

Using Brazil's Racial Continuum to Examine the Short-Term Effects of Affirmative Action in Higher Education

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In 2004, the University of Brasilia established racial quotas reserving 20% of available admissions slots for blacks. Using admissions data and a student survey, we characterize the impact of the policy on the racial composition of students, examine the academic performance of quota students, and estimate the effect of quotas on pre-university effort and racial identity. We find no evidence that the policy reduced effort in secondary school or college admissions. We also find that quotas increased the likelihood that applicants and students, especially those in the middle of the racial continuum, self-identified as black.

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I. Introduction

About 40.6% of all slaves in the Trans-Atlantic Slave Trade between 1519 and 1867 arrived in Brazil (Eltis, 2001). That is approximately ten times the number of slaves that arrived in British Mainland North America. As a result, Brazil has had a large black and mixed-race population. In 2007, about 49.4% of Brazil's population of 184 million was *branco*, 42.3% *pardo*, 7.5% *preto*, and 0.8% Indigenous or Asian (IBGE, 2009).¹ Even though the rate of ethnic intermarriage is relatively high, significant racial disparities in education, income, health, and other dimensions continue to exist (Telles, 2004). For this reason, policy makers have been considering ways to minimize racial inequality. Since 2001, a handful of universities have adopted an affirmative action program involving racial quotas in admissions, and this year the Brazilian National Congress is debating proposals to extend quotas to all public universities and to extend affirmative action to all federal public sector employment.

In this paper, we examine the experience of the University of Brasilia (UnB), which established racial quotas in July 2004 making it the first federal university in the country and the only university in the region to do so. At UnB, 20% of available admissions slots are reserved for students who self-identify as *negro* (black). Individuals who are selected for admission under the quota system are required to attend an interview with a university panel that verifies that they are "black enough" to qualify.² Not only does this provide an opportunity to address important policy questions but also an opportunity to investigate a number of academic questions regarding affirmative action in higher education, including the effect of racial quotas on pre-university

¹ Throughout the paper, we use various racial terms in Portuguese. The term "branco" refers to whites, typically individuals with light skin color, "pardo" refers to black-white mixed-race individuals, typically those with intermediate skin color, and "preto" refers to blacks, typically those with dark skin color. The term "negro" is indicative of black racial identity.

² Initially, individuals had to submit to a photograph instead of an interview. The university replaced the photo requirement after a national magazine exposed the case of two identical twins, Alan and Alex, one of whom was considered black by the panel and the other of whom was considered white (Zakabi and Camargo, 2007).

effort and on racial identity. We are able to use some of the unique features of Brazil to estimate the effects. Since most students attend college in their home region and the policy was unexpected, UnB serves as a natural experiment of sorts. Plus, affirmative action is new to Brazil, and we may analyze the periods before and after the implementation of the policy. We are also able to take advantage of Brazil's racial continuum, as some students are black enough to qualify, while others are not black enough.

The objectives of the paper are to characterize the impact of the policy on the racial composition of students at UnB, examine the academic performance of quota students, and estimate the effect of quotas on pre-university effort and racial identity. To this end, we acquired academic records for all students who matriculated at UnB in addition to admissions records for about 90,000 unique individuals who registered for the entrance exam two admissions-cycles before the implementation of quotas and three cycles afterwards. We also conducted a survey of students who matriculated before and after the implementation of the quota system. All in all, we obtained about 1,000 face to face and 2,000 online interviews making this one of the largest research projects on affirmative action in higher education. Moreover, it is the first to use individual-level data to examine the introduction of an affirmative action program, the first to identify separate effects for those of different skin tones, and one of the few to study the construction of racial identity.

To begin, we find that racial inequality exists in samples of students, applicants, and residents of Distrito Federal. *Branco*s tend to have higher socioeconomic status than *pardos*, and *pardos* tend to have higher status than *pretos*. It is essential to establish the existence of racial inequality, since one of the main reasons for enacting an affirmative action policy directed toward blacks was to reduce racial disparities, and many Brazilians have the notion that

socioeconomic status is uncorrelated with race. Based on an analysis of self-reported identity as well as photographs, racial quotas appear to have raised the proportion of blacks/darker-skinned students at UnB and lowered the proportion of non-blacks/lighter-skinned students. This was perhaps most pronounced during the initial semester of quotas. Additionally, quota students tend to have lower grades than non-quota students, but the difference is considerably less than that between male and female students. The disparity in academic performance between quota and non-quota students is attributable to differential performance on the vestibular and, to a lesser extent, race and socioeconomic status.

In principle, affirmative action may raise or lower the returns to investments that raise the likelihood of college admission. Focusing on UnB students and applicants, we find no evidence that racial quotas had reduced effort in secondary school or college admissions. Indeed, some evidence exists suggesting that the policy may have raised effort. Quota students and applicants as well as *pardo* applicants after the implementation of quotas were more likely to take a college entrance exam preparation course. Dark-skinned students matriculating after the implementation of quotas were more likely to report high effort and grades in secondary school. Plus, quota and *pardo* applicants after quotas were more likely to attempt the vestibular multiple times. These findings make sense considering that there exists a hierarchy of majors with vastly different minimum scores for selection and hence, few applicants are truly intra-marginal.

Furthermore, we find evidence that quotas at UnB increased the likelihood that applicants and students, especially those in the middle of the racial continuum, self-identified as black. Using the student survey, which minimizes the incentive to misrepresent racial identity, difference-in-difference and panel specifications imply that the quota system may have inspired actual change in racial identity for students at the margin. Using the university admissions

survey, which is more susceptible to misrepresentation, analogous specifications yield larger estimated effects, which suggest that the quota system may have spurred both actual change and misrepresentation for applicants at the margin. These findings are consistent with the incentives engendered by the policy. To be sure, the incentive to apply under the quota system was significant given the competitiveness of admissions, and programs for quota students reinforced and fostered investments in identity. Therefore, racial identity may respond to incentives.

This paper contributes to the economics of affirmative action in higher education and to the economics of race and identity. Economists have long been interested in affirmative action. Many studies concern employment and performance in the labor market (Coate and Loury, 1993; Donohue and Heckman, 1991; Fryer and Loury, 2005a, 2005b; Holzer and Neumark, 2000; Leonard, 1984a, 1984b, 1984c, 1990; Smith and Welch, 1984). Recently, a number of theory papers have examined efficiency justifications for maintaining or eliminating affirmative action in college admissions (Abdulkadiroglu, 2005; Chan and Eyster, 2003; De Fraja, 2005; Epple, Romano, and Sieg, 2008; Fryer, Loury, and Yuret, 2008). Most relevant to this paper are studies that explore the incentive effects of affirmative action on investments in effort and skills prior to university matriculation (Fryer and Loury, 2005a; Fryer, Loury, and Yuret, 2008; Holzer and Neumark, 2000). Essentially, they argue that the direction of the effect is ambiguous, i.e. that racial preference in college admissions, in theory, may either spur or discourage effort.

Nearly all empirical papers about affirmative action in higher education focus on the US experience (Bowen and Bok, 1998). Several investigate how the elimination of affirmative action and other state-level policy changes might impact the enrollment of minority students in college (Card and Krueger, 2005; Conrad and Sharpe, 1996; Dickson, 2006; Long 2004a, 2004b). Generally, the evidence suggests that dismantling or replacing affirmative action may lower the

number of minorities in college. Other studies examine the academic performance of minorities and subsequent gains to minorities in the labor market (Arcidiacono, 2005; Loury and Garman, 1993; Rothstein and Yoon, 2008). Notably, Rothstein and Yoon (2008) employ an effective empirical strategy in tracking students across time. These studies find that the labor market gains of minorities likely outweigh the potential costs of "mismatch." Similarly, this paper is concerned with the effect of affirmative action on the enrollment of historically underrepresented racial groups and also with their academic performance in college.

Some research looks at affirmative action in developing countries like India and Brazil. For a number of years, India has had quotas for underrepresented castes (Bertrand, Hanna, and Mullainathan, 2008; Desai and Kulkarni, 2008). Bertrand, Hanna, and Mullainathan (2008) evaluate the efficiency of a quota system at an engineering college in India. They interviewed about 700 households from the college applicant pool about 8-10 years after the entrance exam. They find that the program successfully targeted poorer students who, in spite of lower entrance exam scores, enjoyed substantial gains in the labor market. However, the gains for marginal upper-caste students were larger than those for marginal lower-caste students.

Other papers study the case of Brazil (Andrade, 2004; Cardoso, 2008; Ferman and Assunção, 2005). Ferman and Assunção (2005) employ a difference-in-difference framework to investigate whether black secondary school students residing in states with a university adopting racial quotas had higher or lower scores on a proficiency exam. To our knowledge, this is the only other paper to empirically examine incentive effects on effort. They find that scores were lower, which they argue is evidence of decreased effort due to quotas. Nevertheless, the authors are unable to identify which secondary school students actually applied to a university with quotas. Even with quotas, the average black secondary school student would have had only a

very small chance of admission. Moreover, self-reported racial identity may have been correlated with test scores as well as the implementation of quotas making the results difficult to interpret.

Based on tabulations of university records, Cardoso (2008) finds that quotas at UnB increased the proportion of *negro* students; quota students had lower attrition rates than non-quota students; and quota students had comparable grades to non-quota students except in selective majors. In this paper, we are able to explore these and other questions emphasizing that, since black identity is endogenous, the answers are much more subtle than they might appear. Focusing on UnB students and applicants, Francis and Tannuri-Pianto (2010a) further study the construction of racial identity among young adults in Brazil characterizing the basic aspects of identity, investigating the effects of family background and academic performance, and estimating the impact of quotas. Francis and Tannuri-Pianto (2010b) evaluate whether quotas at UnB might reduce the racial wage gap, while Francis and Tannuri-Pianto (2010c) examine the redistributive efficacy of affirmative action exploring the role of race and socioeconomic status in admissions.

This paper also contributes to the economics of race and identity. A number of papers demonstrate the importance of skin tone—beyond the influence of race—in education, employment, and family (Bodenhorn, 2006; Goldsmith, Hamilton, and Darity, 2006, 2007; Hersch, 2006; Rangel, 2007). A growing body of literature analyzes the role of identity in behavior and decision-making (Akerlof and Kranton, 2000, 2002; Austen-Smith and Fryer, 2005; Darity, Dietrich, and Hamilton, 2005; Darity, Mason, and Stewart, 2006; Francis, 2008; Fryer et al., 2008; Golash-Boza and Darity, 2008; Ruebeck, Averett, and Bodenhorn, 2009). These studies consider how identity may affect behavior/markets and how behavior/markets may affect identity.

The remainder of the paper is organized as follows. Section II provides background information on university education in Brazil and UnB's affirmative action policy. Section III describes the data and empirical strategy. Section IV presents the results. Section V articulates policy recommendations and suggests future research.

II. Background and Affirmative Action Policy

Brazil is a country where the adult illiteracy rate, 14.3% in 2004, is still substantially higher than the proportion of the adult population with a college degree, around 8% (PNAD, 2004). Returns to college education are relatively high in Brazil, as having a college degree is strongly associated with a variety of measures of wellbeing and represents an important source of social mobility. Most college students attend an institution in the region where their family resides, and many continue to live with their parents. About 26% of college students attend public universities (PNAD, 2004). Public universities are tuition-free and generally better quality than private universities. To be considered for admission, candidates select one course of study (major department) to which to apply and take an institution-specific entrance exam called the vestibular. It is typically a two-day exam with questions in subjects including Portuguese, English or Spanish, geography, history, mathematics, biology, physics, and chemistry. The overall score on the vestibular is the primary basis for admission, and the minimum score for selection varies by department. While an individual may select only one course of study per attempt, he or she may attempt to pass the vestibular any number of times.

The University of Brasilia (UnB) is one of the best public universities in Brazil. It is located in Brasilia, a city of about 3.5 million (metro area) and the capital of Brazil. Most undergraduates are from the state (Distrito Federal). At UnB, a majority of students are admitted

through the vestibular system, as described above.³ Admission is highly competitive. Two admission exams are offered annually, one in January and another in July. Non-quota and quota students are selected based on their overall score, and they must also achieve a certain minimum score on each of the subsections. A new cohort of undergraduate students enters every semester (twice a year), and the average size of each cohort is approximately 2,200. Every semester, there are approximately 32,000 candidates for admission.

UnB established racial quotas in July 2004 making it the first federal university in the country and the only university in the region to do so. The policy was announced on June 6, 2003. According to its architects, some of the major objectives of the policy are to fight racial inequalities, compensate for historical injustices, contribute to the diversity of experiences and perspectives on campus, and raise understanding of what it means to be black in Brazil. 20% of available vestibular admissions slots are reserved for students who self-identify as *negro*. Individuals who are selected for admission under the quota system are required to attend an interview with a university panel that verifies that they are "black enough" to qualify. Moreover, UnB provides to those who matriculate as quota students an array of programs and services that reinforce and foster investments in black identity. For example, these include lectures and events on the value of blacks in society; an academic tutoring program for quota students; and a permanent space on campus for quota students to study, meet, and have cultural activities.

Table 1 displays the number of applicants and admissions standards by department for the initial semester of quotas, i.e. the second semester of 2004 (2-2004). For individuals who applied under the non-quota system, the non-quota admissions score (NQ) was the minimum score necessary for selection. For those who applied under the quota system, the quota

³ In January, half of slots are reserved for admission through the PAS program (Programa de Avaliação Seriada). PAS was instituted in 1999, and admission is based on exams taken in each year of secondary school.

admissions score (Q) was the minimum score necessary for selection. As the table shows, variability in admissions scores and degree of selectivity is enormous. For instance, courses of study like medicine, law, and engineering are extremely selective, while geography, library science, and fine arts are not. For most departments, the non-quota admissions score is greater than the quota admissions score, indicating that departments have explicitly lower standards for at least some quota students. Particularly among relatively selective courses of study, the number of non-quota students who were not selected but had a vestibular score above the quota admissions score was greater than the number of selected non-quota and quota students combined. Among relatively selective courses, many admitted quota students would not have been selected if it were not for the lower quota admissions score.

Table 2 displays the number of applicants and admissions standards by semester aggregating over departments. The average selection rate at UnB, which varies hugely by department as the previous table demonstrates, was less than 10%. The average rate for quota applicants was slightly greater than that for non-quota applicants. Albeit not reported in the table, about 76.0% of those individuals who were selected actually matriculated at UnB. This yield rate is higher than of Princeton and Yale. What is apparent in the table is that the proportion of admitted quota students who had exam scores above the cutoff for non-quota students increased with time. By the second semester of 2005, three-fourths of them presumably would have been selected even in the absence of the policy. This trend may be explained by endogenous changes in the composition of the pool of quota applicants, which we discuss later in the paper.

III. Data and Empirical Strategy

Populations of Interest

There are two populations of interest. The first consists of individuals who registered for the UnB vestibular exam two admissions cycles before (semesters of anticipated matriculation 2-2003 and 1-2004) or three cycles after the implementation of the quota system (semesters of anticipated matriculation 2-2004, 1-2005, and 2-2005). We refer to this population as "applicants." The second consists of individuals who were admitted through the vestibular system and matriculated two admissions cycles before (2-2003 and 1-2004) or three cycles after the implementation of the quota system (2-2004, 1-2005, and 2-2005). We refer to this population as "students." We draw on two principal data sources: university records and a student survey conducted by the authors.

University Records

University admissions records were provided to the authors by CESPE, the organization that administers every aspect of admissions and selection at UnB. Records encompass all individuals who registered for the vestibular exam during the five admissions cycles from 2-2003 to 2-2005. Records include individuals who were and were not selected for admission and those who took the exam multiple times. There are almost 150,000 entries altogether with about 90,000 unique individuals. For all who took the exam, we have data on semester of anticipated matriculation, course of study, system of admissions (quota/non-quota), gender, place of residence, exam results including sub-scores and overall score, and selection outcome. Using names and other personal information, we are able to link multiple entries corresponding to the same individual.

Admissions records also include an optional 18-question survey, which applicants submitted upon registration for the vestibular (thus, prior to taking the exam). This survey, the

Socio-Cultural Questionnaire (to which we refer by its Portuguese acronym QSC), asks about marital status, family income, family housing, parents' education, labor market participation, public/private secondary school, place of residence, and several questions regarding preparation for the vestibular. It was not until 2004, one semester before the implementation of quotas, that questions about race were added to the QSC. The item "what is your race/color?" has answer choices: *branco*, *pardo*, *preto*, Asian, Indigenous, and "no answer." Another item asks "do you consider yourself black (*negro*)?" An important caveat is that response rates were falling during the study period. We do not know if this phenomenon was related to quotas, but we do know that response rates had been falling prior to quotas. The overall response rate declined from about 84% to 36% between 2-2003 and 2-2005. For quota applicants, the response rate declined from about 93% to 74% between 2-2004 and 2-2005.

We also had access to university academic records. These data were provided by DAA (Division of Academic Affairs), the organization that manages course registration, graduation, and student transcripts at UnB. Academic data include grades and number of credits by semester of study for all students who had matriculated during the five semesters from 2-2003 to 2-2005. Grades range from zero to five, where five is the best grade possible, and zero is the worst. With this information, we are able to calculate overall GPA, attrition rates, and other statistics.

PSEU

The second principal data source is a student survey conducted by the authors, the University Education Survey (to which we refer by its Portuguese acronym PSEU). There were several reasons why collecting additional data was necessary: to obtain more information about students than what the QSC and other university records could provide; to measure race in

multiple ways; and to create panel data by asking some of the same questions as the QSC. We conducted two types of interviews: face to face with an interviewer and online. Data collection is described in the Data Appendix. The total number of observations is 2,846. We were also able to obtain 960 photos of respondents who participated in the face to face interviews.

The full version of the PSEU questionnaire entailed approximately 200 questions and covered topics including demography/family background, pre-university education, university admissions, university education, employment, future/expectations, and race. We were especially careful regarding how and when we asked about race and affirmative action, since we wanted to avoid raising awareness of these concepts before it was necessary and wanted to obscure the true purposes of the survey. For example, the title of the survey was intentionally general, and we never mentioned race or affirmative action in any of our contacts with potential respondents. We only asked respondents about race in the final section of the face to face interview and asked about their opinion of affirmative action on a separate, self-administered form at the conclusion of the interview.

We measured race in multiple ways. First, with the respondent's consent, the interviewer took a photo of the respondent's student identification card, which had a standardized photo taken by the university upon matriculation. We later cropped the photos, arranged them in a random order, and allowed a panel of Brazilians (the interviewers and others unaffiliated with the university) to rate the race and skin tone of each of the respondents. Second, at the beginning of the interview, the interviewer recorded his or her rating of the respondent's race and skin tone. Third, in the final section of the interview, the interviewer queried the respondent about his or her race. The initial race question was open-ended. Respondents were simply asked to describe their racial identification in one or two words. Then they were asked to place themselves into one

of five standard racial categories. Like the QSC, we asked respondents whether they considered themselves black (*negro*), but unlike the QSC, we offered respondents the option to say that they did not know. We also inquired about the race of their parents.

Empirical Strategy

In what follows, we present three sets of results. First, we characterize the relationship between race and socioeconomic status in samples of students, applicants, and residents of Distrito Federal. We also describe racial and socioeconomic change at UnB before and after the implementation of quotas. Tables 3-6 contain these results. Second, we evaluate the academic performance of quota students in terms of GPA and study effort. Tables 7-8 contain these results. Third, we estimate the effect of the quota system on pre-university effort and racial identity. To do so, we exploit the cross-sectional and panel nature of the data. Tables 9-15 contain these results. In regressions, we utilize a standard set of covariates: race, gender, having lived with both parents at age 14 (PSEU), mother's education, having domestic workers at home (PSEU), having attended a public secondary school, family income (QSC), semester of matriculation, overall score on the vestibular, and indicators for area of study (social science, arts & humanities, hard science, other science, engineering, professional, health, teaching, and business).

We estimate the effect of the quota system in several different ways. The most straightforward is to regress the outcome variable on quota status, race, semester of matriculation, and other covariates. The parameters of the following model are estimated using

ordinary least squares: $Y_i = \alpha + \tau \cdot Q_i + \sum_{t=1}^T \beta_t \cdot 1[T_i = t] + \sum_{r=1}^R \delta_r \cdot 1[R_i = r] + \gamma \cdot X_i + \varepsilon_i$, where τ is

the effect of the quota system, Q_i is the quota status indicator, T_i is the semester indicator, R_i is

the race indicator, and X_i represents other individual characteristics. However, concern remains regarding selection into the quota system. For this reason, it may helpful to think of the policy as a treatment on *pardos* and *pretos*, so that a difference-in-difference approach can be taken (Imbens and Wooldridge, 2009). In some specifications, we regress the outcome variable on an indicator for being *pardo* and matriculating in the post-quota period, an indicator for being *preto* and matriculating in the post-quota period, race, semester of matriculation, and other covariates:

$$Y_i = \alpha + \tau^{pardo} \cdot I_i^{pardo} + \tau^{preto} \cdot I_i^{preto} + \sum_{t=1}^T \beta_t \cdot 1[T_i = t] + \sum_{r=1}^R \delta_r \cdot 1[R_i = r] + \gamma \cdot X_i + \varepsilon_i, \text{ where } \tau^{pardo}$$

is the effect of the quota system on *pardos*, τ^{preto} is the effect of the quota system on *pretos*, I_i^{pardo} is an indicator for respondent i being *pardo* and matriculating in the post-quota period, and I_i^{preto} is an indicator for i being *preto* and matriculating in the post-quota period.

We also make use of the 960 photos that were taken in the face to face interviews. We asked a group of Brazilian reviewers to rate the skin tone of the subject in each photo from 1 (light) to 7 (dark). We standardized the scores by reviewer, averaged the standardized scores by photo, and ranked the photos according to average standardized score. We designated the top 25% of scores as "dark." Based on this measure, we examine the effect of the quota system on dark-skinned individuals. In particular, we regress the outcome variable on an indicator for having dark skin tone and matriculating in the post-quota period, an indicator for having a dark skin tone, the average standardized skin tone measure, semester of matriculation, and other

covariates:
$$Y_i = \alpha + \tau^{dark} \cdot I_i^{dark} + \lambda \cdot D_i + \sum_{t=1}^T \beta_t \cdot 1[T_i = t] + \sum_{r=1}^R \delta_r \cdot 1[R_i = r] + \gamma \cdot X_i + \varepsilon_i, \text{ where}$$

τ^{dark} is the effect of the quota system on individuals with a dark skin tone, I_i^{dark} is an indicator

for respondent i having a dark skin tone and matriculating in the post-quota period, and D_i is an indicator for having a dark skin tone.

Lastly, we formulate a specification that utilizes the panel nature of the data. As we have remarked, a number of individuals had applied to UnB multiple times. Some of these did so before and after the imposition of racial quotas. We are able to see if applying as a quota applicant in the post-quota period might have an effect on whether an individual considers him or herself *negro*, conditional on his or her self-reported racial identity in the pre-quota period.

The basic regression is the following:
$$Y_{i1} - Y_{i0} = \alpha + \tau \cdot Q_i + \theta \cdot Y_{i0} + \sum_{r=1}^R \delta_r \cdot \mathbb{1}[R_i = r] + \gamma \cdot X_i + \varepsilon_i,$$

where τ is the effect of the quota system, Q_i is an indicator for whether the respondent was a quota student/applicant (in the post-quota period), Y_{i1} is black identity in the post-quota period, and Y_{i0} is black identity in the pre-quota period. In practice, we fully interact quota status with black identity in the pre-quota period. We also use the fact that some of the subjects in the PSEU also answered the QSC. Adopting an analogous framework, we examine how quota status predicts change in racial identity between the QSC and PSEU.

IV. Results and Discussion

Racial Inequality in Brazil

One of the main reasons for enacting an affirmative action policy directed toward blacks was to reduce racial disparities. Thus, in the first place, it is essential to establish the existence of racial inequality, especially since many Brazilians have the notion that socioeconomic status is uncorrelated with race. Table 3 characterizes the relationship between race and socioeconomic status in samples of students, applicants, and residents of Distrito Federal.

Estimates from the 2004 PNAD (comparable to the CPS) reveal significant racial inequality in Distrito Federal. For 18 to 60 year olds, the percentage of *brancos* with a college education (24.2%) is roughly three times higher than the percentage of *pardos* and *pretos* with a college education (8.4% and 6.4%, respectively). Racial differences in having a computer, internet, refrigerator with freezer, washing machine, and only one bathroom are large. For example, about 44% of *brancos* have access to the internet at home, while less than 20% of *pardos* and *pretos* do. Moreover, the percentage of *pardo* and *preto* households that are low income (less than three times the monthly minimum wage) is almost twice the percentage of *branco* households that are low income. The percentage of *branco* households that are high income (more than 20 times the monthly minimum wage) is two to three times higher. Estimates for 15 to 24 year olds, individuals of secondary school and college-age, exhibit analogous patterns.

The PSEU and QSC include many comparable measures of socioeconomic status. For students at UnB, 62.8% of *brancos*, 45.9% of *pardos*, and 38.8% of *pretos* have a mother with a college education. 28.5% of *brancos*, 43.1% of *pardos*, and 63.4% of *pretos* attended a public secondary school. The percentage of *pardo* households that is low income is almost two times bigger than the percentage of *branco* households that is low income, whereas the percentage of *preto* households is almost three times bigger. 38.2% of *branco* households, 23.4% of *pardo* households, and 15.0% of *preto* households have high income. Estimates for applicants to UnB also show that *brancos* tend to have higher socioeconomic status than *pardos*, and *pardos* tend to have higher socioeconomic status than *pretos*.

Comparisons across racial groups within each subpopulation expose a number of racial disparities, while comparisons across subpopulations within each racial group reveal disparities

independent of race. Table 3 suggests that UnB students are much different than the general population. For example, *branco* students are almost three times more likely than *branco* 15-24 year olds living in Distrito Federal to have a mother with a college degree, *pardo* students are five times more likely than *pardo* 15-24 year olds, and *preto* students are 35 times more likely. This is consistent with Ferreira and Veloso (2003) who contend that intergenerational transmission of human capital in Brazil is substantially higher for children of college-educated parents. Also, for each racial group, the percentage of students with low family income is lower than the corresponding percentage of 15-24 year olds with low family income, and the percentage of students with high family income is higher than the percentage of 15-24 year olds with high family income. Nevertheless, *pardo* and *preto* students are not necessarily more socioeconomically advantaged than *brancos* in the population. The percentage of *branco* 15-24 year olds with high family income (26.8%) is greater than both the percentage of *pardo* (23.4%) and *preto* students (15.0%) with high family income.

To summarize, racial inequality exists in samples of students, applicants, and residents of Distrito Federal. *Brancos* tend to have higher socioeconomic status than *pardos*, and *pardos* tend to have higher status than *pretos*. Disparities independent of race also prevail. Conditional on racial group, UnB students are considerably more advantaged than the general population.

Racial Change at UnB

An important question is regarding what impact the quota policy had on the racial composition of students at UnB. Based on self-reported race, Table 4 contrasts the racial profile of the university before and after quotas. Following the implementation of the policy, the percentage of *brancos* decreased, and the percentage of *pretos* increased. The percentage of

pardos increased, but the change is not significant. However, it appears that the sizable rise in the proportion of *preto* students was only temporary. Although the percentage of *pretos* rose from 6.0% in 2-2003 to 11.8% in 2-2004, the first semester of quotas, it subsequently fell to 6.7% in 2-2005. To shed light on this curious finding, Table 5 examines the racial composition of quota students. In 2-2004, roughly half of quota students and applicants were *preto* and half were *pardo*. But afterwards the proportion of *pardos* increased dramatically. By 2-2005, *pardos* were the majority of quota applicants and 70% of quota students. This may explain the drop in the percentage of *pretos* as well as the rise in entrance exam scores of quota students, as illustrated by Table 2, since presumably better-qualified *pardos* began to apply under the quota system.

However, using self-reported race could be problematic considering the possible endogeneity of racial identity. Figures 1 through 3 are histograms of the average standardized skin tone score based on ratings of respondent photos by a panel of Brazilian reviewers. Light skin tone is to the left, and dark skin tone is to the right. Figure 1 displays the distribution of skin tone in 2-2003, one year prior to the implementation of quotas. As the next figure shows, in 2-2004 the entire distribution shifts sharply to the right, and the right tail thickens, which indicates that the policy caused the student population to become darker. In 2-2005 the right tail thins somewhat relative to the distribution in 2-2004, but it is apparent that students matriculating in the semesters after quotas are darker than those matriculating in the semester before quotas. Taken together, the evidence suggests that the policy raised the proportion of blacks/darker-skinned students and lowered the proportion of non-blacks/lighter-skinned students, and that this was perhaps most pronounced during the initial semester of quotas.

Another question is what impact affirmative action had on the percentage of socioeconomically disadvantaged students at UnB. Table 6 compares socioeconomic status before and after quotas. There is little difference in many of the measures between the pre- and post-quota periods. However, after the policy was enacted, a significantly lower percentage of students was raised with both parents, a higher percentage had no domestic workers, and a lower percentage had high family income. Deconstructing the change by semester, it is apparent that the most socioeconomically disadvantaged cohort was 2-2004. This makes sense given that the initial semester of quotas had the greatest proportion of *pretos*, and *pretos* were the poorest racial group. Further analysis involves comparing individuals who were not admitted but would have been if the quota system had not existed with those who were admitted but would not have been if the quota system had not existed. Francis and Tannuri-Pianto (2010c) find that displaced applicants were considerably more black than displaced applicants and were, by many measures, from families with significantly lower socioeconomic status.

Academic Performance of Quota Students at UnB

The debate in economics about "mismatch" and the pervasive belief in Brazil that quota students drastically underperform inspire us to examine the academic performance and effort of quota students at UnB.⁴ Table 7 displays regressions of GPA on quota status, gender, score on the vestibular, socioeconomic variables, race, subject area, and semester of matriculation. To contextualize the estimated coefficients, note that the population standard deviation of GPA is about 0.71. The regression in the first column involves all students admitted through the vestibular or PAS system. Conditional on gender, subject area, and semester of matriculation, the

⁴ Sample selection due to attrition might be a concern when evaluating the academic performance of quota students. However, based on comprehensive academic records, the attrition rate of quota students at UnB was lower than that of non-quota students for every semester of matriculation. The overall attrition rate was less than 5%.

GPA of quota students was about 0.14 points lower than that of non-quota students. This difference is roughly 20% of the standard deviation of GPA. Moreover, the GPA of female students was about 0.32 points higher than that of males. That quota students had lower scores on the vestibular explains part of the difference in GPA. The regression in the second column reveals that holding constant score on the vestibular, the GPA of quota students was only about 0.08 points lower. The gender gap persists. Adding controls for socioeconomic status further reduces the magnitude of the coefficient on quota status, but it remains significant. The fourth column controls for race, and the difference between quota and non-quota students is no longer significant. Therefore, quota students tend to have lower grades than non-quota students, but the difference is considerably less than that between male and female students. The disparity in academic performance between quota and non-quota students is attributable to differential performance on the vestibular and, to a lesser extent, race and socioeconomic status.

Table 8 displays regressions of study effort on quota status, gender, GPA, socioeconomic variables, race, subject area, and semester of matriculation. Effort, based on a question from the PSEU, is the daily number of hours spent studying during the most recent academic semester. The average number of daily study hours in the sample is around three. As the first two columns demonstrate, quota students report that they study significantly more than non-quota students. Female students study significantly more than male students, and GPA is positively associated with study hours. However, when socioeconomic status and race are added to the regressions, the difference between quota and non-quota students becomes insignificant. Female, GPA, and public secondary school attendance have positive and significant coefficients. Hence, quota students have slightly greater study effort than non-quota students, and the difference is mostly

attributable to socioeconomic status, since students who attended public secondary school tended to study more.

Effects on Pre-University Effort

Examining both students and applicants, we estimate the effect of racial quotas on effort in secondary school and university admissions. As articulated earlier, a race-based affirmative action program may theoretically have two basic kinds of effects on effort (Fryer and Loury, 2005a; Fryer, Loury, and Yuret, 2008; Holzer and Neumark, 2000). On one hand, affirmative action may increase the returns to investments that raise the likelihood of college admission. Changes in admissions standards might relocate some individuals who otherwise would have had little chance of selection (extra-marginal) to the margin of selection, thereby inspiring effort. On the other hand, affirmative action may decrease the returns to investments that raise the likelihood of admission. Changes in admissions standards might relocate some individuals who otherwise would have been at the margin of selection to an intra-marginal position, thus reducing effort. When applying this logic to Brazil, it is useful to remark that the margin of selection is actually multi-dimensional, since there exists a hierarchy of majors with vastly different minimum scores for selection. To the extent that the objective is to gain admission to the most selective course of study possible, few applicants are truly intra-marginal.

Effort is measured in multiple ways. In Brazil, one of the principal methods for improving one's score on the vestibular is to enroll in a "cursinho," a 6-12 month course offered by a private test preparation company. Both the PSEU and QSC ask about *cursinho*. Whether an individual took a *cursinho* to prepare for the vestibular is a measure of effort. As an alternative measure, we use the number of times that an individual attempted the vestibular. The PSEU also

asks about secondary school achievement and study effort. In the face to face interviews, subjects rated the intensity with which they studied during their final year of secondary school. The variable "high effort" equals one if the respondent selected the highest level of effort and equals zero otherwise. About 20% reported high effort. In both the face to face and internet surveys, subjects characterized their secondary school grades. The variable "high grades" equals one if the respondent reported that their grades were in the top two grade categories (mostly or nearly all 9's and 10's). About 20% had "high grades."

Table 9 analyzes the impact of the quota system on the likelihood that students had taken a *cursinho*. The coefficient on being a quota student is positive and significant in each of the first four columns. Specifically, being a quota student raises the likelihood of taking a *cursinho* by about 8 percentage points. However, the coefficient on being *pardo* after the implementation of quotas and the coefficient on being *preto* after the implementation of quotas are both insignificant. The coefficient on having dark skin tone after the implementation of quotas is insignificant as well. The results may imply that *pardos* who applied under the quota system were more likely to take a *cursinho*, while *pardos* who did not apply under the quota system when it was available were less likely. Shortly, we report less ambiguous evidence that quotas raised enrollment in *cursinho* among applicants to UnB.

Other variables relate to the likelihood of taking a course to prepare for the vestibular. Being female is positively associated with *cursinho*. Besides, women also had higher grades and study effort at UnB. Having a mother with less than secondary school education is negatively associated with *cursinho*. This may reflect the influence of socioeconomic status, as *cursinho* might be prohibitively costly for some disadvantaged students. Having attended a public secondary school is significantly associated with taking a *cursinho* perhaps because public

school quality is generally lower and its curriculum is less tailored to the college entrance exam. Performance on the vestibular is positive and significantly related to *cursinho*. This likely captures the causal effect of *cursinho* on exam scores as well as the positive selection of students into *cursinho* programs.

Table 10 focuses on the academic effort of students in secondary school. Being a quota student is not significantly related to either high effort or high grades. Nevertheless, the coefficient on having dark skin tone after the implementation of quotas is positive and significant. This suggests that the darkest 25% of students exhibited greater effort in their final year of secondary school following the enactment of racial quotas. Thus, it appears that the darkest quota students experienced a rise in effort, whereas less dark quota students did not. Human capital investments made prior to the announcement of the affirmative action policy were sunk, so it is critical to confirm that earlier investments are uncorrelated with the quota system. For this reason, we verify (not reported in the table) that having dark skin tone after the implementation of quotas is not significantly related to primary school grades.

Other variables relate to high effort and high grades in secondary school. Being female is positively associated with high effort and high grades, which is congruent with the findings that they are more likely to have enrolled in a *cursinho* and more likely to have exhibited high academic effort and performance in college. Socioeconomic measures are unrelated to high effort, but having a mother with less than secondary school education and having no domestic workers are both positive and significantly related to high grades. Interestingly, more disadvantaged students reported somewhat higher academic achievement in secondary school. Score on the vestibular is also positively associated with high effort and high grades either

because secondary school achievement raises success on the vestibular or because individuals with academic ability perform well both in secondary school and on the vestibular.

Table 11 examines effort in university admissions for applicants to UnB. When the dependent variable is taking a *cursinho*, the coefficient on quota status is positive and significant at the 10% level, and the coefficient on being *pardo* after the implementation of quotas is positive and significant as well. This helps to clarify the previously ambiguous evidence on *cursinho*. As before, being female, having attended a public secondary school, and score on the vestibular are positively associated with *cursinho*. Additionally, applicants from middle-class families (intermediate levels of household income and mother without a college degree) are significantly more likely to take a *cursinho*. In the last columns, the dependent variable is the number of times an applicant attempted the vestibular. About 60% attempted once, and about 90% attempted three times or fewer. The coefficients on both quota status and *pardo* after the implementation of quotas are positive and significant. Being *pardo* after the implementation of quotas increases the number of attempts by almost 0.2. Being female and score on the vestibular are positively related to the number of attempts. The number of attempts rises with mother's education and household income.

To summarize, there is no evidence that racial quotas at UnB reduced the pre-university effort of students or applicants. Indeed, some evidence exists suggesting that the policy may have raised effort. Quota students and applicants as well as *pardo* applicants after the implementation of quotas were more likely to take a *cursinho*. Dark-skinned students matriculating after the implementation of quotas were more likely to report high effort and grades in secondary school. Plus, quota and *pardo* applicants after quotas were more likely to attempt the vestibular multiple

times. These results make sense considering that the hierarchy of majors greatly diminishes the number of intra-marginal individuals for whom incentives to invest in effort are low.

Effects on Racial Identity

Quotas at UnB are for *negros*. Given the competitiveness of admissions, there is substantial incentive to self-identify as black to be able to apply under the quota system. Moreover, for individuals admitted as quota students, UnB provides an array of services reinforcing and fostering investments in black identity. Therefore, racial quotas at UnB may have caused some individuals at the margin to consider themselves black. In this context, marginal individuals are those in the middle of the racial continuum, i.e. *pardos* and others with intermediate skin tone. One of the main empirical challenges is to differentiate between actual racial change and misrepresentation. Although we rely on both the QSC and PSEU to measure racial identity, we believe that the PSEU better minimizes misrepresentation. PSEU respondents had little incentive to misrepresent themselves because they had already matriculated at UnB, were unaware of the research objectives, and were told that their responses were absolutely confidential.

Using the PSEU, Table 12 examines the effect of racial quotas on the racial identity of students. The dependent variable is whether a respondent considers him or herself *negro*. The regressions include controls for race, semester of matriculation, gender, socioeconomic status, and GPA. The coefficient on quota status is positive and significant in every specification. The coefficient on being *pardo* after the implementation of quotas is also positive and significant, while the coefficient on being *preto* after the implementation of quotas is not. Based on photos, having dark skin tone after the implementation of quotas is positive and significant as well.

Conditional on race/color and socioeconomic status, quota students are about 25 percentage points more likely to consider themselves *negro*. Being *pardo* in the post-quota era raises the likelihood of self-identifying as *negro* by almost 7 percentage points, an effect which is roughly 50% of the sample average for *pardos*. There is no effect on *pretos*, since nearly all *pretos* self-identified as black before and after quotas. The results may imply that quotas raised the likelihood that those students in the middle of the racial continuum, especially *pardos*, considered themselves *negro*. It is important to note that the coefficients on semesters 2-2003 and 1-2004 are not significant, which suggests that there was no trend in black identity prior to the implementation of quotas. Other variables are related to black identity. The estimated coefficients on mother's education, domestic workers, and public secondary school imply that socioeconomic status is inversely related to the likelihood that respondents consider themselves *negro*. Also, in three of six regressions, GPA is negatively associated with black identity.

Using the QSC, Table 13 looks at the racial identity of applicants. The dependent variable is whether a respondent considers him or herself *negro* upon registration for the vestibular. The coefficient on quota status is positive and significant. The coefficient on being *pardo* after the implementation of quotas is positive and significant, and albeit smaller in magnitude, the coefficient on being *preto* after the implementation of quotas is positive and significant as well. Conditional on race/color and socioeconomic status, quota applicants are almost 50 percentage points more likely to consider themselves *negro*. *Pardos* who register for the vestibular when quotas are available are about 30 percentage points more likely to have black identity, while *pretos* are about 3 percentage points more likely. Echoing the previous findings, the introduction of quotas appears to raise the likelihood that those at the margin, *pardos*, self-identify as *negro*. However, the estimated effects in Table 13 are much greater in magnitude than those in Table

12, perhaps because they are capturing both actual change in racial identity and misrepresentation, since the incentive to misrepresent one's identity is higher on the QSC. Analogous to Table 12, socioeconomic status is inversely associated with black identity. Being female and score on the vestibular are also negatively related to the likelihood of considering oneself *negro*. The coefficients on semester are significant, because with time the response rate of non-quota applicants on the QSC fell more rapidly than the response rate of quota applicants.

We are able to identify the effect of quotas on racial identification using the panel structure of the university admissions data, since a number of individuals took the vestibular multiple times. We focus on those applicants who registered for the vestibular before and after the implementation of affirmative action. There were about 5,000 such individuals. We regress change in black identity on all four interactions of black identity before the policy and quota status after the policy. Change in black identity is simply the difference between black identity after the implementation of quotas and black identity before. Alternatively, we regress black identity after implementation on quota status and black identity before implementation. The only "before" semester is 1-2004 when race questions were introduced into the QSC. Controls are from 1-2004. Table 14 displays the regressions. About 90% of those who did not consider themselves *negro* in 1-2004 and later applied under the quota system considered themselves negro after the implementation of quotas (N=536). In comparison, only 10% of those who did not consider themselves *negro* in 1-2004 and later did not apply under the quota system considered themselves *negro* after the implementation of quotas (N=3,257). About 2% of those who considered themselves *negro* in 1-2004 and later applied under the quota system no longer considered themselves *negro* after the implementation of quotas (N=1,045). Lastly, approximately 55% of those who considered themselves *negro* in 1-2004 and later did not apply

under the quota system no longer considered themselves *negro* after the implementation of quotas (N=513). These results (column 1) are qualitatively unchanged with the inclusion of controls for race, gender, mother's education, family income, and public school attendance (columns 2-3). Similarly, columns 4-6 reveal that, conditional on black identity before quotas and other controls, applying under the quota system raises the likelihood that an applicant considers him or herself black by more than 60 percentage points. Thus, looking at applicants who applied before and after the quota system provides additional evidence that self-reported black identity increased in response to the policy, which might reflect real change in identity, misrepresentation, or both.

Many of the students who participated in the PSEU also completed the QSC upon registration for the vestibular. They answered the same race questions at two different times, three to four years apart. Linking the PSEU and QSC, we are able to create a panel of students. We regress black identity in the PSEU on quota status, black identity in the QSC, race (*pardo*, etc.), semester of matriculation, socioeconomic status, and score on the vestibular. Regressions based on this dependent variable are effectively identical to those using the difference between *negro* on the PSEU and QSC but produce coefficients that are easier to interpret. We restrict the sample to *pardos* and *pretos*. Table 15 displays the findings. The coefficient on quota status is positive and significant in every regression. Conditional on black identity in the QSC, race, semester, and other covariates, being a quota student raises the likelihood that a student considers him or herself black by about 20 percentage points. Not surprisingly, the coefficient on *negro* in the QSC is positive and significant. The coefficient on the *pardo* indicator is negative, because relative to *pretos*, many fewer *pardos* considered themselves *negro*. The coefficient on 1-2004 is not significant, which indicates that there was no trend in black identity prior to the

implementation of the policy. However, the coefficients on matriculation in 2005 are negative and significant, implying that students who matriculated more recently are less likely to consider themselves black in the PSEU regardless of what they said on the QSC. Hence, an analysis of the link between the PSEU and QSC provides further support for the notion that quotas raised the likelihood that individuals considered themselves *negro*. These results point in the direction of real change in identity, since the PSEU minimizes the incentive to misrepresent one's racial identity.

In short, there is evidence that UnB's policy increased the likelihood that applicants and students self-identified as *negro*. Using the PSEU, which minimizes the incentive to misrepresent racial identity, difference-in-difference and panel specifications imply that the quota system may have inspired actual change in racial identity for students at the margin. Using the QSC, which is more susceptible to misrepresentation, analogous specifications yield larger estimated effects, which suggest that the quota system may have spurred both actual change and misrepresentation for applicants at the margin. These findings are consistent with the incentives engendered by the policy. Indeed, the incentive to apply under the quota system was significant given the competitiveness of admissions, and programs for quota students reinforced and fostered investments in identity. Therefore, racial identity may respond to incentives.

V. Conclusion

In this paper, we analyzed a policy that was part of the first-wave of affirmative action programs in Brazil. Understanding UnB's experience with racial quotas may help to improve existing programs and craft new ones. If the policy might involve race or skin tone, assigning preference in admissions to only the darkest students (*pretos*) might be more effective than the

current system. The findings in this paper suggest that the darkest students tend to be the poorest, and they are unlikely to experience changes in racial identity. However, if the policy might involve variables other than race or skin tone, assigning preference in admissions to students who were raised in families with low socioeconomic status might be an effective mechanism to reduce inequality. Given the selectivity of college admissions and the complex role of racial and socioeconomic factors that determine performance on the vestibular, any affirmative action policy solely at the university level may have only limited effects on society-wide poverty. That most students at UnB were more advantaged than the population is suggestive of this. It may be beneficial to have programs to improve the quality of public primary and secondary schooling, so that a greater number of students are able to have success on the vestibular. The findings also imply that policy makers designing other race-based affirmative action programs should be particularly aware of incentives that may impact racial identification.

The results in this paper contribute to the economics of affirmative action, race, and identity and raise a number of interesting questions. If racial quotas in higher education polarize racial identity in the short-run, what are the long-run effects? What are the implications for the marriage market and future patterns of economic inequality in Brazil? Future work may be able to address these issues, as well as explore the endogenous construction of racial identity, the effect of quotas on labor market outcomes, and the interaction between race and inequality.

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Figure 1
Distribution of Skin Tone, 2-2003

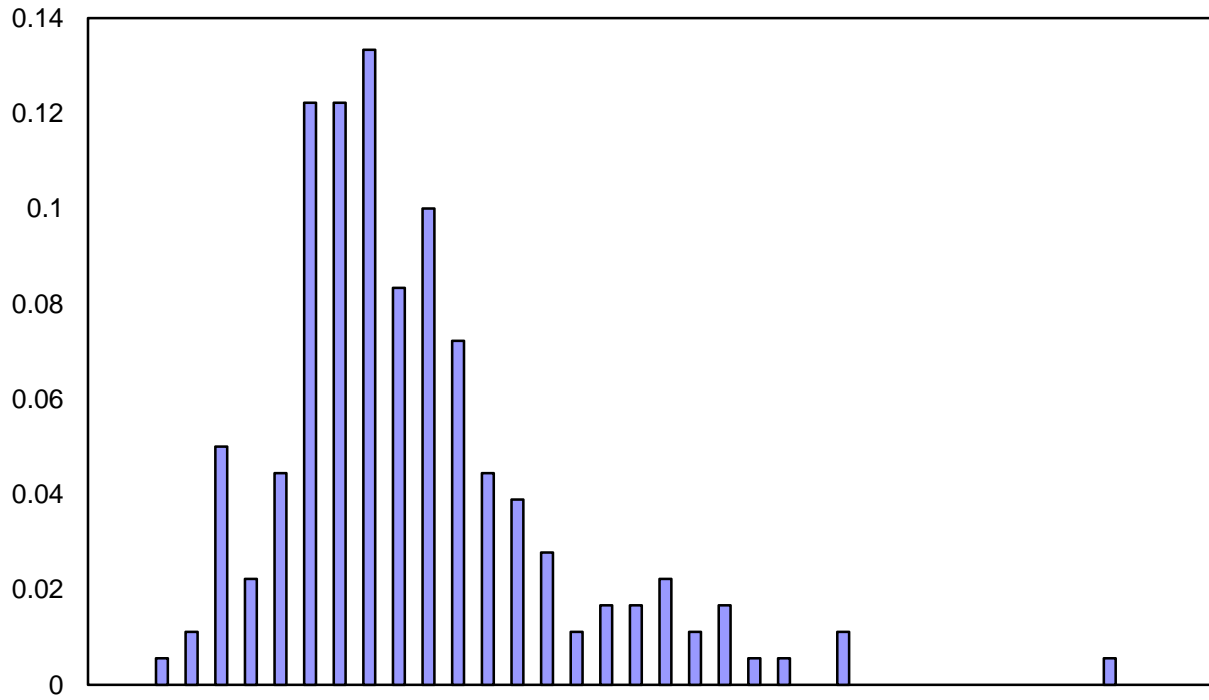


Figure 2
Distribution of Skin Tone, 2-2004

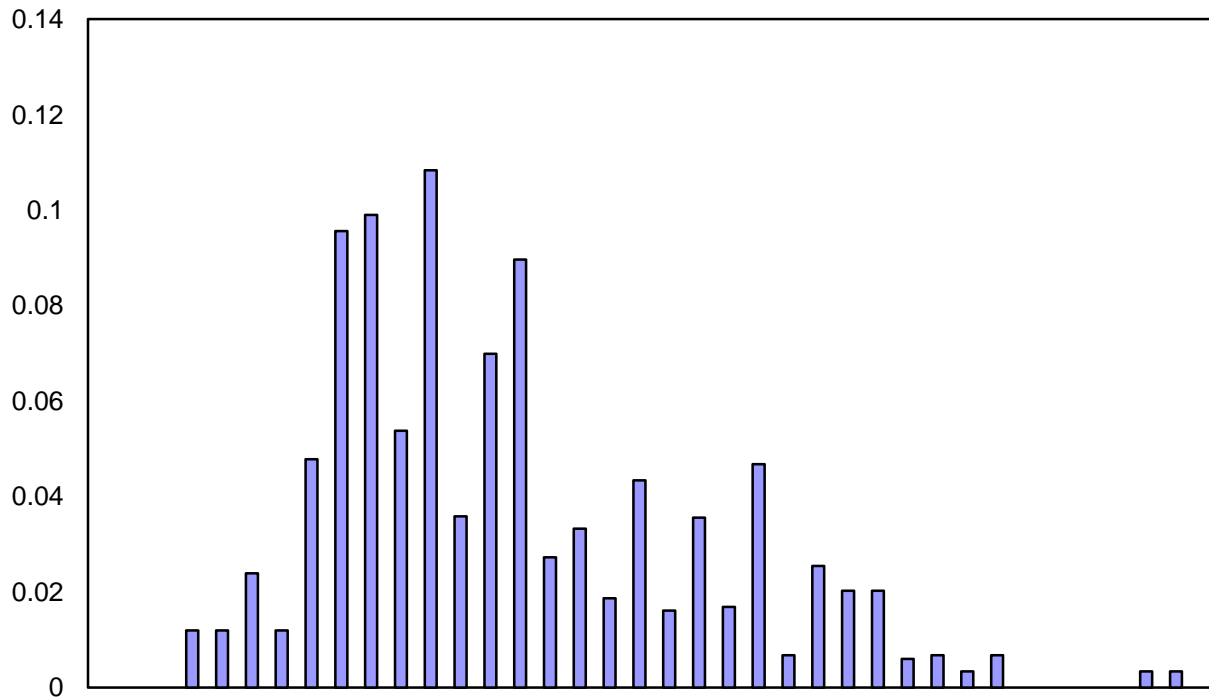


Figure 3
Distribution of Skin Tone, 2-2005

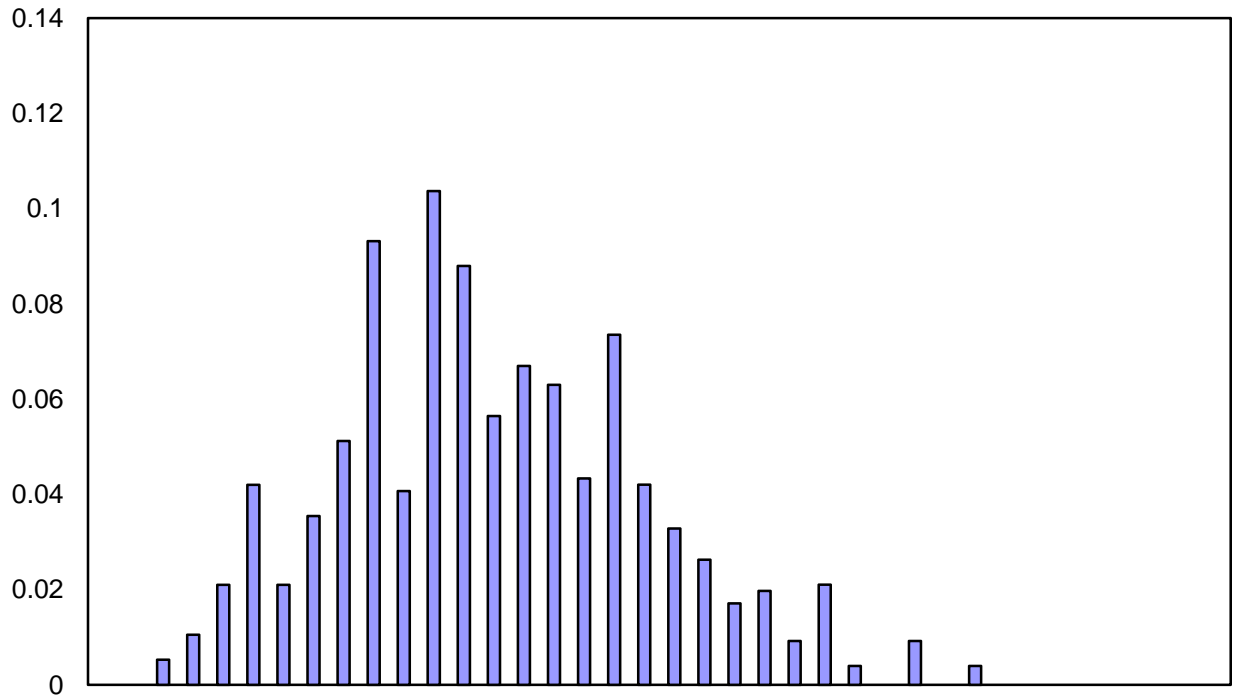


Table 1
Admissions Standards and Applicants by Department, 2-2004

Department	Non-quota admissions score (NQ)	Quota admissions score (Q)	# Non-quota applicants			# Quota applicants		
			Above NQ	Between NQ & Q	Below Q	Above NQ	Between NQ & Q	Below Q
Medicine	361.2	334.4	29	31	1876	4	3	212
Law	270	212.5	40	80	1566	5	5	412
Robotic Engineering	248.4	95.1	24	85	249	1	5	25
International Relations	221.7	180.7	32	33	711	3	5	47
Electrical Engineering	213.5	128	39	42	190	4	4	26
Engineering of Information	195	6.2	25	68	150	0	7	14
Computer Science	184.7	117.2	25	41	472	4	2	63
Biology	178.2	-30	27	148	277	1	6	41
Social Communication	174.4	66.2	55	164	893	2	11	134
Dentistry	167.9	23.8	19	55	246	2	2	27
Mechanical Engineering	161.9	69.4	35	47	206	3	5	25
Political Science	147.4	114.2	35	25	281	5	3	59
Economics	146.5	82.3	37	40	217	0	8	36
Pharmaceutical Science	146.3	94.3	27	30	287	0	6	32
Architecture	128.9	-0.4	26	82	154	0	6	13
Nutrition Science	126.5	-37.1	23	103	335	1	4	50
Industrial Design	124.8	20.9	16	51	78	0	4	8
Psychology	122.7	47.4	30	53	496	2	5	83
Physics	121.1	-28.3	24	63	85	1	6	12
Civil Engineering	107.7	-122.6	41	151	91	0	4	8
Veterinary Medicine	107.4	7.4	25	63	362	2	4	32
History	98.3	4.2	24	47	247	0	6	72
Business	87.3	36	45	40	402	6	4	61
Nursing	74.1	74.1	22	0	456	6	0	142
Language Translation	62.9	-75.9	24	99	116	1	4	24
Agronomy	60	-46.8	36	80	321	0	8	57
Statistics	57.4	25.7	20	10	134	1	4	16
Social Sciences	47.9	10.9	52	31	292	6	6	83
Forest Engineering	45.9	-5	34	28	250	0	8	48
Chemistry	45.4	-126.6	33	83	72	3	3	16
Portuguese	36.7	6.5	22	5	146	3	3	40
Physical Education	32.5	-24	33	35	644	3	5	180
Mathematics	26.3	-123.6	33	73	72	2	5	24
Geography	25.4	21.2	28	0	245	4	2	79
Accounting	23.7	16.2	34	5	276	7	2	60
Philosophy	15.9	-58.2	21	16	69	1	3	25
Geology	-8.8	-17.1	27	4	126	4	1	19
Social Work	-20.3	-22.4	24	0	246	5	1	68
Library Science	-40.9	-76.1	34	15	249	5	3	90
Fine Arts	-42.7	-81.5	24	12	103	5	1	13
Teaching	-48.2	-60.1	63	14	490	14	1	161
Performing Arts	-119.7	-119.7	15	0	24	1	0	6

NOTE. This table is based on complete admissions records from 2-2004. For individuals who applied under the general vestibular system, the non-quota admissions score (NQ) is the minimum score necessary for selection. For individuals who applied under the quota system, the quota admissions score (Q) is the minimum score necessary for selection. Departments are sorted by non-quota admission score. Some departments are omitted due to space constraints.

Table 2
Admissions Standards and Applicants by Semester

Semester	# Non-quota applicants			# Quota applicants			Selection rate %	
	Above NQ	Between NQ & Q	Below Q	Above NQ	Between NQ & Q	Below Q	Non-quota	Quota
2-2003	2183		21287				9.3	
1-2004	1167		20429				5.4	
2-2004	1734	2407	16855	162	225	3482	8.3	10.0
1-2005	895	328	13438	146	79	3521	6.1	6.0
2-2005	1708	699	16772	316	109	3452	8.9	11.0

NOTE. This table is based on complete admissions records aggregated over departments. For individuals who applied under the general vestibular system, the non-quota admissions score (NQ) is the minimum score necessary for selection. For individuals who applied under the quota system, the quota admissions score (Q) is the minimum score necessary for selection.

Table 3
Race and Socioeconomic Status

	Branços	Pardos	Pretos	Fisher's Exact Test
For 18-60 year olds living in Distrito Federal (PNAD)				
Respondent college education	24.2	8.4	6.4	** **
Family has computer	50.6	26.8	20.3	** ** *
Family has internet	44.2	19.5	15.0	** ** *
Family has refrigerator w/ freezer	55.0	37.9	32.9	** ** *
Family has washing machine	66.4	46.8	46.2	** **
Family home has only one bathroom	50.5	66.8	73.7	** ** *
Low family income (<= R\$ 750)	22.4	38.5	41.2	** **
High family income (> R\$ 5000)	28.9	12.2	9.6	** **
<i>N</i>	2997	3263	468	
For 15-24 year olds living in Distrito Federal (PNAD)				
Raised with both parents (%)	50.6	45.9	42.2	*
Father college education	24.6	11.8	6.5	** **
Mother college education	23.4	9.5	1.1	** ** *
Family has computer	55.8	29.3	18.6	** ** *
Family has internet	47.6	20.9	12.8	** ** *
Family has refrigerator w/ freezer	62.7	40.5	35.3	** **
Family has washing machine	71.5	49.7	40.2	** ** *
Family home has only one bathroom	47.6	63.8	76.5	** ** *
Low family income (<= R\$ 750)	22.1	38.8	38.2	** **
High family income (> R\$ 5000)	26.8	10.9	5.9	** **
<i>N</i>	660	846	102	
For students at UnB (PSEU/QSC)				
Raised with both parents (%)	74.1	74.5	68.0	** **
Father college education	64.5	46.4	30.4	** ** *
Mother college education	62.8	45.9	38.8	** ** *
Family has computer	94.5	89.5	86.3	** **
Family has internet	92.1	87.9	78.5	** ** *
Family has refrigerator w/ freezer	74.8	70.6	69.3	**
Family has washing machine	95.2	93.1	85.1	** ** *
Family home has only one bathroom	10.2	19.0	25.2	** ** *
No domestic workers at home	34.7	49.5	64.9	** ** *
Attended public secondary school	28.5	43.1	63.4	** ** *
Low family income (<= R\$ 750) QSC	8.3	15.2	23.5	** ** *
High family income (> R\$ 5000) QSC	38.2	23.4	15.0	** ** *
<i>N</i>	1,407	1,246	231	
For applicants to UnB (QSC)				
Low family income (<= R\$ 750)	16.6	27.9	39.6	** ** *
High family income (> R\$ 5000)	24.2	12.1	7.4	** ** *
Father college education	45.8	30.8	20.9	** ** *
Mother college education	45.8	31.5	20.9	** ** *
Attended public secondary school	38.5	55.1	68.9	** ** *
<i>N</i>	19,535	20,452	6,509	

NOTE. A double asterisk indicates significant difference in proportions at the 5% level, and a single asterisk indicates significance at the 10% level. The first column of asterisks refers to the comparison of *brancos* and *pardos*, the second refers to *brancos* and *pretos*, and the third refers to *pardos* and *pretos*. The sample of 15-24 year olds is restricted to those living with at least their mothers. Respondent college education is calculated for 24-60 year olds. Estimates are calculated using weights to adjust for the (slight) oversampling of quota students. Data source: PNAD, PSEU, and QSC.

Table 4
Racial Change at UnB

	Pre-quota		Post-quota	2-2003		2-2004		2-2005
<i>Self-identified race %</i>								
Branco	50.5	**	46.2	49.4	**	40.6	**	47.8
Pardo	40.8		42.2	41.3		43.7		41.9
Preto	5.3	**	8.3	6.0	**	11.8	**	6.7
Other	3.4		3.4	3.3		3.9		3.6

NOTE. A double asterisk indicates significant difference in proportions at the 5% level based on Fisher's Exact Test, and a single asterisk indicates significance at the 10% level. Estimates are calculated using weights to adjust for the (slight) oversampling of quota students. Data source: PSEU.

Table 5
Racial Composition of Quota Students/Applicants

Semester	Quota Students		Quota Applicants	
	Pardo %	Preto %	Pardo %	Preto %
2-2004	51.0	49.0	54.5	45.5
1-2005	77.5	22.5	68.6	31.4
2-2005	70.5	29.5	62.6	37.4

NOTE. Some quota students/applicants are neither *pardos* nor *pretos*, but the number is small. Data source: QSC and PSEU.

Table 6
Socioeconomic Change at UnB

	Pre-quota	Post-quota	2-2003	2-2004	2-2005
Raised with both parents (%)	76.3 **	72.7	78.3 **	70.8	74.6
Father college education	55.2	53.9	53.1	49.5 *	54.0
Mother college education	53.2	53.8	50.0	48.4 **	54.9
Family has computer	92.1	91.7	90.2	88.4 **	92.6
Family has internet	89.7	88.9	87.4	86.0	88.2
Family has car	90.9 *	89.2	89.6 **	84.8 **	90.1
Family has refrigerator w/ freezer	72.0	72.4	71.8	71.4	74.3
Family has washing machine	93.0	94.1	94.5	94.2	93.7
Family home has only one bathroom	14.3	16.0	17.0	19.1	15.0
No domestic workers at home	40.3 **	45.4	42.2 *	47.3	45.0
Four or more siblings	16.0	14.9	16.1	18.7 **	14.1
Attended public secondary school	36.8	37.9	40.9	42.7	39.8
Most classmates went to college	71.6 *	68.6	69.9 **	62.7 **	70.0
Parents source of college financing	65.2	66.9	62.5	61.2 **	67.8
Low family income (<= R\$ 750) QSC	12.4	13.2	11.8 *	16.5	12.7
High family income (> R\$ 5000) QSC	33.9 **	25.6	35.3 **	21.8	25.9

NOTE. A double asterisk indicates significant difference in proportions at the 5% level based on Fisher's Exact Test, and a single asterisk indicates significance at the 10% level. Estimates are calculated using weights to adjust for the (slight) oversampling of quota students. Data source: QSC and PSEU.

Table 7
Academic Performance of Quota Students at UnB

Variable	Dependent Variable: Grade Point Average			
	(1)	(2)	(3)	(4)
Quota student	-0.143 (0.025)**	-0.083 (0.026)**	-0.074 (0.036)**	-0.040 (0.041)
Female	0.321 (0.015)**	0.344 (0.017)**	0.313 (0.026)**	0.317 (0.026)**
Vestibular score		0.002 (0.000)**	0.002 (0.000)**	0.001 (0.000)**
Both parents			0.014 (0.027)	0.017 (0.028)
Mom less than sec sch			0.052 (0.040)	0.073 (0.040) *
Mom sec sch to some college			-0.037 (0.030)	-0.038 (0.030)
No domestic workers			0.039 (0.028)	0.045 (0.029)
Multiple domestic workers			-0.041 (0.040)	-0.047 (0.040)
Public secondary school			-0.024 (0.031)	-0.022 (0.031)
Pardo				-0.099 (0.028)**
Preto				-0.076 (0.052)
Asian				-0.042 (0.085)
Indigenous				-0.351 (0.096)**
N	7735	6215	2271	2253

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Columns 1-2 involve all students (universe). All regressions also include controls for semester and subject area. Data source: PSEU.

Table 8
Academic Effort of Quota Students at UnB

Variable	Dependent Variable: Effort at Unb			
	(1)	(2)	(3)	(4)
Quota student	0.145 (0.082) *	0.187 (0.082) **	0.137 (0.083)	0.062 (0.093)
Female	0.343 (0.056) **	0.268 (0.057) **	0.284 (0.058) **	0.276 (0.058) **
Grade Point Average		0.266 (0.048) **	0.272 (0.049) **	0.282 (0.049) **
Both parents			-0.007 (0.061)	0.004 (0.061)
Mom less than sec sch			-0.002 (0.088)	-0.022 (0.089)
Mom sec sch to some college			0.019 (0.065)	0.023 (0.065)
No domestic workers			0.051 (0.062)	0.048 (0.063)
Multiple domestic workers			-0.041 (0.089)	-0.043 (0.089)
Public secondary school			0.198 (0.066) **	0.194 (0.066) **
Pardo				0.055 (0.061)
Preto				0.188 (0.111) *
Asian				-0.249 (0.198)
Indigenous				0.198 (0.242)
N	2777	2777	2751	2726

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. All regressions include controls for semester and subject area. Data source: PSEU.

Table 9
Cursinho (UnB students)

Variable	Dependent Variable: Cursinho							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota student	0.080 (0.025)**	0.075 (0.025)**	0.082 (0.025)**	0.075 (0.025)**				
Pardo x after					-0.001 (0.038)	-0.010 (0.038)		
Preto x after					-0.065 (0.066)	-0.076 (0.066)		
Pardo	0.015 (0.019)	0.019 (0.019)	0.026 (0.019)	0.028 (0.019)	0.042 (0.032)	0.048 (0.031)		
Preto	0.002 (0.034)	0.003 (0.034)	0.021 (0.034)	0.030 (0.034)	0.119 (0.057)**	0.130 (0.057)**		
Asian	0.055 (0.062)	0.049 (0.063)	0.033 (0.063)	0.039 (0.063)				
Indigenous	-0.030 (0.068)	-0.038 (0.069)	-0.024 (0.070)	-0.018 (0.070)				
Dark x after							-0.100 (0.071)	-0.099 (0.070)
Dark							0.111 (0.063)*	0.107 (0.063)*
2-2003	-0.009 (0.024)	-0.014 (0.024)	-0.029 (0.024)	-0.022 (0.024)	-0.057 (0.031)*	-0.052 (0.031)*	-0.025 (0.038)	-0.013 (0.038)
1-2004	-0.071 (0.031)**	-0.075 (0.031)**	-0.089 (0.031)**	-0.083 (0.031)**	-0.116 (0.038)**	-0.111 (0.037)**	-0.165 (0.063)**	-0.146 (0.062)**
1-2005	-0.071 (0.029)**	-0.080 (0.029)**	-0.079 (0.029)**	-0.082 (0.029)**	-0.080 (0.029)**	-0.083 (0.029)**	-0.126 (0.052)**	-0.138 (0.052)**
2-2005	-0.021 (0.022)	-0.027 (0.022)	-0.017 (0.022)	-0.018 (0.022)	-0.023 (0.022)	-0.026 (0.022)	-0.008 (0.035)	-0.017 (0.035)
Female		0.062 (0.017)**	0.076 (0.017)**	0.075 (0.018)**	0.077 (0.017)**	0.075 (0.018)**	0.055 (0.028)**	0.057 (0.030)*
Both parents		0.002 (0.019)	-0.002 (0.019)	-0.004 (0.019)	0.001 (0.020)	-0.001 (0.019)	0.024 (0.033)	0.025 (0.034)
Mom less than sec sch		-0.083 (0.026)**	-0.063 (0.026)**	-0.067 (0.026)**	-0.061 (0.027)**	-0.064 (0.027)**	0.019 (0.041)	0.017 (0.042)
Mom sec sch to some college		0.003 (0.020)	0.014 (0.020)	0.012 (0.020)	0.020 (0.020)	0.018 (0.020)	0.017 (0.032)	0.014 (0.032)
No domestic workers		-0.007 (0.019)	0.002 (0.019)	0.003 (0.019)	0.003 (0.019)	0.004 (0.019)	-0.019 (0.031)	-0.020 (0.030)
Multiple domestic workers		-0.039 (0.029)	-0.041 (0.029)	-0.042 (0.029)	-0.041 (0.030)	-0.042 (0.030)	0.049 (0.043)	0.050 (0.044)
Public secondary school		0.044 (0.018)**	0.067 (0.019)**	0.076 (0.019)**	0.069 (0.019)**	0.079 (0.019)**	0.066 (0.030)**	0.074 (0.031)**
Vestibular score			0.001 (0.000)**	0.000 (0.000)**	0.001 (0.000)**	0.000 (0.000)**	0.000 (0.000)**	0.000 (0.000)
Subject areas	No	No	No	Yes	No	Yes	No	Yes
N	2268	2244	2244	2244	2169	2169	705	705

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Data source: PSEU.

Table 10
Effort in Secondary School (UnB students)

Variable	Dependent Variable							
	High Effort (binary)				High Grades (binary)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota student	-0.026 (0.044)	-0.022 (0.044)			-0.018 (0.027)	-0.013 (0.027)		
Pardo	0.033 (0.034)	0.034 (0.034)			-0.001 (0.019)	0.000 (0.019)		
Preto	0.023 (0.056)	0.017 (0.057)			0.002 (0.035)	0.001 (0.035)		
Asian	-0.151 (0.084) *	-0.148 (0.082) *			-0.026 (0.068)	-0.029 (0.068)		
Indigenous	0.053 (0.118)	0.058 (0.124)			-0.022 (0.060)	-0.024 (0.059)		
Dark x after			0.153 (0.068) **	0.151 (0.069) **			0.135 (0.061) **	0.130 (0.062) **
Dark			-0.139 (0.059) **	-0.134 (0.060) **			-0.108 (0.051) **	-0.103 (0.052) *
2-2003	0.014 (0.043)	0.009 (0.044)	0.033 (0.047)	0.027 (0.047)	-0.032 (0.025)	-0.034 (0.025)	-0.034 (0.043)	-0.037 (0.043)
1-2004	0.018 (0.054)	0.015 (0.054)	0.060 (0.061)	0.055 (0.062)	-0.014 (0.029)	-0.015 (0.029)	0.013 (0.055)	0.010 (0.054)
1-2005	0.050 (0.053)	0.056 (0.054)	0.047 (0.053)	0.053 (0.054)	0.022 (0.029)	0.023 (0.029)	0.010 (0.051)	0.018 (0.052)
2-2005	0.005 (0.041)	0.010 (0.041)	0.009 (0.040)	0.015 (0.041)	-0.004 (0.023)	-0.002 (0.023)	-0.024 (0.037)	-0.016 (0.038)
Female	0.120 (0.029) **	0.115 (0.031) **	0.128 (0.030) **	0.122 (0.033) **	0.080 (0.017) **	0.078 (0.017) **	0.068 (0.028) **	0.061 (0.029) **
Both parents	-0.003 (0.034)	-0.007 (0.035)	0.001 (0.035)	-0.003 (0.036)	0.006 (0.019)	0.008 (0.019)	-0.001 (0.033)	-0.004 (0.033)
Mom less than sec sch	0.079 (0.049)	0.083 (0.049) *	0.080 (0.051)	0.082 (0.051)	0.082 (0.027) **	0.082 (0.027) **	0.132 (0.051) **	0.137 (0.051) **
Mom sec sch to some	0.022 (0.036)	0.024 (0.036)	0.024 (0.036)	0.025 (0.037)	-0.014 (0.020)	-0.015 (0.020)	-0.003 (0.034)	-0.003 (0.034)
No domestic workers	0.002 (0.035)	0.001 (0.035)	0.020 (0.035)	0.020 (0.035)	0.058 (0.019) **	0.059 (0.019) **	0.088 (0.032) **	0.086 (0.032) **
Multiple domestic workers	0.021 (0.052)	0.022 (0.053)	0.040 (0.053)	0.039 (0.054)	0.050 (0.029) *	0.049 (0.029) *	0.018 (0.047)	0.011 (0.047)
Public secondary school	0.025 (0.037)	0.026 (0.038)	0.015 (0.037)	0.018 (0.038)	-0.003 (0.019)	-0.007 (0.020)	-0.012 (0.032)	-0.003 (0.033)
Vestibular score	0.001 (0.000) **	0.001 (0.000) **	0.001 (0.000) **	0.001 (0.000) **	0.001 (0.000) **	0.001 (0.000) **	0.001 (0.000) **	0.001 (0.000) **
Subject areas	No	Yes	No	Yes	No	Yes	No	Yes
N	778	778	733	733	2251	2251	737	737

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Data source: PSEU.

Table 11
Effort in Secondary School (applicants)

Variable	Dependent Variable							
	Cursinho				Number of Vestibular Attempts			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota applicant	0.011 (0.010)	0.018 (0.010) *			0.175 (0.029)**	0.190 (0.028)**		
Pardo x after			0.032 (0.015)**	0.029 (0.015) *			0.189 (0.041)**	0.184 (0.041)**
Preto x after			-0.035 (0.025)	-0.028 (0.025)			-0.070 (0.068)	-0.052 (0.068)
Pardo	0.048 (0.008)**	0.046 (0.008)**	0.028 (0.013)**	0.029 (0.013)**	0.160 (0.022)**	0.154 (0.022)**	0.069 (0.035)**	0.072 (0.035)**
Preto	0.027 (0.013)**	0.036 (0.013)**	0.059 (0.022)**	0.067 (0.021)**	0.041 (0.036)	0.062 (0.036) *	0.193 (0.057)**	0.210 (0.057)**
Asian	0.031 (0.018) *	0.032 (0.017) *	0.031 (0.018) *	0.032 (0.017) *	0.011 (0.048)	0.013 (0.048)	0.012 (0.048)	0.013 (0.048)
Indigenous	0.108 (0.036)**	0.112 (0.035)**	0.109 (0.035)**	0.114 (0.035)**	0.108 (0.107)	0.116 (0.104)	0.128 (0.107)	0.138 (0.105)
No race response	0.069 (0.012)**	0.057 (0.011)**	0.069 (0.012)**	0.057 (0.011)**	0.333 (0.032)**	0.307 (0.032)**	0.334 (0.032)**	0.308 (0.032)**
1-2004	-0.090 (0.008)**	-0.091 (0.008)**	-0.085 (0.010)**	-0.088 (0.010)**	-0.111 (0.022)**	-0.114 (0.022)**	-0.089 (0.026)**	-0.096 (0.026)**
1-2005	-0.001 (0.009)	-0.004 (0.009)	-0.001 (0.009)	-0.003 (0.009)	0.224 (0.026)**	0.216 (0.025)**	0.236 (0.025)**	0.229 (0.025)**
2-2005	0.062 (0.009)**	0.064 (0.009)**	0.061 (0.009)**	0.063 (0.009)**	-0.373 (0.027)**	-0.370 (0.027)**	-0.376 (0.027)**	-0.372 (0.027)**
Female	0.069 (0.007)**	0.084 (0.007)**	0.069 (0.007)**	0.084 (0.007)**	0.232 (0.018)**	0.265 (0.018)**	0.234 (0.018)**	0.266 (0.018)**
Mom college edu	-0.004 (0.007)	-0.017 (0.007)**	-0.004 (0.007)	-0.017 (0.007)**	0.128 (0.020)**	0.100 (0.020)**	0.127 (0.020)**	0.098 (0.020)**
Family income (<750	-0.044 (0.013)**	-0.010 (0.013)	-0.044 (0.013)**	-0.009 (0.013)	-0.425 (0.036)**	-0.349 (0.036)**	-0.421 (0.036)**	-0.346 (0.036)**
Family income (750-2	0.056 (0.010)**	0.080 (0.010)**	0.056 (0.010)**	0.080 (0.010)**	-0.322 (0.028)**	-0.270 (0.028)**	-0.319 (0.028)**	-0.267 (0.028)**
Family income (2500	0.032 (0.010)**	0.046 (0.010)**	0.032 (0.010)**	0.046 (0.010)**	-0.139 (0.027)**	-0.109 (0.027)**	-0.138 (0.027)**	-0.108 (0.027)**
Family income (don't	0.041 (0.012)**	0.055 (0.012)**	0.040 (0.012)**	0.054 (0.012)**	0.019 (0.034)	0.049 (0.034)	0.020 (0.034)	0.051 (0.034)
Public secondary sch	0.066 (0.008)**	0.077 (0.008)**	0.067 (0.008)**	0.078 (0.008)**	-0.047 (0.021)**	-0.024 (0.021)	-0.038 (0.021) *	-0.015 (0.021)
Vestibular score		0.001 (0.000)**		0.001 (0.000)**		0.002 (0.000)**		0.002 (0.000)**
Subject areas	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	24189	24189	24189	24189	24252	24252	24252	24252

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Data source: QSC.

Table 12
Black Identity (UnB students)

Variable	Dependent Variable: Black Identity							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota student	0.242 (0.029)**	0.245 (0.029)**	0.245 (0.029)**	0.251 (0.029)**				
Pardo x after					0.065 (0.029)**	0.067 (0.028)**		
Preto x after					-0.022 (0.018)	-0.022 (0.020)		
Pardo	0.155 (0.013)**	0.137 (0.013)**	0.136 (0.013)**	0.132 (0.013)**	0.141 (0.022)**	0.137 (0.022)**		
Preto	0.806 (0.023)**	0.764 (0.024)**	0.764 (0.024)**	0.756 (0.025)**	0.935 (0.014)**	0.931 (0.016)**		
Asian	-0.024 (0.008)**	-0.037 (0.012)**	-0.037 (0.012)**	-0.030 (0.012)**				
Indigenous	0.233 (0.070)**	0.189 (0.068)**	0.187 (0.068)**	0.180 (0.069)**				
Dark x after							0.180 (0.084)**	0.191 (0.083)**
Dark							-0.002 (0.087)	0.001 (0.086)
2-2003	0.009 (0.018)	0.005 (0.018)	0.005 (0.018)	0.004 (0.018)	-0.016 (0.017)	-0.017 (0.017)	-0.001 (0.040)	0.009 (0.040)
1-2004	-0.005 (0.021)	-0.008 (0.020)	-0.008 (0.020)	-0.008 (0.020)	-0.024 (0.018)	-0.025 (0.018)	-0.063 (0.043)	-0.049 (0.043)
1-2005	-0.025 (0.021)	-0.028 (0.021)	-0.028 (0.021)	-0.029 (0.021)	-0.019 (0.023)	-0.019 (0.023)	-0.075 (0.046)	-0.065 (0.046)
2-2005	-0.042 (0.017)**	-0.041 (0.017)**	-0.042 (0.017)**	-0.044 (0.017)**	-0.036 (0.018)**	-0.038 (0.018)**	-0.114 (0.034)**	-0.112 (0.034)**
Female		-0.015 (0.012)	-0.012 (0.012)	-0.022 (0.013)*	-0.012 (0.013)	-0.021 (0.013)	0.093 (0.026)**	0.083 (0.027)**
Both parents		0.002 (0.014)	0.002 (0.014)	0.004 (0.014)	0.001 (0.014)	0.001 (0.014)	-0.031 (0.029)	-0.043 (0.029)
Mom less than sec sch		0.059 (0.021)**	0.060 (0.021)**	0.056 (0.021)**	0.063 (0.022)**	0.060 (0.022)**	0.070 (0.043)	0.067 (0.044)
Mom sec sch to some college		-0.001 (0.014)	-0.001 (0.014)	-0.004 (0.014)	0.007 (0.015)	0.005 (0.015)	0.030 (0.029)	0.035 (0.029)
No domestic workers		0.025 (0.014)*	0.026 (0.014)*	0.023 (0.014)*	0.027 (0.014)*	0.025 (0.014)*	0.043 (0.030)	0.039 (0.030)
Multiple domestic workers		0.013 (0.018)	0.012 (0.018)	0.016 (0.017)	0.006 (0.018)	0.009 (0.018)	0.021 (0.039)	0.029 (0.039)
Public secondary school		0.054 (0.015)**	0.054 (0.015)**	0.043 (0.015)**	0.056 (0.016)**	0.046 (0.016)**	0.017 (0.032)	0.015 (0.032)
GPA			-0.006 (0.010)	-0.016 (0.010)	-0.011 (0.010)	-0.022 (0.011)**	-0.043 (0.022)**	-0.059 (0.022)**
Skin tone							0.033 (0.003)**	0.032 (0.003)**
Subject areas	No	No	No	Yes	No	Yes	No	Yes
N	2281	2248	2248	2248	2173	2173	705	705

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Data source: PSEU.

Table 13
Black Identity (applicants)

Variable	Dependent Variable: Black Identity							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quota applicant	0.480 (0.005)**	0.477 (0.005)**	0.497 (0.007)**	0.497 (0.007)**				
Pardo x after					0.283 (0.009)**	0.284 (0.009)**	0.300 (0.012)**	0.300 (0.012)**
Preto x after					0.051 (0.007)**	0.048 (0.007)**	0.031 (0.010)**	0.030 (0.010)**
Pardo	0.350 (0.004)**	0.342 (0.004)**	0.331 (0.006)**	0.330 (0.006)**	0.293 (0.007)**	0.278 (0.007)**	0.248 (0.010)**	0.248 (0.010)**
Preto	0.637 (0.005)**	0.626 (0.005)**	0.628 (0.008)**	0.628 (0.008)**	0.899 (0.006)**	0.877 (0.006)**	0.890 (0.009)**	0.890 (0.009)**
Asian	0.068 (0.007)**	0.060 (0.007)**	0.053 (0.009)**	0.053 (0.009)**	0.077 (0.007)**	0.062 (0.007)**	0.052 (0.009)**	0.053 (0.009)**
Indigenous	0.345 (0.022)**	0.335 (0.022)**	0.333 (0.035)**	0.334 (0.035)**	0.420 (0.024)**	0.406 (0.024)**	0.393 (0.037)**	0.393 (0.037)**
No race response	0.111 (0.006)**	0.106 (0.006)**	0.089 (0.007)**	0.089 (0.007)**	0.122 (0.006)**	0.114 (0.006)**	0.092 (0.007)**	0.093 (0.007)**
1-2004	0.085 (0.004)**	0.083 (0.004)**	0.068 (0.005)**	0.068 (0.005)**	0.072 (0.004)**	0.071 (0.004)**	0.073 (0.005)**	0.073 (0.005)**
1-2005	0.050 (0.004)**	0.051 (0.004)**	0.073 (0.005)**	0.073 (0.005)**	0.084 (0.004)**	0.087 (0.005)**	0.116 (0.006)**	0.116 (0.006)**
2-2005	0.097 (0.004)**	0.098 (0.004)**	0.112 (0.006)**	0.112 (0.006)**	0.105 (0.005)**	0.107 (0.005)**	0.114 (0.007)**	0.113 (0.007)**
Female		-0.012 (0.003)**	-0.015 (0.004)**	-0.015 (0.004)**		-0.009 (0.003)**	-0.011 (0.004)**	-0.011 (0.005)**
Mom college edu		-0.004 (0.003)	-0.006 (0.004)	-0.006 (0.004)		-0.012 (0.004)**	-0.011 (0.005)**	-0.011 (0.005)**
Family income (<750)		0.036 (0.006)**	0.045 (0.008)**	0.046 (0.009)**		0.044 (0.006)**	0.054 (0.009)**	0.055 (0.009)**
Family income (750-2500)		0.020 (0.005)**	0.010 (0.006)*	0.011 (0.006)*		0.029 (0.005)**	0.018 (0.006)**	0.019 (0.006)**
Family income (2500-5000)		0.007 (0.005)	0.001 (0.005)	0.002 (0.005)		0.011 (0.005)**	0.005 (0.006)	0.006 (0.006)
Family income (don't know)		0.027 (0.006)**	0.023 (0.007)**	0.024 (0.007)**		0.031 (0.007)**	0.029 (0.008)**	0.030 (0.008)**
Public secondary school		0.018 (0.004)**	0.017 (0.005)**	0.017 (0.005)**		0.038 (0.004)**	0.040 (0.005)**	0.041 (0.005)**
Vestibular score			-0.000 (0.000)**	-0.000 (0.000)**			-0.000 (0.000)**	-0.000 (0.000)**
Subject areas	No	No	No	Yes	No	No	No	Yes
N	48169	47503	23971	23971	48169	47503	23971	23971

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Data source: QSC.

Table 14
Change in Black Identity in QSC (applicants)

Variable	Dependent Variable					
	Change in Black Identity in QSC			Negro After Quota System		
	(1)	(2)	(3)	(4)	(5)	(6)
Not negro before + quota after	0.899 (0.013)**	0.895 (0.021)**	0.851 (0.022)**			
Not negro before + not quota after	0.101 (0.005)**	0.098 (0.017)**	0.078 (0.017)**			
Negro before + quota after	-0.021 (0.004)**	-0.034 (0.017)*	-0.110 (0.022)**			
Negro before + not quota after	-0.548 (0.022)**	-0.559 (0.027)**	-0.615 (0.029)**			
Quota applicant after				0.682 (0.013)**	0.681 (0.013)**	0.659 (0.014)**
Negro before (1-2004)				0.231 (0.014)**	0.223 (0.015)**	0.196 (0.016)**
Pardo			0.062 (0.013)**			0.080 (0.013)**
Preto			0.098 (0.019)**			0.077 (0.019)**
Asian			0.008 (0.020)			0.020 (0.021)
Indigenous			0.093 (0.043)**			0.088 (0.043)**
No race response			0.057 (0.017)**			0.071 (0.017)**
Female		-0.027 (0.009)**	-0.026 (0.009)**		-0.026 (0.009)**	-0.024 (0.009)**
Mom college edu		-0.016 (0.010)	-0.013 (0.010)		-0.012 (0.011)	-0.009 (0.011)
Family income (<750)		0.023 (0.016)	0.018 (0.016)		0.027 (0.017)	0.021 (0.017)
Family income (750-2500)		0.015 (0.014)	0.010 (0.014)		0.020 (0.014)	0.013 (0.014)
Family income (2500-5000)		0.011 (0.014)	0.007 (0.014)		0.012 (0.014)	0.006 (0.014)
Family income (don't know)		0.032 (0.018)*	0.026 (0.018)		0.033 (0.019)*	0.026 (0.019)
Public secondary school		0.012 (0.010)	0.009 (0.010)		0.010 (0.011)	0.008 (0.011)
Subject areas	No	Yes	Yes	No	Yes	Yes
N	5351	5257	5229	5351	5257	5229

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Change in identity is *negro* in QSC after the quota system minus *negro* in QSC before the quota system. Race and socioeconomic controls are from 1-2004. Data source: QSC.

Table 15
Change in Black Identity between QSC and PSEU (UnB students)

Variable	Dependent Variable: Negro in PSEU		
	(1)	(2)	(3)
Quota student	0.239 (0.053) **	0.205 (0.050) **	0.201 (0.049) **
Negro in QSC	0.347 (0.050) **	0.203 (0.049) **	0.200 (0.049) **
Pardo		-0.412 (0.039) **	-0.417 (0.040) **
1-2004		0.036 (0.050)	0.035 (0.050)
1-2005		-0.135 (0.048) **	-0.145 (0.047) **
2-2005		-0.166 (0.038) **	-0.169 (0.038) **
Female		-0.052 (0.031) *	-0.052 (0.032)
Both parents		0.012 (0.035)	0.005 (0.035)
Mom less than sec sch		0.049 (0.043)	0.052 (0.043)
Mom sec sch to some college		-0.045 (0.038)	-0.038 (0.037)
No domestic workers		0.047 (0.036)	0.055 (0.036)
Multiple domestic workers		0.055 (0.062)	0.057 (0.061)
Public secondary school		0.053 (0.039)	0.053 (0.039)
Vestibular score		-0.001 (0.000) **	-0.001 (0.000) **
Subject areas	No	No	Yes
N	648	571	571

NOTE. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level. Sample is limited to *pardos* and *pretos*. Data source: QSC and PSEU.