.16.

Table 5.16. Logit: Percentage Change in Odds (2008 Passing Natural Sciences - Full Model)

Odds of: yes vs no						
Variables (*pnsci*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.43989	-28.186	0.000	-35.6	-17.4	0.4347
Brown	-0.74374	-23.178	0.000	-52.5	-16.7	0.2457
Indigenous	-0.90624	-7.517	0.000	-59.6	-6.1	0.0696
Asian	0.32861	12.511	0.000	38.9	5.9	0.1756
Victim	0.19702	10.033	0.000	21.8	6.4	0.3146
Racist	-0.03701	-1.123	0.261	-3.6	-0.6	0.1579
Female	-0.62410	-57.261	0.000	-46.4	-26.4	0.4918
Age	-0.03570	-8.388	0.000	-3.5	-5.9	1.7070
Public school	-1.35476	-101.652	0.000	-74.2	-45.7	0.4504
Prep course	0.85074	60.895	0.000	134.1	32.9	0.3347
Income	0.42355	78.834	0.000	52.7	68.0	1.2255
Mother Education						
High school graduate	0.27312	19.595	0.000	31.4	12.4	0.4295
Some college	0.52067	23.493	0.000	68.3	11.8	0.2150
College graduate	0.58612	40.192	0.000	79.7	24.4	0.3729
Unknown	-0.32267	-6.512	0.000	-27.6	-4.5	0.1429

$N = 300870$
b = raw coefficient
z = z-score fore test of $b = 0$
$P > z$ = p-value for z-test
% = percentage change in odds for unit increase in X
$\%StdX$ = percentage change in odds for SD increase in X
$SDofX$ = standard deviation of X

2007. For the year of 2007, the ENEM scores were much lower among students accepted at USP compared to the other four years in this analysis. However, the lowest ENEM score of a student accepted at USP was again in the Natural Sciences major. Every student who made an ENEM score ≥ 26.83 was assigned a dummy variable, *pnsci*, to indicate that s/he would have exceeded the threshold for acceptance in this particular major. Because this was the major with the lowest ENEM score, this student would only have passed at USP if s/he had chosen this major. The highest ENEM scores were found in the Medicine major and the students who were accepted scored ≥ 54.37. A dummy variable, *pmed*, was also created for students who would have exceeded the threshold grade for Medicine. Looking at the

average score of all students accepted at USP, a student would have had to score ≥ 42.6 on average to be accepted in 2007. A dummy variable, *pavg*, was created to indicate students who would have met this criteria. This is illustrated in Figure 5.2.

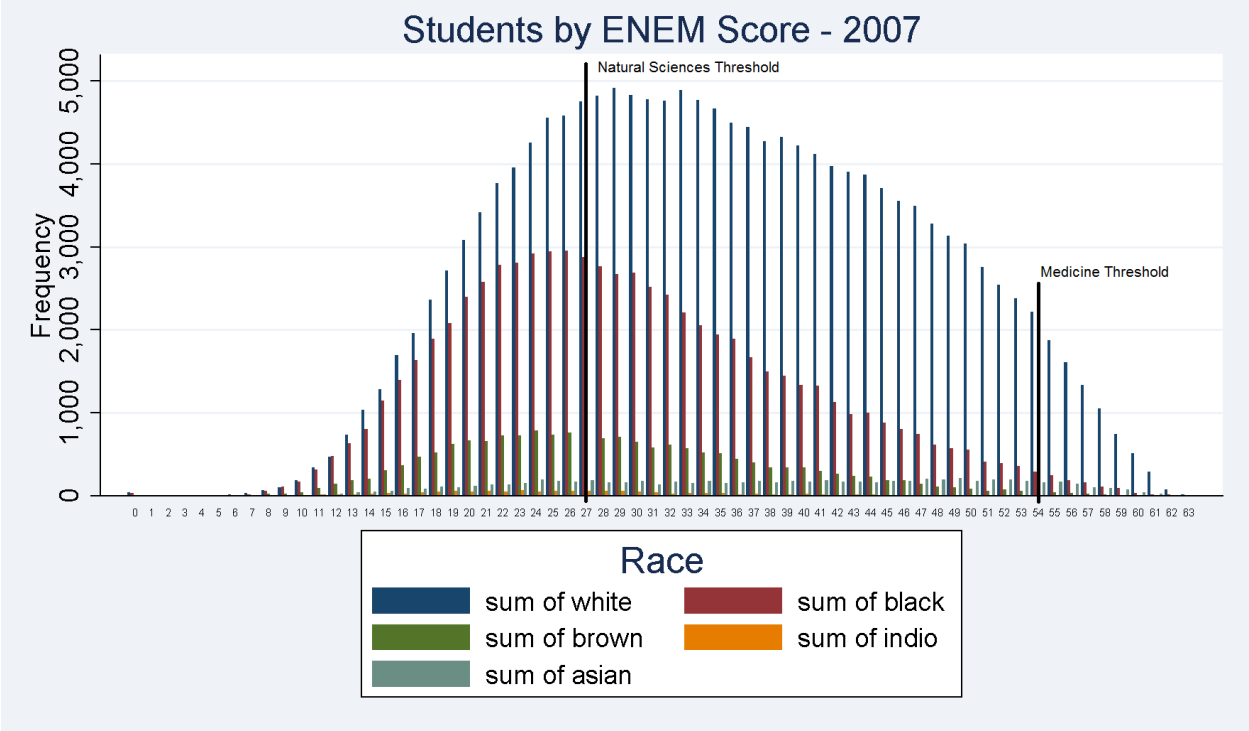

Figure 5.2. ENEM Score Distribution by Race

The logit regression estimates can be found at Appendix D.13 and the percent change in odds can be found in Tables 5.19, 5.20, and 5.21. Because of the small number of indigenous students who would have passed in Medicine, that variable loses statistical significance. As shown in Table 5.17 and Table 5.18, even though the ENEM scores were much lower in 2007, there is a significant disparity among racial groups.

Looking at the logit results for Medicine in column (3), it is evident that the variable indigenous loses statistical significance compared to the results for Natural Sciences (*pnsci*) in column (3) and for the average score (*pavg*) columns (see Appendix D.13). The main

Table 5.17. Race vs. Acceptance in Medicine USP - 2007

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	7,515	885	135	20	676	9,231
	81.41%	**9.59%**	**1.46%**	**0.22%**	**7.32%**	100%
No	151,576	70,234	17,671	1,326	6,646	247,453
	61.25%	28.38%	7.14%	0.54%	2.69%	100%
Total	159,091	71,119	17,806	1,346	7,322	256,684
	61.98%	**27.71%**	**6.94%**	**0.52%**	**2.85%**	100%

Table 5.18. Race vs. Acceptance in Natural Sciences USP - 2007

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	118,416	40,947	9,685	649	5,619	175,316
	67.54%	**23.36%**	**5.52%**	**0.37%**	**3.21%**	100%
No	40,675	30,172	8,121	697	1,703	81,368
	49.99%	37.08%	9.98%	0.86%	2.09%	100%
Total	159,091	71,119	17,806	1,346	7,322	256,684
	61.98%	**27.71%**	**6.94%**	**0.52%**	**2.85%**	100%

reason is that out of 9,231 students who would meet the threshold to pass in Medicine only 20 were indigenous, this is illustrated on Table 5.17.

Although the ENEM scores were much lower compared to other years, the results indicate the same trends seen in the year 2008. Looking at the average score (*pavg*), the odds of acceptance is 32.9 percent smaller for blacks, 48.1 percent smaller for browns and 50.5 percent smaller for indigenous, holding everything else constant. On the other hand, being Asian increases the odds of passing by 19.3 percent. Public school and prep course had a significant effect as well. Studying in a public high school lowers the odds by 77.7 percent while taking a preparatory course, the *cursinho*, increases the odds by 98.8 percent. It is also clear that the higher the education of the mother, the higher the odds of passing in this category. Refer to Table 5.19 for results.

Table 5.19. Logit: Percentage Change in Odds (2007 Passing Avg. Score - Full Model)

Odds of: yes vs no

Variables ($pavg$)	b	z	$P > \|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.39902	-26.665	0.000	-32.9	-16.4	0.4476
Brown	-0.65641	-21.779	0.000	-48.1	-15.4	0.2541
Indigenous	-0.70314	-6.589	0.000	-50.5	-5.0	0.0722
Asian	0.17608	5.716	0.000	19.3	3.0	0.1665
Victim	0.18271	9.017	0.000	20.0	6.0	0.3193
Racist	-0.03197	-0.857	0.391	-3.1	-0.5	0.1505
Female	-0.65562	-57.054	0.000	-48.1	-27.5	0.4914
Age	-0.19592	-37.668	0.000	-17.8	-30.5	1.8588
Public school	-1.49926	-107.628	0.000	-77.7	-47.1	0.4243
Prep course	0.68711	41.001	0.000	98.8	23.0	0.3010
Income	0.38490	66.211	0.000	46.9	58.8	1.2014
Mother Education						
High school graduate	0.33750	24.166	0.000	40.1	15.3	0.4229
Some college	0.57948	24.172	0.000	78.5	12.7	0.2068
College graduate	0.64695	39.769	0.000	91.0	25.1	0.3461
Unknown	-0.33702	-6.620	0.000	-28.6	-4.7	0.1433

$N = 256684$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

The percentages are magnified for the most competitive major of Medicine. See Table 5.20. The odds of being accepted are 35.7 percent smaller for blacks, and 57 percent smaller for brown, holding everything else constant. Asian students' odds of being accepted is 39.4 percent larger. The odds of passing in Medicine are lowered by 57.1 percent for females than males, and 11.9 percent for older students, holding everything else constant. Also, studying in a public school lowers the odds by 80.8 percent on average, while taking a prep course increases by 107.3 percent, holding everything else constant. Not surprisingly, an increase in the income category, increases the odds of that student passing in Medicine by 52.3 percent. Here again, the more educated the mother of a student is, the higher the odds of passing

Table 5.20. Logit: Percentage Change in Odds (2007 Passing Medicine - Full Model)

Odds of: yes vs no

Variables (*pmed*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.44169	-11.466	0.000	-35.7	-17.9	0.4476
Brown	-0.84400	-9.205	0.000	-57.0	-19.3	0.2541
Indigenous	-0.05961	-0.256	0.798	-5.8	-0.4	0.0722
Asian	0.33200	6.977	0.000	39.4	5.7	0.1665
Victim	0.16741	3.994	0.000	18.2	5.5	0.3193
Racist	0.09190	1.402	0.161	9.6	1.4	0.1505
Female	-0.84617	-36.326	0.000	-57.1	-34.0	0.4914
Age	-0.12630	-9.856	0.000	-11.9	-20.9	1.8588
Public school	-1.65028	-49.061	0.000	-80.8	-50.4	0.4243
Prep course	0.72909	26.446	0.000	107.3	24.5	0.3010
Income	0.42046	38.532	0.000	52.3	65.7	1.2014
Mother Education						
High school graduate	0.11605	3.493	0.000	12.3	5.0	0.4229
Some college	0.27324	5.994	0.000	31.4	5.8	0.2068
College graduate	0.48189	16.197	0.000	61.9	18.1	0.3461
Unknown	-0.67023	-4.756	0.000	-48.8	-9.2	0.1433

$N = 256684$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

in Medicine. The odds of being accepted is 12.3 percent higher for students whose mother had high school only, compared to 61.9 percent higher for students whose mother is a college graduate. Not knowing mother's education, which could indicate that the student was not raised by his/her mother, lowers the odds of being accepted into Medicine by 48.8 percent, holding everything else constant.

Looking at the major that had the lowest ENEM score, Natural Sciences, even though the threshold was much lower for this major, minority groups are still at a great disadvantage. Being black, brown and indigenous lowers the odds of being accepted in Natural Sciences by 29.1 percent, 39.1 percent and 49.4 percent, holding everything else constant. Table

Table 5.21. Logit: Percentage Change in Odds (2007 Passing Natural Sciences - Full Model)

Odds of: yes vs no

Variables (*pnsci*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.34322	-33.074	0.000	-29.1	-14.2	0.4476
Brown	-0.49610	-27.261	0.000	-39.1	-11.8	0.2541
Indigenous	-0.68156	-11.729	0.000	-49.4	-4.8	0.0722
Asian	-0.15162	-4.770	0.000	-14.1	-2.5	0.1665
Victim	0.15005	10.006	0.000	16.2	4.9	0.3193
Racist	-0.23100	-7.432	0.000	-20.6	-3.4	0.1505
Female	-0.28679	-29.858	0.000	-24.9	-13.1	0.4914
Age	-0.07538	-31.884	0.000	-7.3	-13.1	1.8588
Public school	-1.62289	-78.733	0.000	-80.3	-49.8	0.4243
Prep course	0.29309	16.974	0.000	34.1	9.2	0.3010
Income	0.34161	64.566	0.000	40.7	50.7	1.2014
Mother Education						
High school graduate	0.35783	30.580	0.000	43.0	16.3	0.4229
Some college	0.55134	19.172	0.000	73.6	12.1	0.2068
College graduate	0.53902	26.160	0.000	71.4	20.5	0.3461
Unknown	-0.33874	-11.289	0.000	-28.7	-4.7	0.1433

$N = 256684$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

5.18 shows the percentage of minorities who would have been accepted and there's a great disparity in comparison with the total population. Only whites and Asians have a percentage of acceptance that is greater than their distribution in the total population. One interesting finding is that Asian is negative for this particular major, whereas for majors that require a higher ENEM score it is positive. The main reason is because a greater number of white students were able to meet this threshold in comparison to other racial groups since the threshold was much lower in comparison to other years. One of the most significant variables is public school, the odds of being accepted are lowered by 80.3 percent for students who

studied at public high schools. The other variables were all significant and the results are shown in Table 5.21.

2006. In the year of 2006, there are some disturbing findings. No brown or indigenous student met the threshold for acceptance in Medicine. Again, there's a significant disparity among racial groups and acceptance at USP as indicated in the Tables 5.22 and 5.23 for both Medicine and Natural Sciences, which again had the lowest ENEM scores of students accepted at USP.

Table 5.22. Race vs. Acceptance in Medicine USP - 2006

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	202	13	0	0	29	244
	82.79%	**5.33%**	**0%**	**0%**	**11.89%**	100%
No	174,895	77,601	19,852	1,865	8,196	282,409
	61.93%	27.48%	7.03%	0.66%	2.90%	100%
Total	175,097	77,614	19,852	1,865	8,225	282,653
	61.95%	**27.46%**	**7.02%**	**0.66%**	**2.91%**	100%

Table 5.23. Race vs. Acceptance in Natural Sciences USP - 2006

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	27,865	4,435	748	79	2,150	35,277
	78.99%	**12.57%**	**2.12%**	**0.22%**	**6.09%**	100%
No	147,232	73,179	19,104	1,786	6,075	247,376
	59.52%	29.58%	7.72%	0.72%	2.46%	100%
Total	175,097	77,614	19,852	1,865	8,225	282,653
	61.95%	**27.46%**	**7.02%**	**0.66%**	**2.91%**	100%

Every student who made an ENEM score ≥ 34.84 was assigned a dummy variable, *pnsci*, to indicate that s/he would have exceeded the threshold for acceptance in this particular major. Because this was the major with the lowest ENEM score, this student would only

have passed at USP if s/he had chosen this major. The highest ENEM scores were found in the Medicine major and the students who were accepted scored $\geq$ 56.44. A dummy variable, *pmed*, was also created for students who would have exceeded the threshold grade for Medicine. Looking at the average score of all students accepted into USP, a student would have had to score $\geq$ 46.34 on average to be accepted in 2006. A dummy variable, *pavg*, was created to indicate students who would have met this criteria. This is illustrated in Figure 5.3.

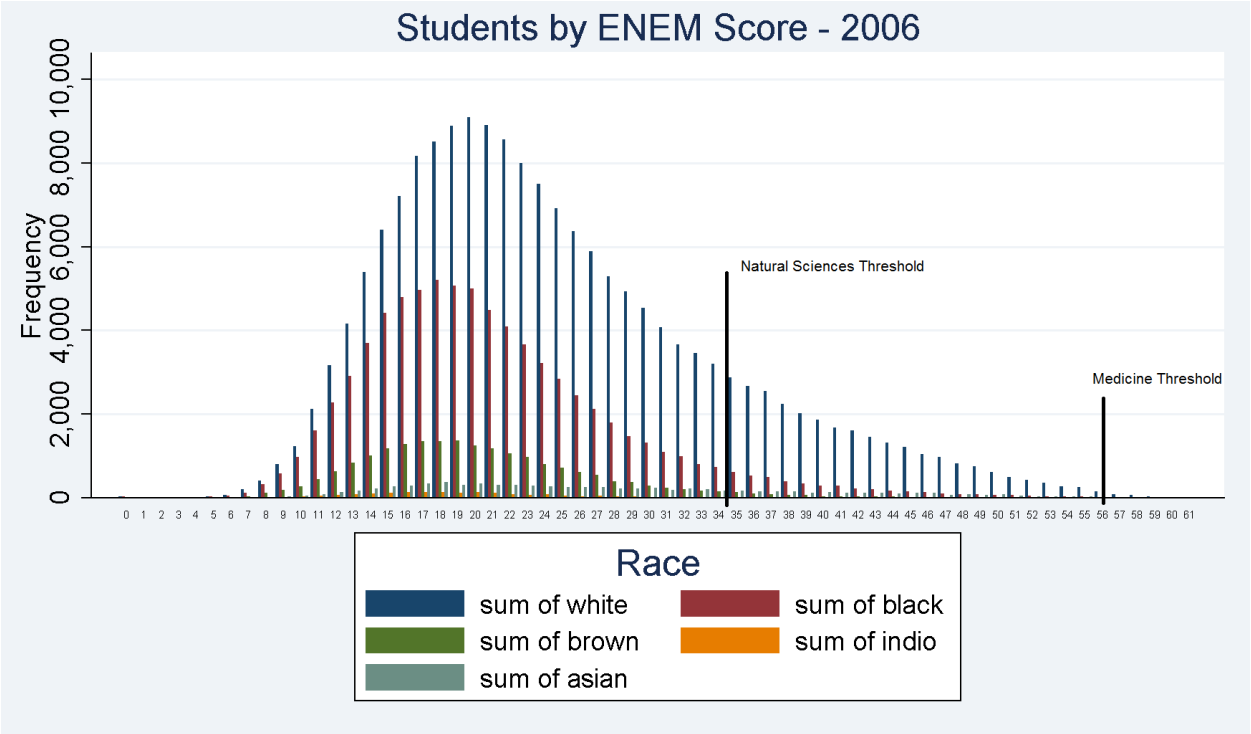

Figure 5.3. ENEM Score Distribution by Race

The logit regression estimates can be found at Appendix D.14 and the percent change in odds can be found in Tables 5.24, 5.25, and 5.26. Because no brown and indigenous students passed in Medicine, these variables were omitted from the analysis. As shown in the Tables 5.22 and 5.23, in this particular year, there is a significant disparity among racial groups. It is appalling that out of 19,852 students who self classify as brown none would

have passed in this particular major. Notice that only 13 black students out of 77,601 would have met the criteria for acceptance. Even when looking at the Natural Sciences major, the percentage distribution of students who would have been accepted is not representative of the population.

The logit results for Medicine in column (3), indicate that the variable black loses statistical significance compared to the results for Natural Sciences (*pnsci*) in column (3) and for the average score (*pavg*) columns, but is still significant at the 0.05 level (see Appendix D.14). The main reason being the fact that only 13 black students would fit into this category, see Table 5.22.

Table 5.24. Logit: Percentage Change in Odds (2006 Passing Medicine - Full Model)

Odds of: yes vs no

Variables (*pmed*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.66511	-2.292	0.022	-48.6	-25.7	0.4463
Asian	0.75732	3.568	0.000	113.3	13.6	0.1681
Victim	-0.06925	-0.306	0.759	-6.7	-2.2	0.3257
Racist	0.21592	0.748	0.454	24.1	3.8	0.1724
Female	-1.38219	-9.187	0.000	-74.9	-49.2	0.4902
Age	-0.00417	-0.055	0.956	-0.4	-0.8	1.8605
Public school	-3.19871	-9.165	0.000	-95.9	-73.5	0.4157
Prep course	0.34820	2.118	0.034	41.7	10.5	0.2871
Income	0.46101	7.865	0.000	58.6	74.8	1.2115
Mother Education						
High school graduate	-0.25660	-1.128	0.259	-22.6	-10.1	0.4140
Some college	0.08190	0.298	0.766	8.5	1.6	0.1995
College graduate	0.45110	2.726	0.006	57.0	16.5	0.3389
Unknown	-0.05037	-0.084	0.933	-4.9	-0.8	0.1558

$N = 282653$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

Looking at the most competitive major, which is Medicine, mother's education loses statistical significance. The only category that is still significant at 0.01 and seems to matter is mother with a college degree. Not knowing the mother's education, or having a mother with high school diploma or some college is not statistically significant. Age also loses significance. See Table 5.24. The odds of being accepted is 48.6 percent smaller for blacks, holding everything else constant. On the other hand, the odds of being accepted is increased by 113.3 percent for Asian students. The odds of passing in Medicine are lowered by 74.9 percent for females than males, holding everything else constant. Also, studying in a public school lowers the odds by 95.9 percent on average, while taking a prep course increases by 41.7 percent, holding everything else constant. Not surprisingly, an increase in the income category increases the odds of passing in Medicine by 58.6 percent.

Looking at the average score (*pavg*), the odds of passing in this category is 34.7 percent smaller for blacks, and 66.9 percent smaller for browns, holding everything else constant. On the other hand, being Asian increases the odds of passing by 54.9 percent. Public school and prep course had a significant effect as well. Studying in a public high school lowers the odds by 87.7 percent while taking a preparatory course, the *cursinho*, increases the odds by 103 percent. It is also clear that the higher the education of the mother, the higher the odds of passing in this category. Refer to Table 5.25 for results.

Looking at the major that had the lowest ENEM score, which is Natural Sciences, being black, brown and indigenous lowers the odds of being accepted in Natural Sciences by 31.7 percent, 53.8 percent and 47.3 percent, holding everything else constant. Table 5.23 shows the percentage of minorities who would have been accepted and there is a great disparity in comparison with the total population. Only whites and Asians have a percentage of acceptance that is greater than their distribution in the total population. The odds of passing in Natural Sciences are increased by 34 percent for Asian students, holding everything else constant. Female students are also at a disadvantage here. The odds of passing in this

Table 5.25. Logit: Percentage Change in Odds (2006 Passing Avg. Score - Full Model)

Odds of: yes vs no

Variables ($pavg$)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.42639	-9.116	0.000	-34.7	-17.3	0.4463
Brown	-1.10673	-8.483	0.000	-66.9	-24.6	0.2555
Indigenous	-0.93249	-2.563	0.010	-60.6	-7.3	0.0810
Asian	0.43782	8.358	0.000	54.9	7.6	0.1681
Victim	0.14816	3.129	0.002	16.0	4.9	0.3257
Racist	-0.00188	-0.028	0.978	-0.2	-0.0	0.1724
Female	-1.01219	-36.670	0.000	-63.7	-39.1	0.4902
Age	-0.07977	-5.410	0.000	-7.7	-13.8	1.8605
Public school	-2.09404	-47.585	0.000	-87.7	-58.1	0.4157
Prep course	0.70793	21.166	0.000	103.0	22.5	0.2871
Income	0.40447	32.475	0.000	49.9	63.2	1.2115
Mother Education						
High school graduate	0.05789	1.417	0.157	6.0	2.4	0.4140
Some college	0.26683	4.894	0.000	30.6	5.5	0.1995
College graduate	0.53616	15.439	0.000	70.9	19.9	0.3389
Unknown	-0.64181	-4.121	0.000	-47.4	-9.5	0.1558

$N = 282653$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

category are lowered by 57.9 percent on average for females than males. One of the most significant variables is public school, the odds of being accepted are lowered by 80.1 percent for students who studied at public high schools. While taking a prep course increases the odds by 104.5 percent. Income is also significant, one increase in the income category increases the odds by 46.2 percent. Here, there is a clear relationship between mother's education and acceptance. The higher the mother's education, the higher the odds of passing in this particular major. It is important to emphasize again, that a student who scored 34.84 on the ENEM would only be able to pass in this particular major of Natural Sciences whereas

Table 5.26. Logit: Percentage Change in Odds (2006 Passing Natural Sciences - Full Model)

Odds of: yes vs no

Variables (*pnsci*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.38068	-19.810	0.000	-31.7	-15.6	0.4463
Brown	-0.77280	-18.392	0.000	-53.8	-17.9	0.2555
Indigenous	-0.64000	-5.131	0.000	-47.3	-5.0	0.0810
Asian	0.29246	9.146	0.000	34.0	5.0	0.1681
Victim	0.20224	8.531	0.000	22.4	6.8	0.3257
Racist	-0.02436	-0.659	0.510	-2.4	-0.4	0.1724
Female	-0.86407	-63.853	0.000	-57.9	-34.5	0.4902
Age	-0.18509	-27.198	0.000	-16.9	-29.1	1.8605
Public school	-1.61586	-96.230	0.000	-80.1	-48.9	0.4157
Prep course	0.71536	37.168	0.000	104.5	22.8	0.2871
Income	0.37946	58.196	0.000	46.2	58.4	1.2115
Mother Education						
High school graduate	0.31274	17.884	0.000	36.7	13.8	0.4140
Some college	0.50750	18.572	0.000	66.1	10.7	0.1995
College graduate	0.63502	35.231	0.000	88.7	24.0	0.3389
Unknown	-0.48163	-7.708	0.000	-38.2	-7.2	0.1558

$N = 282653$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

a student who met the threshold for Medicine would have been able to pass in any major offered at this particular year.

2005. For the year of 2005, the lowest ENEM score was in Audiology major at Santa Casa campus. Thus, every student who made an ENEM score ≥ 24.29 was assigned a binary variable, $pfonosc$, to indicate that s/he would have exceeded the threshold for acceptance in this particular major. Because this was the major with the lowest ENEM score, this student would only have passed at USP if s/he had chosen this major. The highest ENEM scores were found in the Medicine major and the students who were accepted scored ≥ 57.73. A binary variable, *pmed*, was also created for students who would have exceeded the threshold

grade for Medicine. Looking at the average score of all students accepted into USP, a student would have had to score ≥ 48.66 on average to be accepted in 2005. A binary variable, *pavg*, was created to indicate students who would have met this criteria. Refer to Figure 5.4.

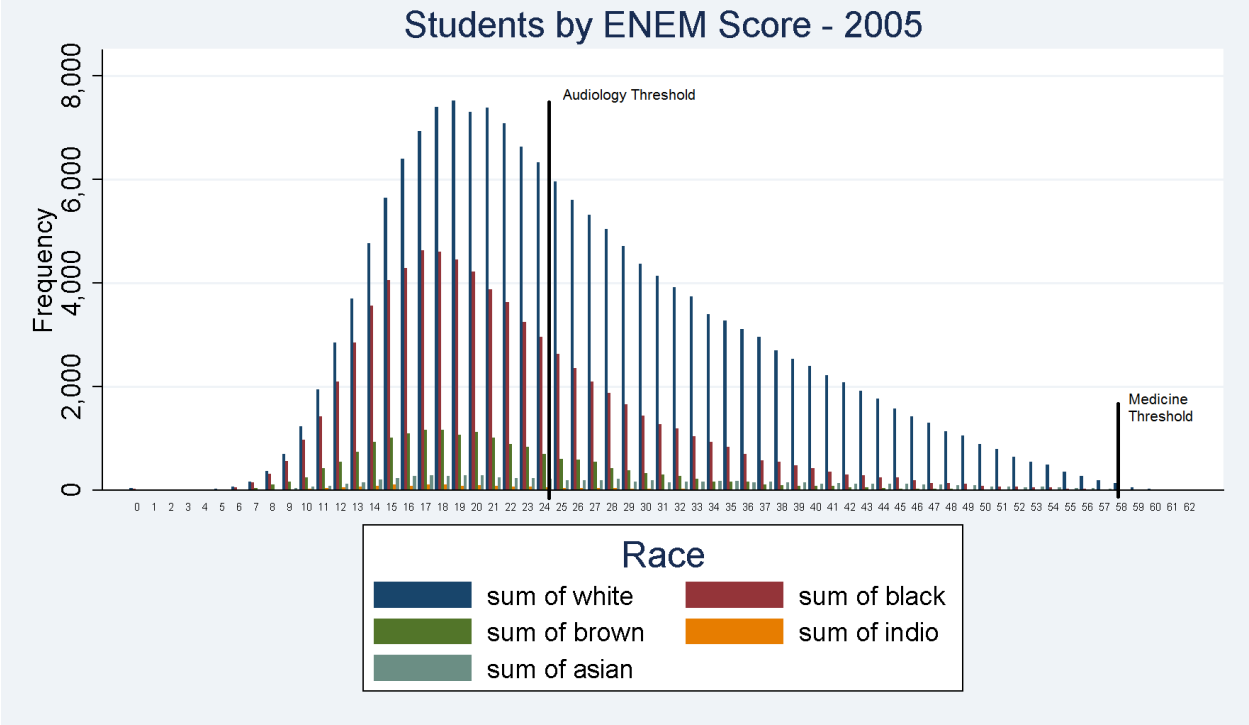

Figure 5.4. ENEM Score Distribution by Race

The logit regression estimates can be found at Appendix D.15 and the percent change in odds can be found in Tables 5.29, 5.30, and 5.31.

These results indicate that no brown student, out of 18,219 students in this category, would have passed in Medicine. Also the results for indigenous and black students are pretty alarming.

Out of 1,326 indigenous students only 1 would have passed, and out of 74,485 black students only 29 would have passed. Thus a significant disparity among racial groups and acceptance at USP is indicated in Tables 5.27 and 5.28. As a result, in my analysis brown is not included for Medicine, and the variables blacks and indigenous are not statistically

Table 5.27. Race vs. Acceptance in Medicine USP - 2005

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	237	29	0	1	28	295
	80.34%	**9.83%**	**0%**	**0.34%**	**9.49%**	100%
No	166,266	74,485	18,219	1,563	7,466	267,999
	62.04%	27.79%	6.80%	0.54%	2.79%	100%
Total	166,503	74,514	18,219	1,564	7,494	268,294
	62.06%	**27.77%**	**6.80%**	**0.58%**	**2.79%**	100%

Table 5.28. Race vs. Acceptance in Audiology USP - 2005

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	82,046	22,502	4,929	396	4,231	114,104
	71.90%	**19.72%**	**4.32%**	**0.35%**	**3.71%**	100%
No	84,457	52,012	13,290	1,168	3,263	154,190
	54.77%	33.73%	8.62%	0.76%	2.12%	100%
Total	166,503	74,514	18,219	1,564	7,494	268,294
	62.06%	**27.77%**	**6.79%**	**0.58%**	**2.79%**	100%

significant. Even though the lowest category, $pfonosc$, had a much lower ENEM score than in previous years, when looking at the Audiology major, the percentage distribution of students who would have been accepted is still not representative of the population.

In addition, no students were admitted in Medicine who did not know their mother's education, thus this variable was also omitted from the model.

The results for students who would have passed the most competitive major, Medicine, show that mother's education loses statistical significance except for college graduates. Having a mother with a high school diploma or some college is not statistically significant. Age also loses significance. Refer to Table 5.29. The odds of being accepted is increased by 76.2 percent for Asian students. While, the odds of passing in Medicine are lowered by 69.2 percent for females than males, holding everything else constant. Also, studying in a public

Table 5.29. Logit: Percentage Change in Odds (2005 Passing Medicine - Full Model)

Odds of: yes vs no

Variables (*pmed*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	0.05695	0.280	0.779	5.9	2.6	0.4479
Indigenous	0.67528	0.668	0.504	96.5	5.3	0.0761
Asian	0.56655	2.654	0.008	76.2	9.8	0.1648
Victim	0.06113	0.308	0.758	6.3	2.0	0.3266
Racist	0.18816	0.743	0.457	20.7	3.2	0.1658
Female	-1.17733	-8.980	0.000	-69.2	-43.8	0.4890
Age	-0.07312	-1.011	0.312	-7.1	-12.6	1.8448
Public school	-2.99110	-10.497	0.000	-95.0	-70.3	0.4059
Prep course	0.62038	4.500	0.000	86.0	19.3	0.2840
Income	0.49873	9.164	0.000	64.7	79.7	1.1748
Mother Education						
High school graduate	-0.33910	-1.633	0.103	-28.8	-12.9	0.4078
Some college	0.22452	0.965	0.334	25.2	4.5	0.1952
College graduate	0.45065	2.949	0.003	56.9	15.9	0.3280

$N = 268294$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

school lowers the odds by 95 percent on average, while taking a prep course increases the odds by 86 percent, holding everything else constant. Not surprisingly, an increase in the income category, increases the odds of passing in Medicine by 64.7 percent.

Looking at the average score (*pavg*), the odds of passing in this category is 36.6 percent smaller for blacks, and 74.3 smaller for browns, holding everything else constant. On the other hands, being Asian increases the odds of passing by 58.5 percent.

Studying in a public high school lowers the odds by 88.7 percent while taking a preparatory course, the *cursinho*, increases the odds by 100.6 percent. It is also clear that the higher the education of the mother, the higher the odds of passing in this category. While a mother

Table 5.30. Logit: Percentage Change in Odds (2005 Passing Avg. Score - Full Model)

Odds of: yes vs no

Variables ($pavg$)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.45600	-9.446	0.000	-36.6	-18.5	0.4479
Brown	-1.35679	-9.062	0.000	-74.3	-28.9	0.2516
Indigenous	-0.65417	-1.905	0.057	-48.0	-4.9	0.0761
Asian	0.46081	8.733	0.000	58.5	7.9	0.1648
Victim	0.22406	4.757	0.000	25.1	7.6	0.3266
Racist	0.05811	0.897	0.370	6.0	1.0	0.1658
Female	-0.89207	-32.802	0.000	-59.0	-35.4	0.4890
Age	-0.10555	-6.839	0.000	-10.0	-17.7	1.8448
Public school	-2.18409	-49.491	0.000	-88.7	-58.8	0.4059
Prep course	0.69638	20.854	0.000	100.6	21.9	0.2840
Income	0.37789	29.389	0.000	45.9	55.9	1.1748
Mother Education						
High school graduate	0.20931	5.107	0.000	23.3	8.9	0.4078
Some college	0.44251	8.274	0.000	55.7	9.0	0.1952
College graduate	0.67351	18.484	0.000	96.1	24.7	0.3280
Unknown	-0.92724	-4.487	0.000	-60.4	-12.8	0.1472

$N = 268294$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

with high school diploma increases the odds by 23.3 percent, having a mother with college degree can increase the odds by 96.1 percent. Refer to Table 5.30 for results.

Table 5.31. Logit: Percentage Change in Odds (2005 Passing Audiology - Full Model)

Odds of: yes vs no

Variables ($pfonosc$)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	-0.30944	-29.106	0.000	-26.6	-12.9	0.4479
Brown	-0.48862	-24.318	0.000	-38.7	-11.6	0.2516
Indigenous	-0.56813	-8.969	0.000	-43.3	-4.2	0.0761
Asian	-0.01225	-0.429	0.668	-1.2	-0.2	0.1648
Victim	0.17136	11.458	0.000	18.7	5.8	0.3266
Racist	-0.10580	-3.779	0.000	-10.0	-1.7	0.1658
Female	-0.37961	-41.228	0.000	-31.6	-16.9	0.4890
Age	-0.14846	-49.914	0.000	-13.8	-24.0	1.8448
Public school	-1.53518	-105.754	0.000	-78.5	-46.4	0.4059
Prep course	0.39387	24.796	0.000	48.3	11.8	0.2840
Income	0.30242	60.865	0.000	35.3	42.7	1.1748
Mother Education						
High school graduate	0.39552	35.683	0.000	48.5	17.5	0.4078
Some college	0.67724	27.931	0.000	96.8	14.1	0.1952
College graduate	0.72267	42.750	0.000	106.0	26.7	0.3280
Unknown	-0.47436	-13.702	0.000	-37.8	-6.7	0.1472

$N = 268294$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

Looking at the major that had the lowest ENEM score, which is Audiology, being black, brown and indigenous lowers the odds of being accepted in Audiology by 26.6 percent, 38.7 percent and 43.3 percent, holding everything else constant. It is important to emphasize that because the score of 24.29 is such a low threshold, many more white students would have been admitted in comparison to other years. The variable Asian loses statistical significance. Table 5.28 shows the percentage of minorities who would have been accepted and there's a great disparity in comparison with the total population. Again, only whites and Asians have a percentage of acceptance that is greater than their distribution in the total population.

Female students remain at a disadvantage, since the odds of passing in this category is lowered by 31.6 percent on average for females than males.

One of the most significant variables is public school, the odds of being accepted are lowered by 78.5 percent for students who studied at public high schools. While taking a prep course increases the odds by 48.3 percent. Income is also significant, one increase in the income category increases the odds by 35.3 percent.

There is a clear relationship between mother's education and acceptance in Audiology. The higher the mother's education, the higher the odds of passing in this particular major. While having a mother with high school degree increases the odds by 48.5 percent, having a mother with a college degree increases the odds by 106 on average, holding everything else constant.

It is important to emphasize again, that a student who scored 24.29 on the ENEM would only be able to pass in this particular major whereas a student who met the threshold for Medicine would have been able to pass in any major offered in 2005.

2004. Before presenting the results of 2004, one important fact that needs to be addressed is that comparing 2004 with other years, the number of students taking the ENEM exam nationwide doubled from 2004 to 2005. Refer to Table 2.1 in chapter 2. Even within the state of São Paulo there are about 18,500 thousand students missing in 2004 compared with 2005 and other years. As a result, in 2004 there are many fewer black and brown students in comparison with 2005 and later years. In 2005, there were 74,514 black students whereas in 2004 there were only 1,204, and 18,219 brown students versus 1,028. Another problem already discussed in previous chapters is that many people who self-classify as white are in fact Afro-descendant and could have been included in the brown or black category. Because race definition and identity is so complex in Brazil, one have to rely on self-classification, regardless of outward appearances and one's own perceptions of race. Thus, the results for

the year 2004 need to be analyzed with cautious since this bias in racial classification could have affected the results. Figure 5.5 clearly indicates this bias.

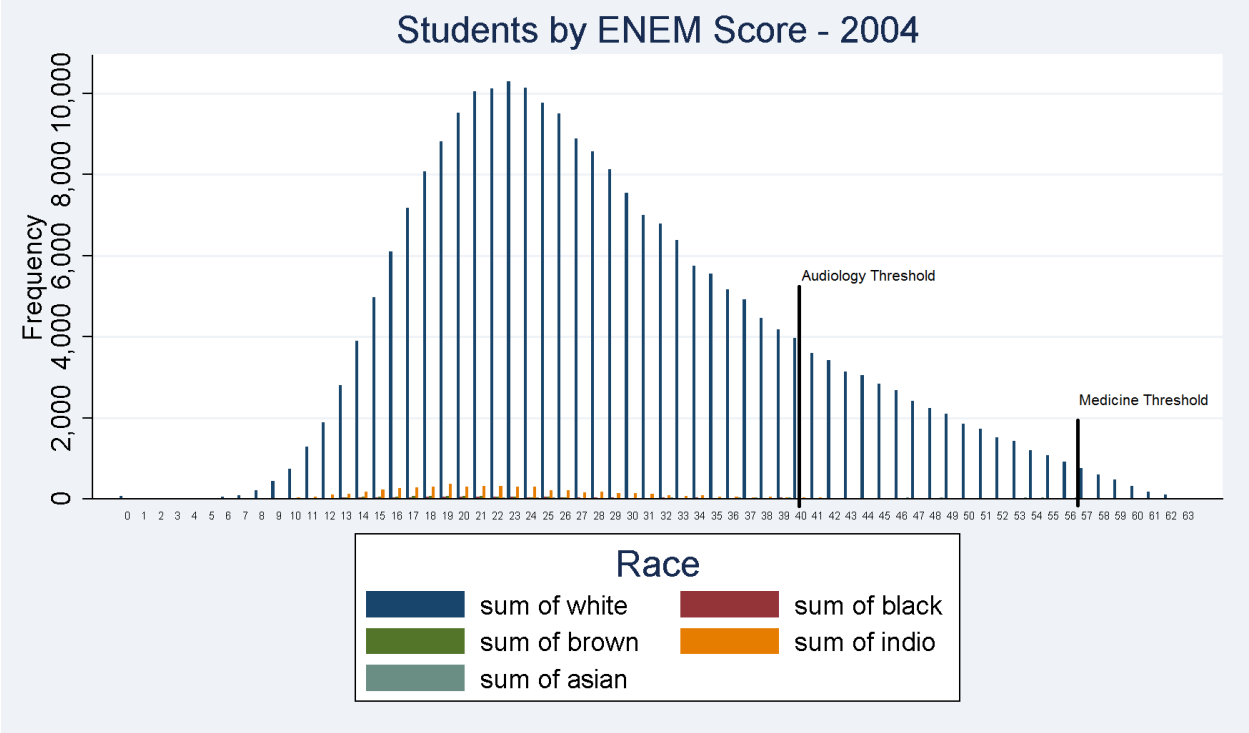

Figure 5.5. ENEM Score Distribution by Race

The lowest ENEM score in 2004, was in Audiology major at Bauru campus. Thus, every student who made an ENEM score ≥ 40.93 was assigned a binary variable, $pfonob$, to indicate that s/he would have exceeded the threshold for acceptance in this particular major. Because this was the major with the lowest ENEM score, this student would only have passed at USP if s/he had chosen this major. The highest ENEM scores were found in the Medicine major and the students who were accepted scored ≥ 56.89. A binary variable, $pmed$, was also created for students who would have exceeded the threshold grade for Medicine. Looking at the average score of all students accepted into USP, a student would have had to score ≥ 49.59 on average to be accepted in 2004. A binary variable, $pavg$, was created to indicate students who would have met this criteria.

The logit regression estimates can be found at Appendix D.16 and the percent change in odds can be found in Tables 5.34, 5.35, and 5.36.

Table 5.32. Race vs. Acceptance in Medicine USP - 2004

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	2,449	19	1	13	49	2,531
	96.76%	**0.75%**	**0.04%**	**0.51%**	**1.94%**	100%
No	238,589	1,204	1,027	5,371	986	247,177
	96.53%	0.49%	0.42%	2.17%	0.40%	100%
Total	241,038	1,223	1,028	5,384	1,035	249,708
	96.53%	**0.49%**	**0.41%**	**2.16%**	**0.41%**	100%

Table 5.33. Race vs. Acceptance in Audiology USP - 2004

Accepted	**White**	**Black**	**Brown**	**Indigenous**	**Asian**	**Total**
Yes	37,656	193	26	195	429	38,499
	97.81%	**0.50%**	**0.07%**	**0.51%**	**1.11%**	100%
No	203,382	1,030	1,002	5,189	606	211,209
	96.29%	0.49%	0.47 %	2.46%	0.29%	100%
Total	241,038	1,223	1,028	5,384	1,035	249,708
	96.53%	**0.49%**	**0.41%**	**2.16%**	**0.41%**	100%

Although there is an under reporting of blacks and browns in 2004, the results still show great disparity among racial groups. Looking at the most competitive major, which is Medicine, only one brown student would have been admitted out of 1,027 students and only 19 black students out of 1,204 students. Indigenous students also are at a major disadvantage: only 13 out of 5,284 (.51%) would have been admitted. As a result, on my analysis for Medicine, the variables blacks, brown and indigenous are not statistically significant. See Tables 5.32 and 5.33.

When looking at the average score, *pavg*, the most significant variables are public school, prep course, female, Asian and mother education.

Table 5.34. Logit: Percentage Change in Odds (2004 Passing Avg. Score - Full Model)

Odds of: yes vs no

Variables ($pavg$)	b	z	$P > \|z\|$	%	$\%Stdx$	$SDofx$
Black	0.42351	3.223	0.001	52.7	3.0	0.0698
Brown	-0.32831	-0.920	0.357	-28.0	-2.1	0.0640
Indigenous	-0.25772	-1.905	0.057	-22.7	-3.7	0.1452
Asian	1.30128	14.758	0.000	267.4	8.7	0.0642
Victim	0.08731	2.593	0.010	9.1	2.8	0.3151
Racist	0.00315	0.066	0.947	0.3	0.1	0.1857
Female	-0.98350	-48.112	0.000	-62.6	-38.3	0.4902
Age	-0.13380	-10.743	0.000	-12.5	-16.5	1.3513
Public school	-1.77689	-62.711	0.000	-83.1	-54.2	0.4399
Prep course	0.75538	29.835	0.000	112.8	26.5	0.3109
Income	0.35240	37.853	0.000	42.2	55.3	1.2498
Mother Education						
High school graduate	0.18322	6.270	0.000	20.1	7.7	0.4071
Some college	0.43965	11.273	0.000	55.2	9.8	0.2125
College graduate	0.64845	24.526	0.000	91.3	25.8	0.3539
Unknown	-0.61877	-5.578	0.000	-46.1	-9.0	0.1521

$N = 249708$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

Looking at Asians in Table 5.33 out of 1,035 Asian students 429 would have passed, about 42 percent. Thus, the odds of passing in Audiology increased by 195.3 percent for Asian students, holding everything else constant.

Studying at a public school has the opposite effect. It lowers the odds by 79.1 percent, while attending a prep course increases the odds by 96.4 percent.

Female students have the odds lowered by 55.3 percent on average compared to male students.

As in the other analyses, mother's education is very significant. The higher the mother's education, the higher the odds of being accepted.

Table 5.35. Logit: Percentage Change in Odds (2004 Passing Medicine - Full Model)

Odds of: yes vs no

Variables (*pmed*)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	0.43814	1.810	0.070	55.0	3.1	0.0698
Brown	-0.92404	-0.908	0.364	-60.3	-5.7	0.0640
Indigenous	-0.04842	-0.170	0.865	-4.7	-0.7	0.1452
Asian	0.89362	5.673	0.000	144.4	5.9	0.0642
Victim	0.12036	1.764	0.078	12.8	3.9	0.3151
Racist	0.04882	0.527	0.598	5.0	0.9	0.1857
Female	-1.13865	-25.424	0.000	-68.0	-42.8	0.4902
Age	-0.05634	-2.193	0.028	-5.5	-7.3	1.3513
Public school	-2.09056	-29.523	0.000	-87.6	-60.1	0.4399
Prep course	0.78224	16.190	0.000	118.6	27.5	0.3109
Income	0.38548	20.334	0.000	47.0	61.9	1.2498
Mother Education						
High school graduate	-0.00392	-0.059	0.953	-0.4	-0.2	0.4071
Some college	0.46753	5.952	0.000	59.6	10.4	0.2125
College graduate	0.56802	10.383	0.000	76.5	22.3	0.3539
Unknown	-0.90189	-3.187	0.001	-59.4	-12.8	0.1521

$N = 249708$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

The results for students who would have passed in Medicine show that mother's education loses statistical significance for high school graduates. However, having a mother with some college increases the odds by 59.6 percent and with a college degree increases the odds by 76.5 percent. The odds of being accepted are increased by 144.4 percent for Asian students while, the odds of passing in Medicine are lowered by 68 percent for female students, holding everything else constant. Studying in a public school lowers the odds by 87.6 percent on average, while taking a prep course increases the odds by 118.6 percent, holding everything else constant. An increase in the income category, increases the odds of passing in Medicine by 47 percent.

Table 5.36. Logit: Percentage Change in Odds (2004 Passing Audiology - Full Model)

Odds of: yes vs no

Variables ($pfonob$)	b	z	$P>\|z\|$	%	$\%Stdx$	$SDofx$
Black	0.28876	2.999	0.003	33.5	2.0	0.0698
Brown	-0.61309	-2.858	0.004	-45.8	-3.8	0.0640
Indigenous	-0.50745	-6.474	0.000	-39.8	-7.1	0.1452
Asian	1.08303	14.295	0.000	195.4	7.2	0.0642
Victim	0.06215	2.875	0.004	6.4	2.0	0.3151
Racist	0.00898	0.278	0.781	0.9	0.2	0.1857
Female	-0.80573	-62.128	0.000	-55.3	-32.6	0.4902
Age	-0.18054	-23.683	0.000	-16.5	-21.6	1.3513
Public school	-1.56365	-99.002	0.000	-79.1	-49.7	0.4399
Prep course	0.67522	37.522	0.000	96.4	23.4	0.3109
Income	0.33218	53.941	0.000	39.4	51.5	1.2498
Mother Education						
High school graduate	0.34218	20.240	0.000	40.8	14.9	0.4071
Some college	0.56834	22.258	0.000	76.5	12.8	0.2125
College graduate	0.71432	41.024	0.000	104.3	28.8	0.3539
Unknown	-0.42360	-7.255	0.000	-34.5	-6.2	0.1521

$N = 249708$

b = raw coefficient

z = z-score fore test of $b = 0$

$P > z$ = p-value for z-test

% = percentage change in odds for unit increase in X

$\%StdX$ = percentage change in odds for SD increase in X

$SDofX$ = standard deviation of X

Because of the race reporting problem mentioned in the beginning of this section, when analyzing the lowest category for Audiology, the variable *black* appears to be positive and significant. The reason is that although only .50% of students accepted would have been black, this percentage is higher than the total population of blacks .49%. The fact that only 1,223 students claimed to be black adversely affected the results. Thus, one should be cautious in drawing conclusions, since it is clear that there is still a big disparity among races as illustrated by Table 5.33.

Nevertheless, one of the most significant variables in this analysis is public school. The odds of being accepted are lowered by 79.1 percent for students who studied at public high schools while taking a prep course increases the odds by 96.4 percent. Income is also significant, one increase in the income category increases the odds by 39.4 percent.

There is a clear relationship between mother's education and acceptance in Audiology. The higher the mother's education, the higher the odds of passing in this particular major. While having a mother with high school degree increases the odds by 40.8 percent, having a mother with college degree increases the odds by 104.3 percent on average, holding everything else constant.

Victim and *Racist* Variables

Examining the results of the tables in the previous sections, one surprising finding is that being a victim of racial discrimination was a positive and significant predictor of passing at the University of São Paulo for most years and categories. Only in 2006 and 2008 under *pmed* the coefficient *victim* is negative, statistical insignificance. This is opposite to the expected effect. In other words, students who were victimized were more likely to be accepted into the University of São Paulo.

Multicollinearity was suspected and several tests were run to check whether or not this was the case. I ran vif and collin tests for all years of the dataset, and the results were well

below the threshold that would indicate multicollinearity. See Appendix D.2 and D.4. The only two variables that were slightly more correlated than others were income and mother's education. Thus, I re-ran the model using only one of those variables at a time to see if there would be any change, but in both cases my variables did not change signs and only became slightly more significant. Hence, I kept both variables in my full model.

No multicollinearity was detected and although intuition would make us expect that victimization would have a negative and significant effect, we find the opposite result. This apparently strangle result can be explained in several ways. It may be that although a student was discriminated against because of his/her color, this motivated the student to study hard to prove that they could accomplish something great in life, such as being admitted to USP, a highly prestigious university. Such students became resilient and persevered despite suffering discrimination. Or alternatively, the reason why the student was discriminated against could have been because s/he was actually considered by peers to be intelligent (a nerd) making him/her targets for different forms of discrimination. Likewise, as indicated in Figure 3.5 in Chapter 3, the most wealthier students also reported being victims of racial discrimination. Thus, the reason why a student is targeted maybe be more complex than anticipated.

The variable *racist*, was not statistically significant in any of the models in 2008, 2006 and 2004. In the year 2007, it was only significant under Natural Sciences. The result indicated that being a racist lowers the odds of being accepted in Natural Sciences by 20.6 percent. Also in the year 2005, it was significant under Audiology, indicating that the odds of being accepted in this category is lowered by 10 percent. However, since in most occurrences it was not significant, this could be a random occurrence of significance when variable is in fact not significant.

5.4 Summary

Based on the results above, I can reject the null hypothesis that there is no relationship between type of high school and *vestibular* acceptance. For all years analyzed, being from a public school had a significant negative impact on being admitted to the University of São Paulo. Furthermore, I can also reject the null hypothesis that there is no relationship between race and *vestibular* acceptance. For all years it was clear that there was a huge disparity between acceptance and racial groups. Black, brown and indigenous students on average scored much lower than whites and Asian students, thus reducing their odds of being accepted to USP. Refer to Table 5.37 to see the percentage change in odds for all years and variables.

Based on the results described in the previous sections, I also can conclude that among the other socio-demographics that negatively influence acceptance at the University of São Paulo are the age of the student and being a woman. The mother's educational level and income are also strong determinants of acceptance, due to the fact that they are correlated with the level of resources available to be spent in education, including the ability to afford private education or a prep course.

These differentials mean that compared with all students seeking university education in Brazil, those accepted by the University of São Paulo are more likely to be white, to come from high income families, to come from private high schools, to enroll in *cursinho* (*vestibular* prep course) and to have a mother with high educational attainment.

These conclusions do have limitations. A proxy for acceptance was used. Whether or not a student actually took the *vestibular* exam at USP and was admitted is hard to determine for sure, since this data is not available at this time to draw direct inference. As a result, even though a student might have taken the ENEM exam, s/he may not have taken the USP *vestibular* and hence should not have been considered in the analysis. Also, the University

of São Paulo is the best university of Latin America, thus the characteristics of students admitted at this university might be very different than students admitted at another public university such as the *Universidade Estadual Paulista* (UNESP). With respect to women the ENEM score analyzed corresponded to the objective part of the exam and many studies have shown that women tend to perform worse than men on objective exams. Although the ENEM exam has a essay part, because the grading is subjective to the person grading the exam, this was not included in the analysis. Women comprise of 56 percent of undergraduate students enrolled in Brazilian higher education institutions and the predominance of women among students in higher education seems to be a lasting trend [Tomelin, 2002].

Although the analysis compares the score of students who took the ENEM exam with those accepted at USP, based on data provided by FUVEST I find that my results are very consistent with the fuller dataset. The racial differentials found in this study are similar to the actual racial distribution of students who were admitted to the University of São Paulo as indicated in Table 5.38 for all majors and on Table 5.39 where only the Medicine major percentages are shown. Likewise, looking at type of school, the results found in this study are similar to the actual distribution of type of school for students who were admitted to the University of São Paulo as indicated in Table 5.40 for all majors and on Table 5.41 where only the Medicine major percentages are shown.

Table 5.37. Logit: Percentage Change in Odds (2008-2004 Full Models)

Odds of: yes vs. no

Variables	% 2008		% 2007		% 2006		% 2005		% 2004	
	Medicine	Nat. Science	Medicine	Nat. Science	Medicine	Nat. Science	Medicine	Audiology	Medicine	Audiology
Black	-35.8*	-35.6***	-35.7***	-29.1***	-48.6*	-31.7***	5.9	-26.6***	55.0	33.5**
Brown	-89.9*	-52.5***	-57.0***	-39.1***		-53.8***		-38.7***	-60.3	-45.8**
Indigenous	26.1	-59.6***	-5.8	-49.4***		-47.3***	96.5	-43.3***	-4.7	-39.8***
Asian	85.7***	38.9***	39.4***	-14.1***	113.3***	34.0***	76.2**	-1.2	144.4***	195.4***
Victim	-2.6	21.8***	18.2***	16.2***	-6.7	22.4***	6.3	18.7***	12.8	6.4**
Racist	-6.3	-3.6	9.6	-20.6***	24.1	-2.4	20.7	-10.0***	5.0	0.9
Female	-63.2***	-46.4***	-57.1***	-24.9***	-74.9***	-57.9***	-69.2***	-31.6***	-68.0***	-55.3***
Age	23.5***	-3.5***	-11.9***	-7.3***	-0.4	-16.9***	-7.1	-13.8***	-5.5*	-16.5***
Public school	-85.6***	-74.2***	-80.8***	-80.3***	-95.9***	-80.1***	-95.0***	-78.5***	-87.6***	-79.1***
Prep course	79.2***	134.1***	107.3***	34.1***	41.7*	104.5***	86.0***	48.3***	118.6***	96.4***
Income	65.7***	52.7***	52.3***	40.7***	58.6***	46.2***	64.7***	35.3***	47.0***	39.4***
Mother Education										
High school graduate	-35.1*	31.4***	12.3***	43.0***	-22.6	36.7***	-28.8	48.5***	-0.4	40.8***
Some college	-13.1	68.3***	31.4***	73.6***	8.5	66.1***	25.2	96.8***	59.6***	76.5***
College graduate	34.7*	79.7***	61.9***	71.4***	57.0**	88.7***	56.9**	106.0***	76.5***	104.3***
Unknown	-80.6	-27.6***	-48.8***	-28.7***	-4.9	-38.2***		-37.8***	-59.4**	-34.5***
N=	300870	300870	256684	256684	282653	282653	268294	268294	249708	249708

% = percentage change in odds for unit increase in X

$*p < 0.05, **p < 0.01, ***p < 0.001$

Table 5.38. All Majors Acceptance by Race at USP 2008-2004

Race	**2008**	**2007**	**2006**	**2005**	**2004**
White	8,683 (77.7%)	8,743 (77.2%)	8,866 (77.4%)	8,565 (77.1%)	8,064 (79.8%)
Black	220 (2.0%)	217 (1.9%)	180 (1.6%)	175 (1.6%)	162 (1.6%)
Asian	1,024 (9.2%)	1,137 (10%)	1,209 (10.6%)	1,176 (10.6%)	993 (9.8%)
Brown	1,219 (10.9%)	1,193 (10.5%)	1,154 (10.1%)	1,162 (10.5%)	864 (8.5%)
Indigenous	26 (0.2%)	42 (0.4%)	40 (0.3%)	37 (0.3%)	27 (27%)
Total	11,172*	11,332*	11,449*	11,115*	10,110*

*The response rate for this question was 99.0% for all years.
Source: [Fuvest, 2004-2008]

Table 5.39. Medicine Acceptance by Race at USP 2008-2004

Race	**2008**	**2007**	**2006**	**2005**	**2004**
White	276 (76.2%)	281 (78.3%)	289 (77.1%)	285 (75.8%)	292 (78.3%)
Black	1 (0.3%)	5 (1.4%)	1 (0.3%)	2 (0.5%)	0 (0.0%)
Asian	64 (17.7%)	49 (13.6%)	60 (16.0%)	61 (16.2%)	57 (15.3%)
Brown	19 (5.2%)	23 (6.4%)	23 (6.1%)	27 (7.2%)	24 (6.4%)
Indigenous	2 (0.6%)	1 (0.3%)	2 (0.5%)	1 (0.3%)	0 (0.0%)
Total	362*	359*	375*	376*	373*

*This represents roughly 99% of students accepted into this major.
Source: [Fuvest, 2004-2008]

Table 5.40. All Majors Acceptance by Type of School at USP 2008-2004

Type of School	**2008**	**2007**	**2006**	**2005**	**2004**
Private	7,823 (69.7%)	8,029 (70.6%)	8,313 (72.2%)	7,878 (70.6%)	7,261 (71.6%)
Public	2,757 (24.6%)	2,806 (24.7%)	2,559 (22.2%)	2,687 (24.1%)	2,297 (22.6%)
Abroad	64 (0.6%)	23 (0.2%)	16 (0.1%)	18 (0.2%)	21 (0.2%)
Mostly Private	340 (3.0%)	291 (2.6%)	304 (2.6%)	276 (2.5%)	301 (3.0%)
Mostly Public	194 (1.7%)	172 (1.5%)	216 (1.9%)	201 (1.8%)	179 (1.8%)
Other	46 (0.4%)	56 (0.5%)	111 (1.0%)	100 (0.9%)	87 (0.9%)
Total	11,224*	11,377*	11,519*	11,160*	10,146*

*The response rate for this question was 99.0% for all years.
Source: [Fuvest, 2004-2008]

Table 5.41. Medicine Acceptance by Type of School at USP 2008-2004

Type of School	**2008**	**2007**	**2006**	**2005**	**2004**
Private	325 (88.8%)	316 (86.8%)	340 (90.9%)	355 (93.9%)	346 (92.5%)
Public	22 (6.0%)	42 (11.5%)	18 (4.8%)	17 (4.5%)	18 (4.8%)
Abroad	1 (0.3%)	0 (0%)	1 (0.3%)	0 (0%)	0 (0%)
Mostly Private	15 (4.1%)	4 (1.1%)	11 (2.9%)	3 (0.8%)	7 (1.9%)
Mostly Public	3 (0.8%)	2 (0.5%)	4 (1.1%)	3 (0.8%)	2 (0.5%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.3%)
Total	366*	364*	374*	378 *	374*

*This represents roughly 99.5% of students accepted into this major.
Source: [Fuvest, 2004-2008]

CHAPTER 6

CONCLUSIONS

> Affirmative actions are defined as public policies directed to fulfil the constitutional principles of material equality and to neutralize the perversive effects of discrimination of race, gender, age, or origin. These measures aim to fight not only flagrant manifestations of discrimination, but *de facto* discrimination, that is so absolutely rooted in our society, so well rooted, that [most] people do not perceive it.
>
> –Joaquim Barbosa, Justice of the Brazilian Supreme Court[Barbosa, 2012]

The main argument against affirmative action in Brazil today is that it will divide Brazilian society into racial groups and people will no longer be Brazilians, but whites, blacks, browns, yellows (Asians), reds (indigenous) and so forth. Despite the rhetoric that Brazil is a racial democracy, statistics show that these divisions exist and racial discrimination is alive and well. This study analyzed not only students who claimed to have been discriminated because of their race, but also looked at racial groups. It became clear that in both instances, non-white students were at a much bigger disadvantage in comparison to white students. Racial disparity exists in the Brazilian educational system and is a major contributor to persistent inequality.

6.1 Main Conclusions

The principal conclusions drawn from these analyses are:

- Victims of racial discrimination are more likely to assign a lower score to the quality of their education, and more likely to score in lower categories of the ENEM exam.
- Students who claimed to be racists had even lower scores on the ENEM exam and gave an even lower score for quality of education than victims of racism. It should come as

no surprise, since someone who claims to be a racist probably did not receive a good education to start with.

- Non-white students have a lower ENEM score than white students. There are some disturbing racial disparities that became evident in the comparison case of the University of São Paulo. Black and brown students are not only at a disadvantage for being victimized in school and experiencing a poor learning environment, but also were at disadvantage when trying to go to a good public university such as USP.

- Although female students were more likely to give a higher ranking for the quality of education they experienced, they tended to score in lower categories of the ENEM exam compared to male students. To be fair, only the objective part of the exam was used in this study. Further analysis looking at both the essay and objective part of the ENEM exam is necessary, since females tend to do much better on essay exams than male students and are the majority group in higher education in Brazil.

- Parents' education plays a key role in the student's performance, particularly that of the mother. The more educated the student's parents are, the more likely the student is to rank quality of education in a higher category and to score higher in the ENEM exam. Income has the same influence. The main reason is the fact that parents' education and income are highly correlated, and this results in more resources being available to the student for educational purposes. Hence, the student will experience a better quality of education, will score higher on the ENEM exam and will greatly increase his or her odds of passing the *vestibular* at a good public university like USP.

Based on these conclusions, it becomes clear that higher education in Brazil is synonymous with elitism and that the lack of accessibility to the general population is an impediment to social mobility. Although, at a first glance the *vestibular* may seem like the main reason,

it is only part of the problem. The magnitude of the demand for higher education vis-à-vis supply is not being met and creates an additional problem. As in the case of the University of São Paulo, in November 2012, 159,000 people registered for the *vestibular*, only 10,982 students will be selected at the USP campus and an additional 100 students for the major of Medicine at the Medical School at Santa Casa São Paulo [USP, 2012]. Thus, it is imperative that the government also allocates more resources to public universities in order to help them grow and build more institutions of higher education to meet the growing demand of students, specially poor minorities.

The Brazilian Constitution of 1988 states that every Brazilian has the right to receive free education of good quality. Unfortunately, the free education that is available in high schools is of poor quality and does not met the rigorous requirements of public higher institutions. Based on the results in Chapter 5, going to a public school reduces the odds of being accepted in the most competitive degree of Medicine by a average of 88.98 percent at USP and in one of the least competitive majors of Nature Sciences/Audiology by 78.44 percent. Thus, policies to improve the quality and curriculum of public high schools are urgent since it will ensure that poor family will have the incentive, condition and satisfactory welfare to send their children to public school knowing that public college will be accessible in the future.

In addition, as the results suggest, affirmative action and quotas for students coming from public high schools and for black, brown and indigenous groups should be implemented to reduce the racial disparity observed and described above. The fact that no brown or indigenous student would have been able to be accepted in Medicine in 2005 and 2006, for example, is absurd. It is essential that the Brazilian government continue to address this issue by creating more policies to promote access to higher education for under represented racial groups and create new institutions of higher education.

Racial discrimination affects high school performance and college admission in Brazil. It affects the overall quality of the high school learning environment, and there is evidence

that racial discrimination decreases scores achieved in the ENEM exam. Most importantly, racial discrimination has an impact on college admission as shown by the disparities among racial groups. Policies to improve awareness of racial bullying and to punish perpetrators of racial discrimination at all levels of the educational system will be beneficial to create a safe and fair learning environment, while educating the next generation of Brazilians important concepts of equality and fairness. In order to become a true racial democracy, Brazilians have to acknowledge that racism exists. Because racism is a detrimental factor to a multiracial society as Brazil, it needs to be a priority that is addressed seriously.

These findings are robust, confirmed by using multiple specifications and sub-samples, and most of the coefficients were significant at the .001 level.

6.2 Future Research

There seems to be great potential for future research on affirmative action and its effects in Brazil. As this dissertation was being written, President Dilma Rousseff approved and signed into law, on August 29, 2012, an affirmative action measure that reserves 50% of slots in federal universities to students from public high schools [de S. Paulo, 2012]. The selection of students within this quota system will be determined by their score on the ENEM exam. Within this quota, half of the slots will be allocated to students whose family income is lower or equal to 1.5 minimum wage per person in the household [de S. Paulo, 2012], and within this quota, slots will be reserved for blacks, browns and indigenous people in proportion to the percentage of these groups within the state where the university is located [de S. Paulo, 2012]. In the state of São Paulo, for example, approximately 30% of the population is black, brown or indigenous, whereas in Bahia this number is close to 70%. According to this new law, if the quota slots are not filled by the specified racial groups, then the available slots should go to students who studied only in public high school.

This law will be in effect in 2013, although federal universities have four years to implement the necessary changes. The challenge is considerable. Only 25 federal universities had a system in place before this law to give bonuses on their *vestibular* to black, brown and indigenous students [da Globo, 2012] and currently, out of 59 federal universities, 27 have not implemented this new affirmative action measure.

State universities, such as the University of São Paulo and private universities were not affected and can choose whether or not to adopt a form of affirmative action. Although USP, Unicamp and many public state universities have some sort of bonuses for students coming from public schools, they have not implemented affirmative action. But, as this dissertation is being written, USP has started to discuss for the first time the possibility of adopting affirmative action. The results in Chapter 5 indicate that this will be an essential and beneficial policy since non-white students have, on average, a very low probability of being accepted into USP. In fact, a recent news article in the *Folha* newspaper, stated that the University of São Paulo has more African students than Afro-Brazilian students and that the only black professor in the whole university who also was African, has retired [Bergamim, 2012]. In a society as diverse as Brazil, this is disturbing news. Thus, if approved by USP, the new policy will be a significant step towards equality and diversity. This could possibly be the start of the *enegrecimento* (blackening) of the Brazilian race, as more and more Afro-descendants who used to say that they were "whites" embrace their roots and become mixed or black because it is less likely to be a barrier to university admission. As discussed before, many Afro-Brazilians claim to be white because they accepted the ideal of whitening and the myth of racial democracy, believing that a lighter complexion and more European facial features were superior. [Skidmore and Smith, 1997]. Now, there could be a move reversing these previous notions that will result in Afro-Brazilians being proud of their ancestry and history.

6.3 Concluding Remarks

In a society as multiracial as Brazil, racial discrimination should be addressed with the goal of creating a safe environment for all groups of students and bringing awareness of prejudice and violence not only to the school campus, but to the Brazilian society as a whole. Affirmative action needs to be discussed and taken seriously if Brazil is to become a racial democracy. The key to social mobility is education. How can Brazilians claim that Brazil is a racial democracy and race should not be discussed, while the majority of Afro-descendants are not able to have access to higher education? The reality, unfortunately, is much farther from the rhetoric than we would like to admit. Although Brazil is a growing economy, the inequality gap has widened in recent years. The main reason is that blacks and browns people are being left behind. In order to close this gap, higher education needs to be free and available to all Brazilians without distinction of racial group or socio-economic status.

In light of these governmental changes, as this new affirmative action law is implemented, there will be great opportunity for future research. What will be the effects of affirmative action in Brazil? Will quota students be able to keep up their grades in comparison with students who entered without quotas? Will Brazil go through an *enegrecimento* (blackening) as more Afro-descendants start to identify as black in order to benefit from the quota system? Will affirmative action level previous disparities observed among racial groups at USP?

As these questions indicate there are many more hypotheses to be tested. Thus, this is an interesting field of study with many opportunities for research that can have a direct impact in helping Brazil reach its goal of becoming a democracy with equal opportunity for every citizen. Brazil seems to be making great strides with these recent changes, it remains to be seen if one day all students will have a fair opportunity of attending the university of their choice regardless of their socio-economic background and color.

APPENDIX A

BRAZILIAN STATES

Table A.1. Brazilian States

State Name	**State Abbreviation**
Acre	(AC)
Alagoas	(AL)
Amapá	(AP)
Amazonas	(AM)
Bahia	(BA)
Ceará	(CE)
Distrito Federal	(DF)
Espírito Santo	(ES)
Goiás	(GO)
Maranhão	(MA)
Mato Grosso	(MT)
Mato Grosso do Sul	(MS)
Minas Gerais	(MG)
Pará	(PA)
Paraíba	(PB)
Paraná	(PR)
Pernambuco	(PE)
Piauí	(PI)
Rio de Janeiro	(RJ)
Rio Grande do Norte	(RN)
Rio Grande do Sul	(RS)
Rondônia	(RO)
Roraima	(RR)
Santa Catarina	(SC)
São Paulo	(SP)
Sergipe	(SE)
Tocantins	(TO)

APPENDIX B

BRAZILIAN MAP

Figure B.1. Brazil' Five Macro-Regions

Figure extrated from `http://commons.wikimedia.org/wiki/File:States_and_Great_Regions_in_Brazil.png`.

APPENDIX C

STUDENTS DISTRIBUTION BY BRAZILIAN STATES

Table C.1. Number of Students by Brazilian States

State Name	**State Abbreviation**	**Freq.**	**Percent**	**Cum.**
Acre	(AC)	6,665	0.27	0.27
Alagoas	(AL)	18,600	0.75	1.01
Amazonas	(AM)	31,474	1.26	2.28
Amapá	(AP)	8,943	0.36	2.64
Bahia	(BA)	175,321	7.04	9.68
Ceará	(CE)	79,665	3.20	12.88
Distrito Federal	(DF)	23,277	0.94	13.82
Espírito Santo	(ES)	52,020	2.09	15.91
Goiás	(GO)	79,638	3.20	19.10
Maranhão	(MA)	30,616	1.23	20.33
Minas Gerais	(MG)	270,374	10.86	31.19
Mato Grosso do Sul	(MS)	40,156	1.61	32.81
Mato Grosso	(MT)	49,097	1.97	34.78
Pará	(PA)	67,196	2.70	37.48
Paraíba	(PB)	23,914	0.96	38.44
Pernambuco	(PE)	89,354	3.59	42.03
Piauí	(PI)	33,875	1.36	43.39
Paraná	(PR)	176,089	7.07	50.46
Rio de Janeiro	(RJ)	183,811	7.38	57.85
Rio Grande do Norte	(RN)	34,813	1.40	59.24
Rondônia	(RO)	25,250	1.01	60.26
Roraima	(RR)	6,556	0.26	60.52
Rio Grande do Sul	(RS)	120,045	4.82	65.34
Santa Catarina	(SC)	71,445	2.87	68.21
Sergipe	(SE)	16,387	0.66	68.87
São Paulo	(SP)	752,153	30.21	99.09
Tocantins	(TO)	22,775	0.91	100.00
Total		2,489,509	100.00	

APPENDIX D

COLLINEARITY AND LOGIT OUTPUTS

Table D.1. Collinearity Diagnostics for Model 1 and Model 2

Variables	**VIF**	**SQRT VIF**	**Tolerance**	**R-Squared**
victim	1.10	1.05	0.9068	0.0932
witness	1.09	1.04	0.9194	0.0806
racist	1.02	1.01	0.9822	0.0178
racistenv	1.08	1.04	0.9235	0.0765
non_white	1.29	1.14	0.7724	0.2276
female	1.05	1.02	0.9530	0.0470
age	1.91	1.38	0.5240	0.4760
income	1.46	1.21	0.6854	0.3146
publicschool	1.33	1.15	0.7543	0.2457
prepcourse	1.03	1.01	0.9735	0.0265
father_hsg	1.20	1.09	0.8353	0.1647
father_coll	1.09	1.04	0.9178	0.0822
father_bach	1.27	1.13	0.7894	0.2106
father_miss	1.19	1.09	0.8431	0.1569
mother_hsg	1.19	1.09	0.8383	0.1617
mother_coll	1.08	1.04	0.9237	0.0763
mother_bach	1.26	1.12	0.7914	0.2086
mother_miss	1.16	1.08	0.8605	0.1395
married	1.72	1.31	0.5822	0.4178
children	2.06	1.44	0.4855	0.5145
work	1.06	1.03	0.9469	0.0531
southeast	1.06	1.03	0.9418	0.0582
urban	1.01	1.00	0.9907	0.0093
favela	1.04	1.02	0.9642	0.0358
*y*2004	1.65	1.29	0.6050	0.3950
*y*2005	1.56	1.25	0.6407	0.3593
*y*2006	1.52	1.23	0.6578	0.3422
*y*2007	1.52	1.23	0.6596	0.3404
Mean VIF	1.29			

(obs=2489509)

Table D.2. Collinearity Diagnostics for Chapter 5 - Year 2008

Variables	**VIF**	**SQRT VIF**	**Tolerance**	**R-Squared**
black	1.15	1.07	0.8693	0.1307
brown	1.19	1.09	0.8437	0.1563
indio	1.01	1.00	0.9917	0.0083
asian	1.04	1.02	0.9614	0.0386
victim	1.15	1.07	0.8697	0.1303
racist	1.01	1.00	0.9947	0.0053
$female$	1.02	1.01	0.9835	0.0165
age	1.10	1.05	0.9115	0.0885
publicschool	1.73	1.31	0.5786	0.4214
prepcourse	1.03	1.01	0.9708	0.0292
income	1.66	1.29	0.6014	0.3986
mother_hsg	1.16	1.08	0.8607	0.1393
mother_coll	1.10	1.05	0.9123	0.0877
mother_bach	1.45	1.21	0.6876	0.3124
mother_miss	1.02	1.01	0.9756	0.0244
Mean VIF	1.19			

(obs=300870)

Table D.3. Collinearity Diagnostics for Chapter 5 - Year 2008

	Eigenval	**Cond Index**
1	5.2717	1.0000
2	1.2417	2.0605
3	1.1645	2.1276
4	1.0150	2.2790
5	1.0001	2.2959
6	0.9933	2.3038
7	0.9639	2.3386
8	0.9420	2.3656
9	0.8422	2.5019
10	0.7761	2.6063
11	0.5805	3.0136
12	0.4538	3.4082
13	0.3586	3.8340
14	0.2008	5.1244
15	0.1717	5.5417
16	0.0241	14.7975

(obs=300870)

Condition Number: 14.7975

Eigenvalues and Cond Index computed from scaled raw sscp (w/ intercept)

Det(correlation matrix): 0.2839

Table D.4. Collinearity Diagnostics for Chapter 5 - Year 2007

Variables	**VIF**	**SQRT VIF**	**Tolerance**	**R-Squared**
black	1.15	1.07	0.8702	0.1298
brown	1.20	1.09	0.8365	0.1635
indio	1.01	1.00	0.9915	0.0085
asian	1.03	1.02	0.9665	0.0335
victim	1.15	1.07	0.8710	0.1290
racist	1.00	1.00	0.9957	0.0043
$female$	1.02	1.01	0.9836	0.0164
age	1.12	1.06	0.8954	0.1046
publicschool	1.67	1.29	0.6000	0.4000
prepcourse	1.02	1.01	0.9819	0.0181
income	1.63	1.28	0.6149	0.3851
mother_hsg	1.15	1.07	0.8661	0.1339
mother_coll	1.09	1.05	0.9147	0.0853
mother_bach	1.43	1.19	0.7010	0.2990
mother_miss	1.02	1.01	0.9791	0.0209
Mean VIF	1.18			

(obs=256684)

Table D.5. Collinearity Diagnostics for Chapter 5 - Year 2007

	Eigenval	**Cond Index**
1	5.2488	1.0000
2	1.2147	2.0788
3	1.1504	2.1360
4	1.0170	2.2718
5	1.0006	2.2903
6	0.9936	2.2984
7	0.9658	2.3312
8	0.9493	2.3514
9	0.8686	2.4582
10	0.7866	2.5832
11	0.6065	2.9418
12	0.4548	3.3973
13	0.3558	3.8410
14	0.1887	5.2735
15	0.1755	5.4690
16	0.0233	15.0192

(obs=256684)

Condition Number: 15.0192

Eigenvalues and Cond Index computed from scaled raw sscp (w/ intercept)

Det(correlation matrix): 0.2979

Table D.6. Collinearity Diagnostics for Chapter 5 - Year 2006

Variables	**VIF**	**SQRT VIF**	**Tolerance**	**R-Squared**
black	1.14	1.07	0.8754	0.1246
brown	1.20	1.10	0.8337	0.1663
indio	1.01	1.01	0.9899	0.0101
asian	1.04	1.02	0.9662	0.0338
victim	1.15	1.07	0.8687	0.1313
racist	1.00	1.00	0.9960	0.0040
female	1.02	1.01	0.9845	0.0155
age	1.11	1.05	0.9009	0.0991
publicschool	1.66	1.29	0.6023	0.3977
prepcourse	1.01	1.01	0.9885	0.0115
income	1.61	1.27	0.6207	0.3793
mother_hsg	1.14	1.07	0.8751	0.1249
mother_coll	1.08	1.04	0.9219	0.0781
mother_bach	1.42	1.19	0.7045	0.2955
mother_miss	1.02	1.01	0.9776	0.0224
Mean VIF	1.17			

(obs=282653)

Table D.7. Collinearity Diagnostics for Chapter 5 - Year 2006

	Eigenval	**Cond Index**
1	5.2391	1.0000
2	1.2084	2.0822
3	1.1434	2.1406
4	1.0120	2.2753
5	1.0008	2.2880
6	0.9967	2.2927
7	0.9593	2.3370
8	0.9504	2.3479
9	0.8816	2.4378
10	0.7925	2.5712
11	0.6149	2.9190
12	0.4571	3.3853
13	0.3519	3.8583
14	0.1924	5.2183
15	0.1760	5.4553
16	0.0236	14.8979

(obs=282653)

Condition Number: 14.8979

Eigenvalues and Cond Index computed from scaled raw sscp (w/ intercept)

Det(correlation matrix): 0.3064

Table D.8. Collinearity Diagnostics for Chapter 5 - Year 2005

Variables	**VIF**	**SQRT VIF**	**Tolerance**	**R-Squared**
black	1.15	1.07	0.8711	0.1289
brown	1.21	1.10	0.8245	0.1755
indio	1.01	1.00	0.9908	0.0092
asian	1.03	1.02	0.9686	0.0314
victim	1.17	1.08	0.8577	0.1423
racist	1.00	1.00	0.9953	0.0047
female	1.01	1.01	0.9852	0.0148
age	1.11	1.05	0.9005	0.0995
publicschool	1.66	1.29	0.6036	0.3964
prepcourse	1.01	1.01	0.9869	0.0131
income	1.59	1.26	0.6294	0.3706
mother_hsg	1.14	1.07	0.8741	0.1259
mother_coll	1.09	1.04	0.9179	0.0821
mother_bach	1.43	1.20	0.6997	0.3003
mother_miss	1.02	1.01	0.9809	0.0191
Mean VIF	1.18			

(obs=268294)

Table D.9. Collinearity Diagnostics for Chapter 5 - Year 2005

	Eigenval	**Cond Index**
1	5.2479	1.0000
2	1.2177	2.0760
3	1.1468	2.1392
4	1.0122	2.2770
5	1.0005	2.2902
6	0.9954	2.2961
7	0.9596	2.3385
8	0.9561	2.3428
9	0.8816	2.4399
10	0.7986	2.5635
11	0.6200	2.9093
12	0.4494	3.4171
13	0.3447	3.9021
14	0.1864	5.3053
15	0.1608	5.7132
16	0.0222	15.3693

(obs=268294)

Condition Number: 15.3693

Eigenvalues and Cond Index computed from scaled raw sscp (w/ intercept)

Det(correlation matrix): 0.3032

Table D.10. Collinearity Diagnostics for Chapter 5 - Year 2004

Variables	**VIF**	**SQRT VIF**	**Tolerance**	**R-Squared**
black	1.01	1.01	0.9895	0.0105
brown	1.02	1.01	0.9828	0.0172
indio	1.03	1.01	0.9726	0.0274
asian	1.00	1.00	0.9956	0.0044
victim	1.02	1.01	0.9852	0.0148
racist	1.00	1.00	0.9959	0.0041
female	1.02	1.01	0.9819	0.0181
age	1.12	1.06	0.8890	0.1110
publicschool	1.62	1.27	0.6160	0.3840
prepcourse	1.01	1.00	0.9911	0.0089
income	1.57	1.25	0.6350	0.3650
mother_hsg	1.15	1.07	0.8710	0.1290
mother_coll	1.10	1.05	0.9090	0.0910
mother_bach	1.44	1.20	0.6942	0.3058
mother_miss	1.02	1.01	0.9775	0.0225
Mean VIF	1.14			

(obs=249708)

Table D.11. Collinearity Diagnostics for Chapter 5 - Year 2004

	Eigenval	**Cond Index**
1	4.9393	1.0000
2	1.1249	2.0954
3	1.0330	2.1867
4	1.0059	2.2159
5	0.9995	2.2230
6	0.9952	2.2278
7	0.9900	2.2336
8	0.9620	2.2660
9	0.9224	2.3140
10	0.8580	2.3993
11	0.8509	2.4094
12	0.6238	2.8138
13	0.3529	3.7413
14	0.1776	5.2729
15	0.1420	5.8980
16	0.0224	14.8414

(obs=249708)

Condition Number: 14.8414

Eigenvalues and Cond Index computed from scaled raw sscp (w/ intercept)

Det(correlation matrix): 0.3843

Table D.12. Logit Regression 2008 - Chapter 5

	pavg	**pavg**	**pavg**	**pmed**	**pmed**	**pmed**	**pnsci**	**pnsci**	**pnsci**
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Black	-0.416***	-0.431***	-0.431***	-0.446*	-0.442*	-0.443*	-0.419***	-0.440***	-0.440***
	(0.0375)	(0.0378)	(0.0378)	(0.203)	(0.204)	(0.204)	(0.0155)	(0.0156)	(0.0156)
Brown	-1.028***	-1.087***	-1.087***	-2.302*	-2.290*	-2.290*	-0.658***	-0.743***	-0.744***
	(0.0957)	(0.0973)	(0.0973)	(1.004)	(1.007)	(1.007)	(0.0308)	(0.0321)	(0.0321)
Indigenous	-0.841**	-0.876**	-0.876**	0.223	0.231	0.232	-0.863***	-0.907***	-0.906***
	(0.310)	(0.310)	(0.310)	(1.006)	(1.008)	(1.008)	(0.120)	(0.121)	(0.121)
Asian	0.410***	0.370***	0.370***	0.610***	0.619***	0.619***	0.378***	0.329***	0.329***
	(0.0396)	(0.0414)	(0.0414)	(0.162)	(0.172)	(0.172)	(0.0257)	(0.0263)	(0.0263)
Female	-0.766***	-0.764***	-0.764***	-0.998***	-0.998***	-0.999***	-0.626***	-0.624***	-0.624***
	(0.0214)	(0.0214)	(0.0214)	(0.109)	(0.109)	(0.110)	(0.0109)	(0.0109)	(0.0109)
Age	0.137***	0.136***	0.136***	0.211***	0.211***	0.211***	-0.0341***	-0.0357***	-0.0357***
	(0.00823)	(0.00823)	(0.00823)	(0.0386)	(0.0386)	(0.0386)	(0.00425)	(0.00426)	(0.00426)
Public school	-1.658***	-1.658***	-1.658***	-1.935***	-1.935***	-1.935***	-1.354***	-1.355***	-1.355***
	(0.0329)	(0.0329)	(0.0329)	(0.193)	(0.193)	(0.193)	(0.0133)	(0.0133)	(0.0133)
Prep course	0.815***	0.813***	0.813***	0.583***	0.583***	0.584***	0.854***	0.850***	0.851***
	(0.0232)	(0.0232)	(0.0232)	(0.109)	(0.109)	(0.109)	(0.0140)	(0.0140)	(0.0140)
Income	0.437***	0.437***	0.437***	0.504***	0.504***	0.505***	0.423***	0.423***	0.424***
	(0.00965)	(0.00965)	(0.00966)	(0.0444)	(0.0444)	(0.0445)	(0.00537)	(0.00537)	(0.00537)
Mother Education									
High school graduate	0.0523	0.0531	0.0530	-0.433*	-0.433*	-0.433*	0.273***	0.273***	0.273***
	(0.0323)	(0.0323)	(0.0323)	(0.177)	(0.177)	(0.177)	(0.0139)	(0.0139)	(0.0139)
Some college	0.274***	0.273***	0.273***	-0.141	-0.141	-0.141	0.521***	0.521***	0.521***
	(0.0429)	(0.0429)	(0.0429)	(0.221)	(0.221)	(0.221)	(0.0222)	(0.0222)	(0.0222)
College graduate	0.518***	0.518***	0.518***	0.298*	0.298*	0.298*	0.586***	0.586***	0.586***
	(0.0271)	(0.0271)	(0.0271)	(0.123)	(0.123)	(0.123)	(0.0146)	(0.0146)	(0.0146)
Unknown	-0.522***	-0.522***	-0.522***	-1.642	-1.642	-1.642	-0.321***	-0.323***	-0.323***
	(0.123)	(0.123)	(0.123)	(1.006)	(1.006)	(1.006)	(0.0495)	(0.0495)	(0.0495)
Victim		0.132***	0.133***		-0.0294	-0.0258		0.195***	0.197***
		(0.0383)	(0.0384)		(0.185)	(0.186)		(0.0196)	(0.0196)
Racist			-0.0285			-0.0646			-0.0370
			(0.0590)			(0.275)			(0.0330)
_cons	-4.510***	-4.514***	-4.514***	-8.100***	-8.099***	-8.099***	-1.875***	-1.883***	-1.882***
	(0.0575)	(0.0575)	(0.0575)	(0.276)	(0.276)	(0.276)	(0.0286)	(0.0286)	(0.0286)
N	300870	300870	300870	300870	300870	300870	300870	300870	300870

$*p < 0.05, **p < 0.01, ***p < 0.001$

Table D.13. Logit Regression 2007 - Chapter 5

	pavg	**pavg**	**pavg**	**pmed**	**pmed**	**pmed**	**pnsci**	**pnsci**	**pnsci**
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Black	-0.381***	-0.399***	-0.399***	-0.423***	-0.442***	-0.442***	-0.329***	-0.343***	-0.343***
	(0.0148)	(0.0150)	(0.0150)	(0.0382)	(0.0385)	(0.0385)	(0.0103)	(0.0104)	(0.0104)
Brown	-0.580***	-0.656***	-0.656***	-0.775***	-0.846***	-0.844***	-0.434***	-0.494***	-0.496***
	(0.0288)	(0.0301)	(0.0301)	(0.0899)	(0.0917)	(0.0917)	(0.0171)	(0.0182)	(0.0182)
Indigenous	-0.670***	-0.703***	-0.703***	-0.0271	-0.0592	-0.0596	-0.654***	-0.682***	-0.682***
	(0.107)	(0.107)	(0.107)	(0.233)	(0.233)	(0.233)	(0.0580)	(0.0581)	(0.0581)
Asian	0.220***	0.176***	0.176***	0.384***	0.332***	0.332***	-0.132***	-0.154***	-0.152***
	(0.0303)	(0.0308)	(0.0308)	(0.0457)	(0.0476)	(0.0476)	(0.0316)	(0.0318)	(0.0318)
Female	-0.657***	-0.655***	-0.656***	-0.850***	-0.847***	-0.846***	-0.287***	-0.286***	-0.287***
	(0.0115)	(0.0115)	(0.0115)	(0.0233)	(0.0233)	(0.0233)	(0.00960)	(0.00960)	(0.00960)
Age	-0.195***	-0.196***	-0.196***	-0.125***	-0.126***	-0.126***	-0.0744***	-0.0757***	-0.0754***
	(0.00520)	(0.00520)	(0.00520)	(0.0128)	(0.0128)	(0.0128)	(0.00236)	(0.00236)	(0.00236)
Public school	-1.499***	-1.499***	-1.499***	-1.651***	-1.651***	-1.650***	-1.622***	-1.621***	-1.623***
	(0.0139)	(0.0139)	(0.0139)	(0.0336)	(0.0336)	(0.0336)	(0.0206)	(0.0206)	(0.0206)
Prep course	0.690***	0.687***	0.687***	0.732***	0.730***	0.729***	0.294***	0.291***	0.293***
	(0.0168)	(0.0168)	(0.0168)	(0.0276)	(0.0276)	(0.0276)	(0.0173)	(0.0173)	(0.0173)
Income	0.384***	0.385***	0.385***	0.420***	0.421***	0.420***	0.341***	0.342***	0.342***
	(0.00581)	(0.00581)	(0.00581)	(0.0109)	(0.0109)	(0.0109)	(0.00529)	(0.00529)	(0.00529)
Mother Education									
High school graduate	0.337***	0.338***	0.337***	0.115***	0.116***	0.116***	0.358***	0.358***	0.358***
	(0.0140)	(0.0140)	(0.0140)	(0.0332)	(0.0332)	(0.0332)	(0.0117)	(0.0117)	(0.0117)
Some college	0.580***	0.580***	0.579***	0.274***	0.273***	0.273***	0.552***	0.551***	0.551***
	(0.0240)	(0.0240)	(0.0240)	(0.0456)	(0.0456)	(0.0456)	(0.0287)	(0.0288)	(0.0288)
College graduate	0.647***	0.647***	0.647***	0.482***	0.482***	0.482***	0.540***	0.539***	0.539***
	(0.0163)	(0.0163)	(0.0163)	(0.0298)	(0.0298)	(0.0298)	(0.0206)	(0.0206)	(0.0206)
Unknown	-0.334***	-0.337***	-0.337***	-0.661***	-0.669***	-0.670***	-0.341***	-0.341***	-0.339***
	(0.0508)	(0.0509)	(0.0509)	(0.141)	(0.141)	(0.141)	(0.0300)	(0.0300)	(0.0300)
Victim		0.182***	0.183***		0.172***	0.167***		0.145***	0.150***
		(0.0202)	(0.0203)		(0.0418)	(0.0419)		(0.0150)	(0.0150)
Racist			-0.0320			0.0919			-0.231***
			(0.0373)			(0.0656)			(0.0311)
_cons	-0.819***	-0.828***	-0.827***	-3.539***	-3.547***	-3.548***	1.590***	1.582***	1.588***
	(0.0308)	(0.0309)	(0.0309)	(0.0649)	(0.0650)	(0.0650)	(0.0296)	(0.0296)	(0.0296)
N	256684	256684	256684	256684	256684	256684	256684	256684	256684

$*p < 0.05, **p < 0.01, ***p < 0.001$

Table D.14. Logit Regression 2006 - Chapter 5

	pavg	**pavg**	**pavg**	**pmed**	**pmed**	**pmed**	**pnsci**	**pnsci**	**pnsci**
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Black	-0.410***	-0.426***	-0.426***	-0.673*	-0.668*	-0.665*	-0.360***	-0.381***	-0.381***
	(0.0464)	(0.0468)	(0.0468)	(0.289)	(0.290)	(0.290)	(0.0190)	(0.0192)	(0.0192)
Brown	-1.039***	-1.107***	-1.107***				-0.683***	-0.772***	-0.773***
	(0.129)	(0.130)	(0.130)				(0.0406)	(0.0420)	(0.0420)
Indigenous	-0.898*	-0.932*	-0.932*				-0.599***	-0.640***	-0.640***
	(0.364)	(0.364)	(0.364)				(0.124)	(0.125)	(0.125)
Asian	0.486***	0.438***	0.438***	0.738***	0.755***	0.757***	0.350***	0.292***	0.292***
	(0.0499)	(0.0524)	(0.0524)	(0.201)	(0.212)	(0.212)	(0.0311)	(0.0320)	(0.0320)
Female	-1.015***	-1.012***	-1.012***	-1.384***	-1.385***	-1.382***	-0.866***	-0.864***	-0.864***
	(0.0276)	(0.0276)	(0.0276)	(0.150)	(0.150)	(0.150)	(0.0135)	(0.0135)	(0.0135)
Age	-0.0788***	-0.0798***	-0.0798***	-0.00460	-0.00412	-0.00417	-0.184***	-0.185***	-0.185***
	(0.0147)	(0.0147)	(0.0147)	(0.0758)	(0.0758)	(0.0758)	(0.00681)	(0.00681)	(0.00681)
Public school	-2.096***	-2.094***	-2.094***	-3.199***	-3.199***	-3.199***	-1.617***	-1.616***	-1.616***
	(0.0440)	(0.0440)	(0.0440)	(0.349)	(0.349)	(0.349)	(0.0168)	(0.0168)	(0.0168)
Prep course	0.711***	0.708***	0.708***	0.349*	0.350*	0.348*	0.719***	0.715***	0.715***
	(0.0334)	(0.0334)	(0.0334)	(0.164)	(0.164)	(0.164)	(0.0192)	(0.0192)	(0.0192)
Income	0.404***	0.404***	0.404***	0.463***	0.462***	0.461***	0.379***	0.379***	0.379***
	(0.0125)	(0.0124)	(0.0125)	(0.0586)	(0.0586)	(0.0586)	(0.00652)	(0.00652)	(0.00652)
Mother Education									
High school graduate	0.0562	0.0579	0.0579	-0.257	-0.258	-0.257	0.312***	0.313***	0.313***
	(0.0409)	(0.0409)	(0.0409)	(0.228)	(0.228)	(0.228)	(0.0175)	(0.0175)	(0.0175)
Some college	0.266***	0.267***	0.267***	0.0819	0.0814	0.0819	0.507***	0.507***	0.508***
	(0.0545)	(0.0545)	(0.0545)	(0.275)	(0.275)	(0.275)	(0.0273)	(0.0273)	(0.0273)
College graduate	0.535***	0.536***	0.536***	0.451**	0.450**	0.451**	0.634***	0.635***	0.635***
	(0.0347)	(0.0347)	(0.0347)	(0.165)	(0.165)	(0.165)	(0.0180)	(0.0180)	(0.0180)
Unknown	-0.642***	-0.642***	-0.642***	-0.0454	-0.0455	-0.0504	-0.482***	-0.482***	-0.482***
	(0.156)	(0.156)	(0.156)	(0.596)	(0.596)	(0.596)	(0.0624)	(0.0625)	(0.0625)
Victim		0.148**	0.148**		-0.0537	-0.0693		0.201***	0.202***
		(0.0472)	(0.0474)		(0.225)	(0.226)		(0.0237)	(0.0237)
Racist			-0.00188			0.216			-0.0244
			(0.0682)			(0.289)			(0.0370)
_cons	-3.864***	-3.872***	-3.872***	-7.408***	-7.404***	-7.407***	-1.608***	-1.619***	-1.619***
	(0.0751)	(0.0752)	(0.0752)	(0.372)	(0.372)	(0.372)	(0.0363)	(0.0363)	(0.0363)
N	282653	282653	282653	282653	282653	282653	282653	282653	282653

$*p < 0.05, **p < 0.01, ***p < 0.001$

Table D.15. Logit Regression 2005 - Chapter 5

	pavg	**pavg**	**pavg**	**pmed**	**pmed**	**pmed**	**pfono**	**pfono**	**pfono**
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Black	-0.428***	-0.457***	-0.456***	0.0612	0.0531	0.0570	-0.292***	-0.309***	-0.309***
	(0.0478)	(0.0483)	(0.0483)	(0.202)	(0.203)	(0.203)	(0.0105)	(0.0106)	(0.0106)
Brown	-1.245***	-1.359***	-1.357***				-0.409***	-0.487***	-0.489***
	(0.148)	(0.150)	(0.150)				(0.0188)	(0.0201)	(0.0201)
Indigenous	-0.585	-0.654	-0.654	0.699	0.676	0.675	-0.534***	-0.569***	-0.568***
	(0.342)	(0.343)	(0.343)	(1.009)	(1.011)	(1.011)	(0.0632)	(0.0633)	(0.0633)
Asian	0.538***	0.461***	0.461***	0.592**	0.568**	0.567**	0.0173	-0.0130	-0.0122
	(0.0500)	(0.0528)	(0.0528)	(0.202)	(0.214)	(0.214)	(0.0283)	(0.0286)	(0.0286)
Female	-0.897***	-0.893***	-0.892***	-1.182***	-1.180***	-1.177***	-0.381***	-0.379***	-0.380***
	(0.0272)	(0.0272)	(0.0272)	(0.131)	(0.131)	(0.131)	(0.00920)	(0.00921)	(0.00921)
Age	-0.104***	-0.105***	-0.106***	-0.0721	-0.0725	-0.0731	-0.147***	-0.149***	-0.148***
	(0.0154)	(0.0154)	(0.0154)	(0.0724)	(0.0724)	(0.0724)	(0.00297)	(0.00297)	(0.00297)
Public school	-2.187***	-2.184***	-2.184***	-2.991***	-2.992***	-2.991***	-1.536***	-1.534***	-1.535***
	(0.0441)	(0.0441)	(0.0441)	(0.285)	(0.285)	(0.285)	(0.0145)	(0.0145)	(0.0145)
Prep course	0.703***	0.697***	0.696***	0.624***	0.622***	0.620***	0.397***	0.393***	0.394***
	(0.0334)	(0.0334)	(0.0334)	(0.138)	(0.138)	(0.138)	(0.0159)	(0.0159)	(0.0159)
Income	0.378***	0.378***	0.378***	0.500***	0.500***	0.499***	0.301***	0.302***	0.302***
	(0.0129)	(0.0129)	(0.0129)	(0.0544)	(0.0544)	(0.0544)	(0.00496)	(0.00497)	(0.00497)
Mother Education									
High school graduate	0.208***	0.209***	0.209***	-0.340	-0.339	-0.339	0.395***	0.396***	0.396***
	(0.0410)	(0.0410)	(0.0410)	(0.208)	(0.208)	(0.208)	(0.0111)	(0.0111)	(0.0111)
Some college	0.443***	0.443***	0.443***	0.225	0.225	0.225	0.679***	0.677***	0.677***
	(0.0535)	(0.0535)	(0.0535)	(0.233)	(0.233)	(0.233)	(0.0242)	(0.0242)	(0.0242)
College graduate	0.672***	0.673***	0.674***	0.449**	0.450**	0.451**	0.723***	0.723***	0.723***
	(0.0364)	(0.0364)	(0.0364)	(0.153)	(0.153)	(0.153)	(0.0169)	(0.0169)	(0.0169)
Unknown	-0.920***	-0.926***	-0.927***				-0.475***	-0.476***	-0.474***
	(0.207)	(0.207)	(0.207)				(0.0346)	(0.0346)	(0.0346)
Victim		0.227***	0.224***		0.0694	0.0611		0.169***	0.171***
		(0.0470)	(0.0471)		(0.198)	(0.198)		(0.0149)	(0.0150)
Racist			0.0581			0.188			-0.106***
			(0.0648)			(0.253)			(0.0280)
_cons	-3.700***	-3.713***	-3.714***	-7.309***	-7.315***	-7.316***	0.576***	0.565***	0.567***
	(0.0776)	(0.0776)	(0.0776)	(0.346)	(0.347)	(0.346)	(0.0260)	(0.0260)	(0.0260)
N	268294	268294	268294	268294	268294	268294	268294	268294	268294

$*p < 0.05, **p < 0.01, ***p < 0.001$

Table D.16. Logit Regression 2004 - Chapter 5

	pavg	**pavg**	**pavg**	**pmed**	**pmed**	**pmed**	**pfono**	**pfono**	**pfono**
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Black	0.425**	0.424**	0.424**	0.440	0.438	0.438	0.291**	0.289**	0.289**
	(0.131)	(0.131)	(0.131)	(0.242)	(0.242)	(0.242)	(0.0963)	(0.0963)	(0.0963)
Brown	-0.318	-0.328	-0.328	-0.903	-0.924	-0.924	-0.607**	-0.613**	-0.613**
	(0.356)	(0.357)	(0.357)	(1.017)	(1.018)	(1.018)	(0.214)	(0.215)	(0.215)
Indigenous	-0.253	-0.258	-0.258	-0.0413	-0.0486	-0.0484	-0.504***	-0.507***	-0.507***
	(0.135)	(0.135)	(0.135)	(0.285)	(0.285)	(0.285)	(0.0784)	(0.0784)	(0.0784)
Asian	1.302***	1.301***	1.301***	0.894***	0.892***	0.894***	1.084***	1.083***	1.083***
	(0.0882)	(0.0882)	(0.0882)	(0.157)	(0.158)	(0.158)	(0.0758)	(0.0758)	(0.0758)
Female	-0.986***	-0.984***	-0.984***	-1.143***	-1.139***	-1.139***	-0.807***	-0.806***	-0.806***
	(0.0204)	(0.0204)	(0.0204)	(0.0447)	(0.0448)	(0.0448)	(0.0130)	(0.0130)	(0.0130)
Age	-0.133***	-0.134***	-0.134***	-0.0554*	-0.0564*	-0.0563*	-0.180***	-0.181***	-0.181***
	(0.0125)	(0.0125)	(0.0125)	(0.0257)	(0.0257)	(0.0257)	(0.00762)	(0.00762)	(0.00762)
Public school	-1.776***	-1.777***	-1.777***	-2.090***	-2.091***	-2.091***	-1.563***	-1.564***	-1.564***
	(0.0283)	(0.0283)	(0.0283)	(0.0708)	(0.0708)	(0.0708)	(0.0158)	(0.0158)	(0.0158)
Prep course	0.758***	0.755***	0.755***	0.785***	0.783***	0.782***	0.677***	0.675***	0.675***
	(0.0253)	(0.0253)	(0.0253)	(0.0483)	(0.0483)	(0.0483)	(0.0180)	(0.0180)	(0.0180)
Income	0.352***	0.352***	0.352***	0.385***	0.386***	0.385***	0.332***	0.332***	0.332***
	(0.00930)	(0.00931)	(0.00931)	(0.0189)	(0.0190)	(0.0190)	(0.00615)	(0.00616)	(0.00616)
Mother Education									
High school graduate	0.182***	0.183***	0.183***	-0.00602	-0.00409	-0.00392	0.341***	0.342***	0.342***
	(0.0292)	(0.0292)	(0.0292)	(0.0665)	(0.0666)	(0.0666)	(0.0169)	(0.0169)	(0.0169)
Some college	0.439***	0.440***	0.440***	0.467***	0.467***	0.468***	0.568***	0.568***	0.568***
	(0.0390)	(0.0390)	(0.0390)	(0.0786)	(0.0786)	(0.0786)	(0.0255)	(0.0255)	(0.0255)
College graduate	0.647***	0.648***	0.648***	0.566***	0.568***	0.568***	0.714***	0.714***	0.714***
	(0.0264)	(0.0264)	(0.0264)	(0.0547)	(0.0547)	(0.0547)	(0.0174)	(0.0174)	(0.0174)
Unknown	-0.616***	-0.619***	-0.619***	-0.897**	-0.901**	-0.902**	-0.422***	-0.424***	-0.424***
	(0.111)	(0.111)	(0.111)	(0.283)	(0.283)	(0.283)	(0.0584)	(0.0584)	(0.0584)
Victim		0.0875**	0.0873**		0.123	0.120		0.0625**	0.0621**
		(0.0336)	(0.0337)		(0.0680)	(0.0682)		(0.0216)	(0.0216)
Racist			0.00315			0.0488			0.00898
			(0.0474)			(0.0927)			(0.0323)
_cons	-3.090***	-3.101***	-3.101***	-5.053***	-5.069***	-5.070***	-1.550***	-1.558***	-1.558***
	(0.0580)	(0.0582)	(0.0582)	(0.122)	(0.123)	(0.123)	(0.0366)	(0.0367)	(0.0367)
N	249708	249708	249708	249708	249708	249708	249708	249708	249708

$*p < 0.05, **p < 0.01, ***p < 0.001$

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This dissertation was typed in LaTeX2 by the author. [1]

[1] LaTeX is a document preparation system for the TeX typesetting program. It offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing, tables and figures, page layout, bibliographies, and much more. LaTeX was originally written in 1984 by Leslie Lamport and has become the dominant method for using TeX; few people write in plain TeX anymore. The current version is LaTeX 2_ε.