Voluntary Disclosure and the Strategic Behavior of Colleges

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Abstract: This paper investigates how outside ranking organizations such as *U.S. News and World Report* affect colleges' admission decisions. To do so, we focus on a policy that has received criticism for being motivated by ranking concerns: optional reporting of SAT I scores. This policy allows colleges to report an average SAT I score that may not be reflective of actual student body quality but instead of the quality of those students who chose to submit their scores. We use proprietary data from two liberal arts colleges to address how the optional reporting policy affects the colleges' admission decisions as well as how students' SAT I scores influences their decision to submit these scores to the colleges. The data suggest that college admission departments are behaving strategically by more (less) likely accepting applicants who do not submit their SAT I scores if submitting their scores would decrease (increase) the average SAT I score the colleges report to the ranking organizations. The data also suggest that students are behaving strategically by choosing not to reveal their SAT I scores if they are below a value one might predict based on their other observable characteristics.

> Whether they get 1300 or 1250 doesn't really tell you anything about them as a person or a student" says Ken Himmelman, Bennington dean of admissions. All the attention to numbers "becomes so crazy it's almost a distraction."
>
> - Bruno in *USA Today* (2006)

> "I SOMETIMES think I should write a handbook for college admission officials titled "How to Play the U.S. News & World Report Ranking Game, and Win!" I would devote the first chapter to a tactic called "SAT optional."
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> The idea is simple: tell applicants that they can choose whether or not to submit their SAT or ACT scores. Predictably, those applicants with low scores or those who know that they score poorly on standardized aptitude tests will not submit. Those with high scores will submit. When the college computes the mean SAT or ACT score of its enrolled students, voilà! its average will have risen. And so too, it can fondly hope, will its status in the annual U.S. News & World Report's college rankings."
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> Colin Driver, President of Reed College, *New York Times, 2006*

> There's almost a schizophrenia in college admissions," says Dan Lundquist, vice president and dean of admissions at New York's Union College.
>
> "There's this mercenary instinct to put your colleges at the best possible advantage. At the same time, most of us are educators who are against that kind of crude positioning."
>
> Nowhere is that clash of values more evident than in how administrators view their favorite whipping boys, the U.S. News & World Report college guide and the SAT. If one could find a way to use the test they love to hate to improve their standing in the rankings they love to hate, the result might prove irresistible.
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> Brownstein in *The Chronicle of Higher Education* (2001)

I. Introduction

Policies that mandate full disclosure of information, such as food ingredients and business quality measures, are designed to increase the well-being of consumers. The theoretical literature debates whether voluntary disclosure is necessary to achieve this goal. The seminal game theoretic models of voluntary disclosure suggest that if revealing private information is voluntary and slightly costly, only those with the worst outcomes will withhold their information: the "unraveling" equilibrium (Grossman and Hart, 1980). All others will reveal their information to avoid the assumption that they have extremely low outcomes, such that mandatory disclosure may not be efficient.

Recent mandates have been passed requiring firms' disclosure of information in numerous product markets ranging from alcohol content to health care provider evaluations to restaurant hygiene scores. An increasing number of colleges[1] are moving in an opposite direction from the product markets by making the reporting of standardized test scores, such

[1] As of Spring 2007, more than 700 colleges have such policies in place (http://www.fairtest.org/optinit.htm), although many are religious or technical schools.

as the SAT I (the two-part standardized verbal and math test)[2], voluntary. The list of these schools includes 24 of the top 100 liberal arts colleges ranked by *U.S. News & World Report*, a publication that has circulation of more than 2 million every year (Selingo, 2007, http://chronicle.com/free/v53/i38/38a01501.htm). This policy gives us an ideal setting for testing not only the theoretical implications of the voluntary disclosure literature but also whether school's admission decisions are influenced by a school's incentive to increase their rankings in publications such as *U.S. News and World Report*.

As the quotes at the start of the paper suggest, the adoption of these optional SAT policies is extremely controversial. The adopting schools often argue that the test score differentials in the SAT are not a result of aptitude differences but rather biases in the test that favor particular groups. For example, when University of California President Richard C. Atkinson announced his recommendation that the university no longer include the SAT I test as a requirement he stated, "[T]hat a perception among ethnic minority groups that the SAT I is unfair cannot be easily dismissed[.]" (University of California 2001). Therefore, allowing students to withhold their scores increases the likelihood that a more diverse pool of students will apply to their school.

Critics of these policies suggest that the policies are an attempt to increase the school's ranking. For those schools that implement an optional SAT policy, the mean SAT score the school reports to the ranking organizations is computed based not on the entire student body but only on the scores from those students who chose to submit. If students with higher SAT scores are more likely to submit, an optional SAT policy will increase the average SAT score the school reports to the ranking organizations.[3]

Brownstein (2001) in *The Chronicle of Higher Education* describes it this way:

> The thesis, first stated last year by The New Republic, is that colleges are being less than honest about why they abolish requirements that applicants submit their SAT

[2] The SAT I is now a three part exam that includes a writing portion. However, the years in our data included only the two parts.

[3] An optional SAT policy may also affect the pool of applicants which is likely to influence schools' rankings by changing their acceptance and yield rates.

> scores. Behind the rhetoric about "enhancing diversity" and creating a more "holistic approach" to admissions, the theory goes, many colleges "go optional" on the SAT to improve their rankings. The logic is rather simple: At an SAT-optional college, students with higher scores are far more likely to submit them, raising the institution's mean SAT score and hence the heavily test-influenced rankings.

Levin (2002) suggests that "[I]n an effort to boost their selectivity rankings some schools have dropped the SAT requirement for admission; other schools may be tempted to admit more students with high SATs [page 8]." A survey of 241 schools conducted by the Association of Governing Boards found that 51 percent of schools reported attempting to increase their rankings in the *U.S. News and World Report* (Levin, 2002) and there are many anecdotal reports of efforts to boost rankings (see, for example, Ehrenberg, 2002).

The rankings provided by publications such *U.S. News and World Report* have received considerable attention. In addition to being widely read and considered influential among higher income students (Levin. 2002), there is evidence that spending per pupil and objective measures of college quality are positively correlated with improvements in rankings (Jin and Whalley, 2007 and Monks and Ehrenberg, 1999). The formulaic rankings provide incentives to maximize the revealed quality of students. Mechanically, SAT scores make up 40 percent of the student selectivity ranking category of the *U.S. News and World Report* rankings.

Using the admissions data from two colleges with an optional SAT I policy, we find evidence that these colleges are behaving strategically in their admission decisions in an effort to improve their school's ranking. The data suggest that, ceteris paribus, the college is more likely to accept applicants who do not submit their SAT I scores if submitting their scores would decrease the average SAT I score the colleges report to the ranking organizations. However, the college is less likely to accept applicants who do not submit their SAT I scores if submitting their scores would increase their reported average SAT I score. Perhaps not surprisingly, we do not find evidence of complete unraveling. Instead, we find a large share of applicants choose not to reveal their SAT 1 scores. In addition, we show that

students are behaving strategically by choosing not to reveal their SAT I scores if their actual scores are below a value one might predict based on their other observable characteristics.

Section II describes the data and specific optional SAT policies from two liberal arts colleges while section III summarizes the voluntary disclosure literature. Section IV presents evidence that colleges are acting strategically to increase a student quality measure (average SAT I scores) reported to the ranking organizations and applicants are acting strategically when deciding whether to submit their SAT I score. Section V concludes.

II. Data and Institutional Details

Our primary data come from two schools in the north east, each with approximately 1800 students enrolled.[4] Both report a typical SAT I score in the upper 1200s (out of 1600 and relative to a mean score for all persons taking the SAT I of approximately 1020 (College Board, 2002)). For College X, we have two recent years of data, about five years into the school's optional SAT policy. For College Y, we have one recent year of data, the first year that the school instituted the program.

For each student, our primary source is all the details from the applications that were entered into the admissions' databases. Of course, we know whether or not students chose to submit their SAT I scores. More generally, the data contain characteristics of the applicants, including SAT II and ACT scores for those who submit them, race, sex, high school GPA, legacy status and zip code of residence. In addition, it includes characteristics of the high school such as type (private or public), high school name, and state. The dataset also contains the admissions decision made on the student, accept or not[5], and whether they enroll in the college. These data are similar across the colleges.

[4] We signed agreements with the colleges and College Board to allow us to use the data. This agreement stipulates that we cannot reveal the names of the colleges.

[5] We drop the students who withdrew before an acceptance decision was made – the reduced form results are similar with and without these observations.

One crucial variable that is often missing from the college admissions data is the SAT scores for the applicants who chose not to submit their SAT scores. Although the college obtains these data for a minority of students, particularly those who ultimately enroll, we purchased a data match of SAT scores from the College Board to identify SAT I scores for the remainder. We drop the international students from our analysis primarily because obtaining a match with the College Board data is very low due to the lack of social security numbers.[6] Finally, we exclude students who withdrew from consideration before admission decisions were made, which is about 13 percent from College X and 5 percent from College Y. The College Board data also includes SAT II scores[7], AP test scores, and responses to the student descriptive questionnaire (SDQ) that is filled out at the time the students take their SATs. This includes self-reported data on family income as well as high school activities, awards, grades[8], and class rank.

While both Colleges X and Y allow applicants to choose whether to submit their SATI scores, they do differ in terms of what other scores are submitted. Whether or not they submit their SAT I scores, College X requires applicants to submit either their ACT scores or three SAT II scores. Along with their SAT I scores, applicants at College Y can elect to submit scores from their SAT II exams, ACT exam, and/or Advanced Placement (AP) exams[9]. College Y applicants are required to submit at least one of these scores if they choose not to submit their SAT I scores.[10]

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[6] We also drop fewer than 2 percent of domestic students for whom we cannot identify an SAT I score.
[7] There are 20 different SAT II: Subject Tests and not all students take these exams. As a "uniform" measure for those who take at least one SAT II exam, we create an "average SAT II score", which is the average of up to three SAT II scores from either the college data base or the College Board match. Each test is out of 800 points.
[8] As an alternative measure of academic preparedness, high school GPA has the potential to be crucial in analyzing student and college behavior. Unfortunately, GPA scales as reported on applications are not even remotely standardized across high schools and therefore comparisons are extremely difficult (see Chaker, 2003). College Y did not even record high school GPA for many of their applicants in their admissions data. We contacted as many high schools as possible and asked them for their GPA scales but the resulting data were extremely complicated, giving us little confidence in their usefulness.
[9] There are 35 AP exams available, administered through the College Board. While it is not required, most students take a year long AP course in high school before taking the exam (see http://www.collegeboard.com/prod_downloads/student/testing/ap/AP-bulletin.pdf accessed 4/16/07).
[10] Based on the data, a few applicants appear not to have satisfied these requirements.

For College X, 15 percent of the 6,567 applicants chose not to submit their SAT I scores, while 24 percent of the 3,504 applicants from College Y chose not to submit their SAT I scores. Overall, Table 1 describes the colleges' admissions pools and the differences in those that chose to submit their SAT I scores and those who did not. Perhaps not surprisingly, the average SAT I score is less for students who do not submit their score, by an average of 133 points for College X and 38 points for College Y. Figure 1 depicts the distributions of SAT I scores at College X and Y for those who submit and do not submit their scores. It indicates that not only is the average SAT I score greater for those who submit but the variance of SAT I scores is also greater compared to those who do not submit.

Table 1 also indicates that for those with SAT II scores, the average SAT II score is higher at College X for applicants that submit their SAT I scores but not at College Y. At both colleges, the average ACT scores are similar for those who submit and do not submit their SAT I scores. Between one-third and one-half of applicants attended private high schools. More than 65 percent of applicants are female at College X, while around 50 percent are female at College Y. Those that attended private high schools and woman are more likely not to submit their SAT I scores and the fraction that submit does not appear to depend on self reported high school grade point averages. Applicants at both schools are from the high end of the income distribution. Conditional on reporting a family income, and many do not, income greater than $100,000 is the most common response. While small fractions of applicants at both schools are legacies and apply early decision, slightly more than half indicate that they intend to apply for financial aid. More than 83 percent of all applicants are white and more than three-quarters are from the northeast United States, including the states where the colleges reside.

III. Literature Review

A. Theoretical Literature

The economic theory of voluntary disclosure suggests that, if disclosure is costless, mandatory disclosure is not necessary to solve the problem of asymmetric information between two parties. This theory implies that even with voluntary disclosure, all individuals (or firms) will have an incentive to reveal their private information to avoid the other party assuming that their decision to withhold information implies worse than their actual private information. Grossman and Hart (1980) formalize this "unraveling" equilibrium.[11] Grossman (1981) generalizes the results in Grossman and Hart (1980) and considers voluntary disclosure of a product's quality. Milgrom (1981) also generalizes the results by considering voluntary disclosure of an array of information (i.e., voluntary disclosure along multiple dimensions instead of a single dimension). Similar to Grossman and Hart, Milgrom proves that, in every sequential equilibrium, the informed party fully discloses all private information when disclosure is costless. With costly disclosure, Jovanovic (1982) identifies an equilibrium where unraveling occurs but the unraveling is not complete. Specifically, the equilibrium is such that an individual will voluntary disclose if this private information is above some "quality" threshold and will not reveal if it is below this threshold.[12, 13]

All of the theoretical papers mentioned above model the environments as standard Bayesian Games and make common assumptions in terms of the informational structure. Specifically, they all assume common knowledge. In addition, all of the models assume that the beliefs on the uniformed party's type conditional on not revealing are based on Bayesian updating. Eyster and Rabin (2005) present an interesting equilibrium concept where each player correctly predicts the distribution of the other players' actions, but underestimates the

[11] They present this "unraveling" equilibrium in the context of the Security and Exchange Commission requiring parties to a takeover bid to disclose particular information instead of allowing voluntary disclosure while outlawing false statements.
[12] Jovanovic applies the model to an environment where a business chooses whether or not to disclose its product's quality and proves that it may not be socially-optimal to mandate disclosure.
[13] Shavell (1994) contributes to the voluntary disclosure literature by endogenizing a party's decision to acquire the private information.

degree these actions are correlated with these other players' private information. They term this equilibrium concept a "cursed equilibrium" and provide anecdotal evidence that this concept explains many empirically observed phenomena (including the winner's curse). Eyster and Rabin apply this concept to voluntary disclosure games to explain why everyone might not disclose their information even when disclosure is costless.

When applying these models to the voluntary disclosure of SAT I scores, we are concerned that there is not common knowledge and that the schools do not use Bayesian updating to infer the expected SAT I scores for applicants who do not submit their scores. Common knowledge may not exist because the applicants have limited experience applying to colleges and the data for College Y are from the first year the school instituted the optional SAT I policy. Furthermore, as we discuss in the introduction, the colleges' incentives to admit an applicant is not only a function of the SAT I scores but may also be a function of whether the applicant submits these SAT I scores. This could be due to concerns about reported quality to ranking institutions or because not submitting may reveal information on other characteristics of applicants, besides their actual SAT I scores, which are of concern to the college.

B. Empirical Literature

The data demands of testing for unraveling are extensive and have limited the empirical testing of the model. In particular, the ideal data include information about whether the private information is revealed and, if it is not, what that private information is. In practice, these data are rarely available.

Mathios (2000) shows that before mandatory disclosure laws, foods with the least healthy ingredients, as measured ex-post to mandatory disclosure, were the ones that did not report their ingredients. For example, 100 percent of the dressings with fewer than 6 grams of fat per serving voluntarily disclosed this information on the label, while only 9 percent of

the salad dressing with more than 13 grams of fat per serving voluntarily disclosed this fat content. He suggests that this is evidence of unraveling, but not complete unraveling because many of the salad dressings with ex-post intermediate amounts of grams of fat per serving also did not disclose their ingredients. One shortcoming in the data is that there are no ex-ante measures of ingredients. He also shows that consumers change their behavior following the mandatory disclosure rule and sales of ex-ante non-disclosing salad dressings with relatively low amounts of fat go up, while sales for those who did not label and had relatively high amounts of fat go down. If the mandatory disclosure laws did not cause the manufacturers to change fat content, these results suggest that consumers incorrectly inferred the fat content for those salad dressings that did not disclose.

Jin and Leslie (2003) test the implications of the voluntary disclosure models using information on an ordinance that Los Angeles County passed in December 1997 requiring restaurants to publicly display grade cards and, at the same time, began distributing standard form hygiene quality grade cards to all restaurants in Los Angeles, California. However, for the ordinance to apply to a restaurant located in a specific city, that city council must vote to adopt the ordinance. Cities chose to adopt this ordinance at different times. Those cities that adopted the ordinance mandated the posting of the hygiene report card while restaurants in cities where the ordinance was not adopted could voluntarily display their hygiene report card. Prior to December 1997, when revelation of hygiene reports was voluntary and the standard form report cards were not distributed, no restaurant revealed their grade. Post 1997, Jin and Leslie find that restaurant hygiene quality improved similarly in both the mandatory and voluntary jurisdictions which is consistent with the notion that unraveling may have occurred in the voluntary jurisdictions. Jin and Leslie are careful to note that many of the restaurants in the "voluntary" jurisdictions may have viewed their voluntary status as only temporary because most jurisdictions were adopting mandatory status. They also find

evidence that overall hygiene went up following the mandatory disclosure laws, suggesting that mandatory disclosure may have a beneficial effect on consumers.

Jin (2004) considers individual HMOs' decisions to reveal a measure of quality. In the case of HMOs, the quality measures are: (1) obtaining accreditation from the National Committee of Quality Assurance; and/or (2) receiving summary statistics from the Health Plan Employer Data and Information Set. The quality of HMOs who do not obtain these measures is unknown. Therefore, she cannot comment on the quality distribution of those who voluntary disclose compared to those that do not. Instead, her focus is primarily on other testable implications of the basic voluntary disclosure theory. She finds evidence that the level of competition in the market affects disclosure decisions, namely that HMOs in highly competitive markets have stronger incentives to differentiate via disclosure.

Although they do not focus on the unraveling hypothesis, Robinson and Monks (2005) look at the voluntary disclosure of SAT I scores in the first year of the policy at Mount Holyoke College. Using a select sample of non-submitters for whom they have SAT I scores (48 percent of non-submitters, most of whom enrolled), they show that non-submitters have average SAT I scores that are lower (by 141 points) than submitters and that those who do not submit perform relatively poorly on the test relative to their other qualities. They also conclude that students who do not submit their scores have an advantage in the admissions process.

Our paper is most similar to Robinson and Monks in that we have the private information for those who do not disclose. While Robinson and Monks have this information for primarily those who enroll at Mount Holyoke, we have this information for those who enroll and do not enroll in College X and College Y. Our paper differs from theirs in terms of the primary question we are interested in addressing. While they focus on who decides not to disclose and how well the school's admissions department

can infer the SAT I score for these applicants, we are most interested in whether the school's admission decisions are influenced by ranking organizations. To properly address this question, we also document which types of applicants choose not to disclose. These disclosure results are qualitatively similar to those of Robinson and Monks but use a different identification strategy and more complete information on not only the SAT I scores for those applicants who did not disclose but also on all applicants' high school performance and activities.

IV. College's and Applicants' Strategic Behavior

A. Colleges' Admission Decisions

Ehrenberg (2005) and others argue that the intense competition for students among colleges is magnified by the *U.S. News and World Report's* ranking of schools and this ranking encourages colleges to implement policies designed to manipulate the rankings. As mentioned in the introduction, a survey conducted by the Association of Governing Boards suggested that many schools' decisions are influenced by an attempt to increase their rankings in the *U.S. News and World Report.*[14] The potential benefit in terms of the rankings associated with implementing an optional SAT I policy is evident from Table 2. For both colleges, the table shows that not only is the probability of acceptance greater for applicants who do not submit their SAT I scores (thereby potentially increasing the college's yield rate) but the average SAT I score for those that enroll is also greater for those that submit. Assuming that the optional SAT I policy does not affect the applicant pool, the college's acceptance decisions or the applicants' enrollment decisions, this policy would increase the

[14] During the time period of our data, *US News and World Report* using the following criteria and weights for rankings colleges: Student Selectivity 15%, Academic reputation (survey of other colleges) 25%, Faculty resources 20%, Graduation and retention rate 20%, Financial resources (expenditure per student) 10%, Alumni giving (rate) 5%, and Graduation rate performance 5%. Under the Student Selectivity criterion, the weights associated with the different selectivity rankings are SAT/Act scores 40%, Acceptance Rate 15%, Yield 10% and High school class standing top ten percent 35%.

average SAT I score reported to *U.S. News and World Report* from 1,255 to 1,281 for College X and from 1,279 to 1,299 for College Y. While our data set does not allow us to test whether the applicant pool or the enrollment decisions change as the result of the optional SAT I policy, it does allow us to test whether the colleges' acceptance decisions are influenced by ranking concerns.

The first and third columns of Table 3 present the coefficient estimates of a probit regression that regresses whether an applicant is accepted on his/her actual SAT I score (whether the applicant submitted the score or not), whether the applicant submitted her SAT I score, whether the applicant submitted his/her SAT II (ACT) score, the actual SAT II (ACT) score if the candidate submitted it, whether the applicant applied early decision, and a set of ability and demographic measures. The college is likely to have knowledge on these ability and demographic measures from each candidate's application. The actual SAT I score is positively and statistically significantly related to the probability of acceptance. Recall that the school does not observe the actual SAT I for those who don't submit it.

The coefficient on whether the student submitted his/her score is negative and statistically significant for College X and College Y. If schools are correctly inferring the actual SAT I scores of those who do not submit, we might expect this coefficient to be zero, all else equal. The negative sign may indicate that schools are overestimating the actual scores of those who didn't submit. This seems unlikely for College X in particular, given that they have a few years of experience with the policy. Another possibility is that the decision to NOT submit your SAT I score is correlated with the error term in some way that is reflected in a higher probability of being accepted. For example, perhaps these students are more mature in some way. We consider this possibility later when we analyze the students' subsequent performance.

It is also possible that this negative sign reflects strategic behavior on the part of the school. We consider this further in the second and fourth columns when we interact whether

the applicants submit their SAT I scores with their actual SAT I Score/100. The positive and statistically significant coefficients on the interaction suggest that the negative effect of reporting your SAT I score on the probability of being accepted decreases with the SAT I score. This is consistent with the premise that the admission departments are behaving strategically to favor those applicants who do not submit their SAT I scores, unless their scores are particularly high so submitting them would increase the average SAT score the school reports to the ranking organizations.

The specification estimated and the interpretation of the coefficient estimates in Table 3 are based on the assumption that the schools are correctly inferring the actual SAT I scores of those who do not submit. Now suppose that the colleges are naively inferring that the SAT I scores of those who do not submit are the "predicted" scores based on the applicants other observables.[15] To obtain a measure of this "predicted" score, we first regress the SAT I scores for applicants who submitted their scores on the set of applicant characteristics observable to the college (the regression results are in Appendix Table A1). We then use the coefficient estimates from this regression and the applicants' observables to "predict" SAT I scores for those who did **not** submit their SAT I scores. The predicted test scores, where the averages are shown in Table 2, for those who did NOT submit are substantially above their actual SAT I scores. For College X, the average predicted SAT I scores is 1,219 versus an actual average of 1,139, while for College Y the average predicted SAT I score is 22 points higher than the actual average (1,251 versus 1,229) and these means are statistically different than one another at standard levels.

The coefficient estimates shown in Table 4 are based on the same specification as in Table 3 except when constructing the set of independent variables, we use the predicted SAT I scores, rather than the actual scores, for those applicants that do not submit. By comparing

[15] This is in the spirit of Eyster and Rabin's "cursed" equilibrium where the school believes that an applicant's action (i.e. whether to submit his/her SAT I scores) is uncorrelated with the applicant's private information (i.e., his/her actual SAT score).

the SAT I related coefficient estimates in Table 3 with those in Table 4, it is evident that, while the coefficient estimates do change, the main conclusions drawn from these estimates change little if we assume schools naively infer instead of perfectly infer the non-submitters SAT I scores.

The point estimates in Table 4 (associated with whether the applicants submit their SAT I score and the SAT I interaction term) suggest that, ceteris paribus, applicants who do not submit their SAT I score are more likely to be accepted by College X if their SAT I score is less than 1,392 and are less likely to be accepted if their score is greater than 1,392. For College Y, applicants who do not submit their SAT I score are more likely to be accepted if their SAT I score is less than 1,272 and are less likely to be accepted if their score is greater than 1,272. Taking into account that the average SAT I score for those who submit is approximately 1,270 for both colleges, these results suggest that the colleges' admission departments are behaving strategically by more (less) likely accepting applicants who do not submit their SAT I scores if submitting their scores would decrease (increase) the average SAT I score the colleges report to the ranking organizations.

Table 3 also shows that other measures of academic ability, such as SAT II scores, ACT scores and high school GPAs are positively correlated with the probability of acceptance. Those that attended private high schools, legacies, and those who apply early decision are also more likely to be accepted, all else equal. Colleges reduce uncertainty about their yield with early decision applicants and these applicants are more likely to be admitted (See Avery et al. 2003, Kim, 2006, and Lee, 2002). Some of the other coefficients reflect diversity goals. For example women are less likely to be accepted at College X where more than 65 percent of applicants are women. College X is also more likely to accept applicants with lower income. In both schools, racial minorities are more likely to be

accepted. Individuals from the Midwest are more likely to be accepted by College X and individuals from the South are more likely to be accepted by College Y, all else equal.[16]

The earlier estimates suggest that withholding your SAT I scores is positively correlated with the probability of acceptance. One possible explanation is that there is additional information contained in the decision to withhold SAT I scores which we, and perhaps the schools, do not observe. Table 5 shows that deciding to submit SAT I scores is positively correlated with freshman GPA, but these coefficients are not economically significant nor statistically significant. As the coefficient estimates indicate, SAT I scores are positively correlated with freshman GPA (see Rothstein, 2004). SAT II scores, which are more curriculum based, are positively correlated for both College X and College Y, as are high school GPAs. Women consistently perform better and minorities consistently perform worse, all else equal.

B. Applicants' Voluntary Disclosure Decisions

Table 2 provides evidence that at least a set of applicants are behaving strategically by not submitting their SAT I scores when their actual scores are below the scores the college's may infer based on the other information on their applications. As mentioned above, the "predicted" SAT I score (based on observables- see Table A1) for those who did **not** submit are, on average, 80 and 22 points higher than their actual score for College X and College Y, respectively. Figure 2 shows the complete distribution of the difference between these predicted SAT I score and the actual SAT I score for those who do not submit at College X and College Y. The majority of data points are to the right of zero, meaning that their predicted scores are higher than their actual scores.

In Table 6, we provide additional evidence that some applicants are behaving strategically when deciding whether to submit their SAT I scores. The table presents the coefficient estimates of a probit regression that regresses whether an applicant submits his/her SAT I scores on the same set of ability and demographic measures as in Table 3. The

[16] The coefficient estimates when the independent variables associated with SAT I scores are based on the predicted instead of actual scores for those who do not submit are similar to those in Table 3.

coefficient estimates in Table 6 suggest that, ceteris paribus, applicants with higher SAT I scores are less likely to choose NOT to submit their score. However, applicants with higher alternative measures of academic ability, like SAT II scores and high school GPAs are more likely to choose NOT to submit their score, all else equal. Some of the correlates suggest that students who are better informed may be more likely to NOT submit their SAT scores. For example, students from private high schools are more likely to NOT submit their SAT I scores and African Americans applicants to College X are less likely to NOT submit their SAT scores. Perhaps due to the cost of submitting their scores, women applicants are more likely to NOT submit their SAT scores, conditional on those scores. This cost includes not only the explicit cost of reporting but also the psychological costs if applicants have some moral objections to reporting their SAT I scores. Perhaps these psychological costs depend on the applicant's perception of whether the SAT is fair and this perception depends on the applicant's gender.[17] There are numerous claims that the standardized SAT exams are biased against certain demographic groups including women.[18]

While these results suggest that some applicants are behaving strategically when choosing whether to submit their SAT I scores, they do not provide much insight in terms of why so many applicants do not submit. The theoretical models of voluntary disclosure predicts that almost all applicants will submit if the cost of disclosure is relatively nominal – as we expect it is for the majority of applicants. We suspect that one explanation why 15.3 percent of applicants to College X and 24.1 percent to College Y do not disclose is because some applicants are poorly informed in terms of how the colleges make admission decisions. Other possible explanations are that applicants believe the colleges will incorrectly infer their actual SAT I scores if they do not submit them or the colleges' incentives to admit an

[17] FairTest, the National Center for Fair & Open Testing, cites admissions staff members who indicate that some college applicants do not report their test scores for "philosophical reasons" (page 19) or as a "show of support" (page 23) for the school's policy (Rooney and Schaeffer 1998). For evidence that women and men compete differently, see Vesterlund and Niederle (2007).

[18] For research that considers whether the SAT exams are biased, see Major et al., 1998; Schmader, Major, and Gramzow, 2001; Steele, 1999; Lawlor et al. 1997; Rooney 1998; Bridgeman and Lewis 1996; Ramos and Lambating 1996; Wainer and Steinberg 1992; Wright et al. 1996.

applicant is not only a function of their actual SAT I scores but also a function of whether the applicant submits (perhaps due to concerns about reported quality to ranking institutions).

V. Conclusions

Schools are intentionally introducing uncertainty into their information set about students' applicants through voluntary SAT I policies. College admission data matched with confidential data from the College Board allows us to show that applicants who under-perform on the standardized test relative to their other observables are most likely to take advantage of the policy. More importantly, we find evidence that this voluntary disclosure policies allow schools an opportunity to behave strategically when making admission decisions in an effort to improve their school's ranking.

The correlates with which applicants are choosing to withhold their SAT I scores suggest that the applicants are acting strategically in ways that are not consistent with the colleges' stated goal of increasing economic and social diversity. Specifically, applicants from private high schools who are non-minorities are more likely to take advantage of the policy, all else equal. It is also possible that these same applicants are responding to incentives in the admissions process. We find that both colleges are more (less) likely to accept applicants who do not submit their SAT I scores if submitting their scores would decrease (increase) the average SAT I score the colleges report to ranking organizations like *U.S. News and World Report.*

The decisions to make SAT I scores optional appear particularly paradoxical in light of increased reliance on standardized testing including the estimated $500 million per year test preparation industry (Eduventures, 2004) and President Bush's education reform agenda that includes the *No Child Left Behind* Act of 2001 (http://www.nochildleftbehind.gov/), which requiring states to develop a grade by grade standardized testing system as measures of

accountability.[19] The empirical results in this paper suggests that SAT I scores do provide additional information on how the applicant will perform in college. By choosing to implement an optional SAT policy, these colleges must perceive the benefit of this policy on the college's ranking to be greater than the cost associated with forgoing the additional information on the applicants contained in their SAT I scores.

[19] The intention of the Act is to equalize education for all students, as measured by eliminating the achievement gap among socioeconomic groups. Test score differences are one measure of achievement gaps.

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Table 1
Summary Statistics: Means and Standard Deviations

	College X N=6,567			College Y N=3,504		
	Chose to Submit SAT I	Chose Not to Submit SAT I	SS	Chose to Submit SAT I	Chose Not to Submit SAT I	SS
SAT I Combined (math+verbal) Score	1272	1139		1267	1229	
	(124)	(116)	***	(144)	(120)	***
SAT I Verbal Score	641	570		633	610	
	(74)	(67)	***	(84)	(68)	***
SAT I Math Score	632	569		634	619	
	(70)	(67)	***	(78)	(72)	***
SAT II Score(s) available (1=yes)	0.856	0.815		0.677	0.804	
	(0.351)	(0.388)	***	(0.468)	(0.398)	***
Average SAT II Score (when available)	633	590		632	632	
	(68)	(68)	***	(76)	(61)	
ACT Score(s) available (1=yes)	0.015	0.013		0.200	0.141	
	(0.122)	(0.112)		(0.400)	(0.348)	***
Average ACT Score (when available)	24.6	23.7		26.6	26.1	
	(3.7)	(2.4)		(3.8)	(3.3)	
Attended Private HS	0.477	0.503		0.353	0.431	
	(0.500)	(0.500)		(0.478)	(0.495)	***
Female Student	0.657	0.778		0.487	0.548	
	(0.475)	(0.416)	***	(0.500)	(0.498)	***
No High School GPA reported (sr)	0.259	0.237		0.340	0.327	
	(0.438)	(0.425)		(0.474)	(0.469)	
HS GPA A+ (sr)	0.042	0.029		0.065	0.040	
	(0.201)	(0.169)	*	(0.247)	(0.197)	***
HS GPA A (sr)	0.155	0.180		0.176	0.146	
	(0.362)	(0.384)	*	(0.381)	(0.353)	**
HS GPA A- (sr)	0.227	0.228		0.167	0.193	
	(0.419)	(0.420)		(0.373)	(0.395)	*
HS GPA B+ (sr)	0.186	0.174		0.139	0.191	
	(0.389)	(0.379)		(0.346)	(0.393)	***
HS GPA B (sr)	0.103	0.121		0.086	0.088	
	(0.304)	(0.326)	*	(0.280)	(0.283)	
HS GPA B- (sr)	0.022	0.025		0.021	0.012	
	(0.148)	(0.155)		(0.144)	(0.108)	*
HS GPA C or below (sr)	0.006	0.006		0.007	0.005	
	(0.075)	(0.077)		(0.082)	(0.069)	
N	5550	1017		2659	845	

SS, statistical significance ; *** statistically different at 1% level, ** statistically different at 5% level, * statistically different at 10% level. (sr) indicates self reported and # of HS extracurricular activities, sports, offices/awards and honors classes are based on responses of those who filled in College Board Survey.

Table 1 (continued)
Summary Statistics: Means and Standard Deviations

	College X (N=6,567)			College Y (N=3,504)		
	Chose to Submit SAT I	Chose Not to Submit SAT I	SS	Chose to Submit SAT I	Chose Not to Submit SAT I	SS
Class rank missing	0.304	0.332		0.348	0.380	
	(0.460)	(0.471)	*	(0.477)	(0.486)	*
Class rank 1st 10th	0.225	0.195		0.212	0.182	
	(0.417)	(0.396)	**	(0.409)	(0.386)	
Class rank 2nd 10th	0.193	0.200		0.135	0.137	
	(0.395)	(0.400)		(0.342)	(0.344)	
Class rank 2nd 5th	0.112	0.121		0.073	0.090	
	(0.316)	(0.326)		(0.260)	(0.286)	*
Class rank middle or bottom	0.167	0.152		0.232	0.211	
	(0.373)	(0.360)		(0.422)	(0.408)	
Income Missing (sr)	0.456	0.464		0.559	0.559	
	(0.498)	(0.499)		(0.497)	(0.497)	
Income <50K (sr)	0.090	0.109		0.076	0.097	
	(0.287)	(0.312)	*	(0.264)	(0.296)	**
50K <Income <100K (sr)	0.182	0.189		0.159	0.129	
	(0.386)	(0.392)		(0.366)	(0.335)	**
Income >100K (sr)	0.271	0.238		0.206	0.215	
	(0.445)	(0.426)	**	(0.404)	(0.411)	
Legacy (1=yes)	0.024	0.022		0.062	0.053	
	(0.153)	(0.146)		(0.242)	(0.225)	
Apply Early	0.059	0.120		0.108	0.097	
	(0.235)	(0.325)		(0.311)	(0.296)	
Intend to Apply for Financial Aid	0.499	0.515		0.594	0.505	
	(0.500)	(0.500)		(0.491)	(0.500)	
White	0.835	0.834		0.877	0.859	
	(0.371)	(0.372)		(0.328)	(0.348)	
African American	0.029	0.031		0.032	0.049	
	(0.168)	(0.175)		(0.175)	(0.215)	**
Native American	0.003	0.007		0.002	0.002	
	(0.052)	(0.083)	**	(0.043)	(0.049)	
Asian American	0.043	0.041		0.054	0.041	
	(0.202)	(0.199)		(0.226)	(0.199)	
Hispanic	0.037	0.046		0.035	0.047	
	(0.190)	(0.210)		(0.185)	(0.212)	
Unknown Race	0.053	0.040				
	(0.224)	(0.197)	*			
N	5550	1017		2659	845	

SS, statistical significance ; *** statistically different at 1% level, ** statistically different at 5% level, * statistically different at 10% level. (sr) indicates self reported and # of HS extracurricular activities, sports, offices/awards and honors classes are based on responses of those who filled in College Board Survey.

Table 1 (continued)
Summary Statistics: Means and Standard Deviations

	College X N=6,567			College Y N=3,504		
	Chose to Submit SAT I	Chose Not to Submit SAT I	SS	Chose to Submit SAT I	Chose Not to Submit SAT I	SS
From State where College resides	0.134	0.122		0.335	0.254	
	(0.340)	(0.327)		(0.472)	(0.436)	***
From Northeast	0.627	0.589		0.498	0.568	
	(0.484)	(0.492)		(0.500)	(0.496)	***
From Midwest	0.051	0.084		0.046	0.044	
	(0.220)	(0.277)	**	(0.210)	(0.205)	
From West	0.088	0.094		0.075	0.063	
	(0.283)	(0.293)		(0.263)	(0.243)	
From South	0.100	0.111		0.047	0.071	
	(0.301)	(0.314)		(0.211)	(0.257)	***
Filled in College Board Survey	0.877	0.898		0.803	0.826	
	(0.329)	(0.303)	*	(0.398)	(0.379)	
# of HS Extracurricular Activities (sr)	5.419	5.410		4.690	4.540	
	(3.059)	(3.024)		(3.231)	(3.276)	
# of HS sports (sr)	2.428	2.543		2.308	2.340	
	(1.964)	(1.989)		(1.977)	(2.011)	
# of HS offices/awards (sr)	1.061	1.090		0.988	0.850	
	(1.474)	(1.510)		(1.506)	(1.364)	**
# of HS honors classes (sr)	4.128	3.323		3.669	3.590	
	(4.522)	(4.127)	***	(4.584)	(4.462)	
N	5550	1017		2659	845	

SS, statistical significance ; *** statistically different at 1% level, ** statistically different at 5% level, * statistically different at 10% level. (sr) indicates self reported and # of HS extracurricular activities, sports, offices/awards and honors classes are based on responses of those who filled in College Board Survey.

TABLE 2 : Additional Descriptive Statistics
Means
(standard deviations)
[number of observations]

	College X			College Y		
	Chose to Submit SAT I	Chose Not to Submit SAT I	SS	Chose to Submit SAT I	Chose Not to Submit SAT I	SS
SAT I Score (1600) – all applicants	1272 (124) [5550]	1139 (116) [1017]	***	1267 (144) [2659]	1229 (120) [845]	***
Probability of Acceptance	.418 (0.493) [5550]	.395 (0.489) [1017]		.445 (0.497) [2659]	.488 (0.500) [845]	**
SAT I Score conditional on Acceptance	1323 (107) [2320]	1172 (99) [402]	***	1344 (115) [1182]	1260 (103) [412]	***
SAT I Score conditional on Enrollment	1281 (107) [647]	1155 (100) [185]	***	1299 (113) [351]	1227 (97) [135]	***
Predicted SAT I Score* (based on those that want SAT I considered)	1272 (89) [5547]	1219# (82) [1017]	***	1263 (78) [2659]	1251# (90) [845]	***

SS, statistical significance ; *** statistically different at 1% level, ** statistically different at 5% level, *
Statistically different than the actual SATI score at the 1% level.
*Regression Results are in Table A1 of the Appendix.

TABLE 3
Probit: Dependent Variable (Accepted = 1)

	College X		College Y	
	I	II	III	IV
SAT1 Score/100 (16 max)	0.2939*	0.2207*	0.6164*	0.3978*
	(0.0214)	(0.0456)	(0.0282)	(0.0844)
Submitted SAT1 Score	-0.3989*	-1.3908**	-0.1833**	-3.0446*
	(0.0552)	(0.5516)	(0.0813)	(1.0482)
Submitted SAT1 Score* SAT1 Score/100		0.0849***		0.2306*
		(0.0470)		(0.0843)
Submitted SAT2 Score	-2.6954*	-2.6729*	-2.4031*	-2.4895*
	(0.2688)	(0.2690)	(0.4883)	(0.4895)
Submitted SAT2 Score* SAT2 Score/100	0.4554*	0.4517*	0.3688*	0.3826*
	(0.0422)	(0.0422)	(0.0759)	(0.0761)
Submitted ACT Score	-0.2171**	-0.2254**	2.3137**	1.0074
	(0.1079)	(0.1080)	(1.1182)	(1.2088)
Submitted ACT Score*ACT Score	0.0129*	0.0134*	-0.0684	-0.0220
	(0.0042)	(0.0042)	(0.0422)	(0.0452)
Attended Private High School	0.1250*	0.1254*	0.2016*	0.2032*
	(0.0400)	(0.0400)	(0.0574)	(0.0575)
Female	-0.5383*	-0.5369*	0.3179*	0.3175*
	(0.0393)	(0.0393)	(0.0520)	(0.0520)
No High School GPA reported	0.4608*	0.4628*	0.5356*	0.5423*
	(0.0896)	(0.0896)	(0.1270)	(0.1274)
High School GPA A+	0.9152*	0.9169*	0.9240*	0.9115*
	(0.1179)	(0.1179)	(0.1684)	(0.1686)
High School GPA A	0.8472*	0.8502*	0.8642*	0.8644*
	(0.0858)	(0.0858)	(0.1314)	(0.1316)
High School GPA A-	0.6509*	0.6527*	0.7023*	0.7026*
	(0.0762)	(0.0762)	(0.1207)	(0.1209)
High School GPA B+	0.4121*	0.4132*	0.5081*	0.5075*
	(0.0755)	(0.0756)	(0.1182)	(0.1184)
High School GPA B-	-0.3198**	-0.3187**	-0.2292	-0.2426
	(0.1578)	(0.1579)	(0.2402)	(0.2400)
High School GPA C	-0.5827***	-0.5845***	0.1748	0.1980
	(0.3422)	(0.3423)	(0.5214)	(0.5190)
Class rank missing	0.1361***	0.1394**	-0.0341	-0.0354
	(0.0708)	(0.0708)	(0.1088)	(0.1090)
Class rank 1st 10th	0.3930*	0.3942*	0.4593*	0.4577*
	(0.0763)	(0.0763)	(0.1218)	(0.1219)
Class rank 2nd 10th	0.2046*	0.2073*	-0.0011	-0.0014
	(0.0697)	(0.0698)	(0.1169)	(0.1170)
Class rank middle or bottom	-0.1502	-0.1468	-0.0544	-0.0448
	(0.1204)	(0.1203)	(0.1848)	(0.1849)

TABLE 3 (continued)

	College X		College Y	
	I	II	III	IV
Missing Income	0.1916*	0.1927*	0.0802	0.0803
	(0.0526)	(0.0527)	(0.0777)	(0.0778)
Income <50K	0.3311*	0.3291*	-0.1335	-0.1349
	(0.0728)	(0.0729)	(0.1145)	(0.1147)
50K <Income <100K	0.1132***	0.1155**	-0.2186**	-0.2079**
	(0.0580)	(0.0580)	(0.0910)	(0.0911)
Legacy (1=yes)	0.7501*	0.7482*	0.3033*	0.3030*
	(0.1220)	(0.1220)	(0.1051)	(0.1054)
Applied Early Decision	1.8209*	1.8192*	1.2020*	1.2052*
	(0.0859)	(0.0858)	(0.0846)	(0.0847)
Intend to Apply for Financial Aid	-0.0814**	-0.0813**	-0.2519*	-0.2530*
	(0.0409)	(0.0409)	(0.0576)	(0.0577)
African American	1.3637*	1.3642*	1.8549*	1.8491*
	(0.1079)	(0.1080)	(0.1546)	(0.1549)
Native American	0.1560	0.1521	1.0906***	1.0891***
	(0.3197)	(0.3207)	(0.5791)	(0.5808)
Asian	0.5073*	0.5054*	1.1541*	1.1488*
	(0.0855)	(0.0855)	(0.1185)	(0.1185)
Hispanic	0.5243*	0.5206*	1.5306*	1.5239*
	(0.0938)	(0.0939)	(0.1387)	(0.1386)
Unknown Race	-0.2077**	-0.2088**		
	(0.0826)	(0.0827)		
From State where College resides	0.0543	0.0535	0.0555	0.0597
	(0.0552)	(0.0552)	(0.0604)	(0.0605)
From Midwest	0.3432*	0.3459*	-0.0947	-0.0963
	(0.0812)	(0.0812)	(0.1213)	(0.1213)
From West	0.0004	0.0032	0.0407	0.0384
	(0.0644)	(0.0645)	(0.0978)	(0.0979)
From South	-0.1173***	-0.1159***	0.3741*	0.3786*
	(0.0611)	(0.0611)	(0.1160)	(0.1162)
Filled in College Board Survey (SDQ)	-0.1713	-0.1689	-0.1040	-0.0946
	(0.1362)	(0.1361)	(0.1893)	(0.1894)
# of HS Extracurricular Activities (sr)*Filled in SDQ	0.0166***	0.0163***	-0.0149	-0.0141
	(0.0086)	(0.0086)	(0.0128)	(0.0128)
# High School Sports (sr) *Filled in SDQ	-0.0237**	-0.0235**	0.0248	0.0243
	(0.0114)	(0.0114)	(0.0178)	(0.0178)
# High School offices/awards (sr) *Filled in SDQ	0.0281**	0.0284**	0.0006	0.0010
	(0.0142)	(0.0142)	(0.0225)	(0.0225)
# High School honors Classes (sr) *Filled in SDQ	0.0051	0.0052	0.0109	0.0112
	(0.0050)	(0.0050)	(0.0077)	(0.0077)
Observations	6564	6564	3504	3504

Notes: sr is "self reported" on SDQ. Omitted Categories: Income >$100K (sr); Race = white; HS GPA B, From Northeast.
Standard errors in parentheses: *** significant at 10%; ** significant at 5%; * significant at 1%

TABLE 4
Probit: Dependent Variable (Accepted = 1)
Selected Coefficients
With Predicted SAT I Score as Independent Variable

	College X		College Y	
	I	II	III	IV
Predicted SAT1 Score/100 (16 max)	0.3095***	0.2065***	0.6260***	0.3066***
	(0.0234)	(0.0652)	(0.0291)	(0.0897)
Requested school use SAT1 Score	-0.1631***	-1.4463*	-0.0340	-4.1312***
	(0.0518)	(0.7602)	(0.0806)	(1.0941)
Requested school use SAT1 Score* SAT1 Score/100		0.1039*		0.3248***
		(0.0614)		(0.0864)
Requested school use SAT2 Score	-2.4979***	-2.5905***	-2.2793***	-2.5132***
	(0.2795)	(0.2852)	(0.4887)	(0.4947)
Requested school use SAT2 Score* SAT2 Score/100	0.4256***	0.4401***	0.3468***	0.3852***
	(0.0439)	(0.0448)	(0.0760)	(0.0770)
Requested school use ACT Score	-0.1884*	-0.2157***	0.4580	-0.5234
	(0.1082)	(0.1095)	(1.0611)	(1.0994)
Requested school use ACT Score*ACT Score	0.0130***	0.0139***	0.0051	0.0360
	(0.0042)	(0.0042)	(0.0401)	(0.0412)
Observations	6564	6564	3504	3504

Notes: Includes same set of covariates as in Table 3. sr is "self reported" on SDQ. Omitted Categories: Income >$100K (sr); Race = white; HS GPA B, From Northeast. Standard errors in parentheses: *** significant at 10%; ** significant at 5%; * significant at 1%

Table 5
Ordinary Least Squares: Dependent Variable (Freshman GPA)

	College X 4 Pt. Scale	College Y 100 Pt. scale
SAT1 Score/100	0.0422*	0.4817***
	(0.0157)	(0.2793)
Submitted SAT1 Score	-0.0421	-0.6667
	(0.0357)	(0.7273)
Submitted SAT2 Score	-0.4833**	-16.7124*
	(0.2015)	(4.9917)
Submitted SAT2 Score* SAT2 Score/100	0.0882*	2.4936*
	(0.0320)	(0.7627)
Submitted ACT Score	0.0118	2.0919
	(0.0833)	(11.5219)
Submitted ACT Score*ACT Score	-0.0008	0.0013
	(0.0032)	(0.4238)
Attended Private High School	-0.0378	-0.6580
	(0.0296)	(0.5418)
Female	0.1572*	1.4149*
	(0.0278)	(0.4708)
No High School GPA reported	0.0527	1.6489
	(0.0633)	(1.1871)
High School GPA A+	0.2384*	5.2245*
	(0.0900)	(1.5540)
High School GPA A	0.2414*	4.6111*
	(0.0618)	(1.1844)
High School GPA A-	0.0796	2.9974*
	(0.0564)	(1.1325)
High School GPA B+	0.0851	2.2029**
	(0.0535)	(1.0688)
High School GPA B-	-0.3037*	2.0015
	(0.1103)	(2.3748)
High School GPA C	0.3819	7.7004
	(0.3784)	(5.2932)
Class rank missing	0.0470	0.1558
	(0.0516)	(1.0174)
Class rank 1st 10th	0.1254**	0.7728
	(0.0570)	(1.1744)
Class rank 2nd 10th	0.0561	0.1561
	(0.0509)	(1.1401)
Class rank middle or bottom	-0.0598	2.0831
	(0.0931)	(1.7112)
Missing Income	-0.0469	-0.3336
	(0.0377)	(0.7165)
Income <50K	-0.0659	-3.2670*
	(0.0509)	(1.1724)

Table 5 (continued)

	College X 4 Pt. Scale	College Y 100 Pt. scale
50K <Income <100K	-0.0358	-1.6516***
	(0.0424)	(0.8868)
Legacy (1=yes)	-0.0236	0.3674
	(0.0626)	(0.7953)
Applied Early Decision	-0.0121	-0.7555
	(0.0268)	(0.5081)
Intend to Apply for Financial Aid	0.0844*	0.4649
	(0.0307)	(0.5290)
African American	-0.2810*	0.0348
	(0.0810)	(1.6311)
Native American	-0.3292***	-7.3046**
	(0.1682)	(2.9049)
Asian	-0.1015	-0.3557
	(0.0691)	(1.1669)
Hispanic	-0.3766*	-2.1657
	(0.0788)	(1.3340)
Unknown Race	-0.0880	
	(0.0678)	
From State where College resides	0.0125	-0.1750
	(0.0371)	(0.5454)
From Midwest	0.0079	0.0966
	(0.0576)	(1.1778)
From West	-0.0191	2.3525**
	(0.0460)	(1.0216)
From South	0.0389	1.0956
	(0.0499)	(1.1218)
Filled in College Board Survey (SDQ)	-0.1095	1.5634
	(0.1041)	(1.7667)
# of HS Extracurricular Activities (sr) *Filled in SDQ	0.0045	0.1095
	(0.0060)	(0.1192)
# High School Sports (sr) *Filled in SDQ	-0.0128	-0.3438**
	(0.0080)	(0.1616)
# High School offices/awards (sr) *Filled in SDQ	-0.0062	0.0371
	(0.0099)	(0.2090)
# High School honors Classes (sr) *Filled in SDQ	-0.0061***	0.0232
	(0.0034)	(0.0736)
Constant	2.6623*	75.1317*
	(0.2253)	(4.3008)
Observations	857	466
R-squared	0.2788	0.2695

Notes: sr is "self reported" on SDQ. Omitted Categories: Income >$100K (sr); Race = white; HS GPA B, From Northeast.
Standard errors in parentheses: *** significant at 10%; ** significant at 5%; * significant at 1%

TABLE 6
Probit Regression: Dependent Variables (Chose Not to Submit SAT I = 1)

	College X		College Y	
	I	II	III	IV
SAT1 Score/100 (16 max)	-0.6257*		-0.3122*	
	(0.0251)		(0.0272)	
Verbal SAT1 Score/100 (8 max)		-0.7143*		-0.4033*
		(0.0396)		(0.0427)
Math SAT1 Score/100 (8 max)		-0.5459*		-0.2187*
		(0.0384)		(0.0436)
SAT2 Score(s) available (1=yes)	-1.1052*	-1.2008*	-1.9066*	-1.9698*
	(0.2670)	(0.2690)	(0.3184)	(0.3191)
Average SAT2/100*SAT2 Score(s) available	0.2043*	0.2208*	0.3907*	0.4013*
	(0.0448)	(0.0452)	(0.0520)	(0.0522)
ACT Score(s) available (1=yes)	-2.6560**	-2.6598**	-0.8398***	-0.8771***
	(1.2537)	(1.2565)	(0.4611)	(0.4608)
Average ACT/100*ACT Score(s) available	0.0853***	0.0854***	0.0208	0.0223
	(0.0516)	(0.0517)	(0.0173)	(0.0173)
Attended Private High School	0.1024**	0.1110**	0.1397**	0.1393**
	(0.0479)	(0.0481)	(0.0548)	(0.0549)
Female	0.2244*	0.2421*	0.1070**	0.1335*
	(0.0495)	(0.0501)	(0.0503)	(0.0513)
No High School GPA reported	0.0880	0.0906	0.0941	0.0927
	(0.1001)	(0.1002)	(0.1156)	(0.1158)
High School GPA A+	0.2523***	0.2546***	0.0189	0.0216
	(0.1463)	(0.1466)	(0.1617)	(0.1619)
High School GPA A	0.3243*	0.3214*	0.1183	0.1176
	(0.0958)	(0.0959)	(0.1202)	(0.1204)
High School GPA A-	0.1838**	0.1866**	0.2100***	0.2108***
	(0.0837)	(0.0838)	(0.1078)	(0.1079)
High School GPA B+	0.0013	0.0015	0.2178**	0.2157**
	(0.0821)	(0.0822)	(0.1035)	(0.1036)
High School GPA B-	-0.0979	-0.1016	-0.4177***	-0.4088***
	(0.1520)	(0.1522)	(0.2182)	(0.2180)
High School GPA C	-0.5356***	-0.5385***	-0.6100***	-0.6095***
	(0.2846)	(0.2850)	(0.3447)	(0.3452)
Class rank missing	0.0875	0.0799	-0.0764	-0.0781
	(0.0803)	(0.0804)	(0.1012)	(0.1013)
Class rank 1st 10th	0.0573	0.0490	-0.0594	-0.0712
	(0.0912)	(0.0913)	(0.1155)	(0.1158)
Class rank 2nd 10th	0.0240	0.0205	-0.0581	-0.0565
	(0.0808)	(0.0809)	(0.1092)	(0.1093)
Class rank middle or bottom	-0.1460	-0.1475	-0.0330	-0.0376
	(0.1177)	(0.1176)	(0.1591)	(0.1592)

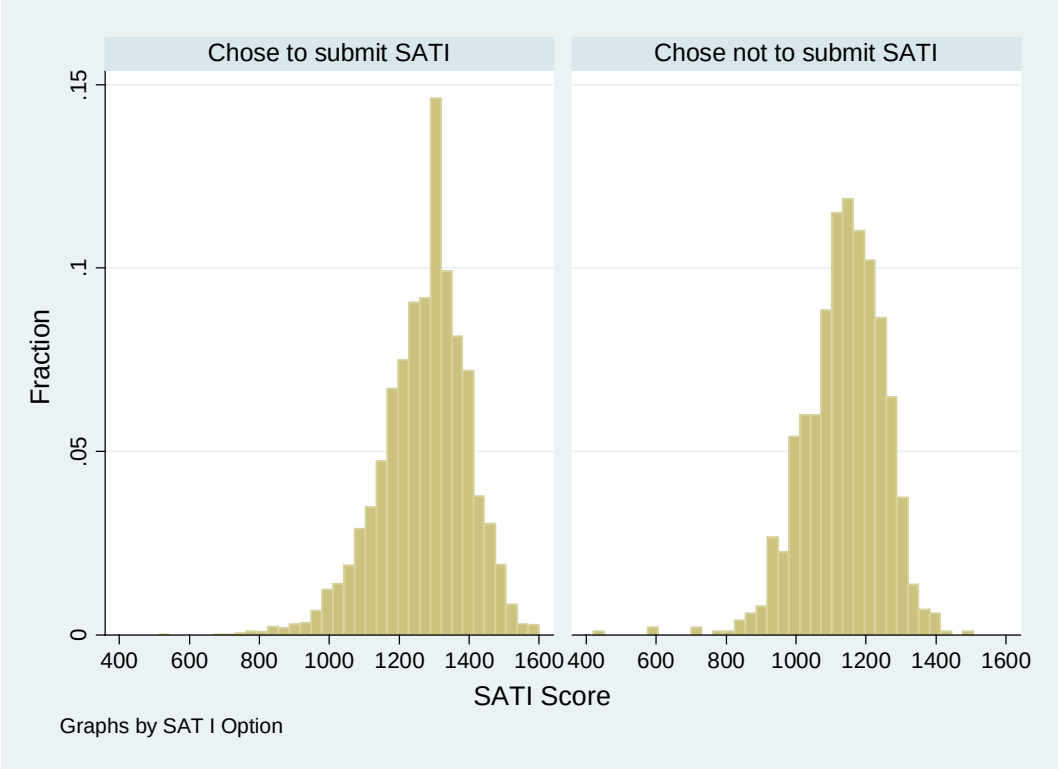
TABLE 6 (continued)

	College X		College Y	
	I	II	III	IV
Missing Income	0.0990	0.1055***	0.0262	0.0266
	(0.0629)	(0.0631)	(0.0755)	(0.0756)
Income <50K	-0.0943	-0.0868	0.2297**	0.2331**
	(0.0862)	(0.0864)	(0.1073)	(0.1074)
50K <Income <100K	0.0755	0.0890	-0.0038	-0.0012
	(0.0690)	(0.0693)	(0.0880)	(0.0881)
Legacy (1=yes)	0.0727	0.0623	-0.1140	-0.1154
	(0.1441)	(0.1445)	(0.1041)	(0.1042)
Intend to Apply for Financial Aid	-0.0489	-0.0414	-0.2142*	-0.2102*
	(0.0488)	(0.0490)	(0.0558)	(0.0558)
African American	-0.5931*	-0.5963*	0.0720	0.0885
	(0.1265)	(0.1269)	(0.1347)	(0.1348)
Native American	-0.1151	-0.0939	-0.0280	-0.0191
	(0.3067)	(0.3067)	(0.4982)	(0.4962)
Asian	-0.1004	-0.1273	-0.1758	-0.2136***
	(0.1074)	(0.1078)	(0.1174)	(0.1185)
Hispanic	-0.4277*	-0.4374*	-0.0340	-0.0393
	(0.1112)	(0.1114)	(0.1274)	(0.1273)
Unknown Race	0.0110	0.0158		
	(0.1041)	(0.1042)		
From State where College resides	-0.1176***	-0.1175***	-0.2029*	-0.2038*
	(0.0661)	(0.0663)	(0.0596)	(0.0597)
From Midwest	0.3098*	0.3055*	0.0960	0.0886
	(0.0850)	(0.0852)	(0.1251)	(0.1253)
From West	0.1300***	0.1393***	-0.1402	-0.1329
	(0.0758)	(0.0760)	(0.1002)	(0.1002)
From South	0.0873	0.0789	0.1965***	0.2025***
	(0.0707)	(0.0708)	(0.1077)	(0.1077)
Filled in College Board Survey (SDQ)	0.0632	0.0721	0.0001	-0.0111
	(0.1432)	(0.1433)	(0.1700)	(0.1702)
# of HS Extracurricular Activities *Filled in SDQ	-0.0040	-0.0011	-0.0096	-0.0066
	(0.0101)	(0.0101)	(0.0122)	(0.0122)
# High School Sports*Filled in SDQ	0.0153	0.0108	0.0130	0.0094
	(0.0134)	(0.0135)	(0.0171)	(0.0172)
# High School offices/awards *Filled in SDQ	0.0158	0.0157	-0.0377***	-0.0373***
	(0.0171)	(0.0172)	(0.0224)	(0.0224)
# High School honors Classes *Filled in SDQ	0.0003	-0.0010	0.0156**	0.0145***
	(0.0062)	(0.0062)	(0.0075)	(0.0076)
Observations	6564	6564	3504	3504

Notes: sr is "self reported" on SDQ. Omitted Categories: Income >$100K (sr); Race = white; HS GPA B, From Northeast. Standard errors in parentheses: *** significant at 10%; ** significant at 5%; * significant at 1%.

Figure 1: Distribution of SAT 1 Scores

College X



College Y

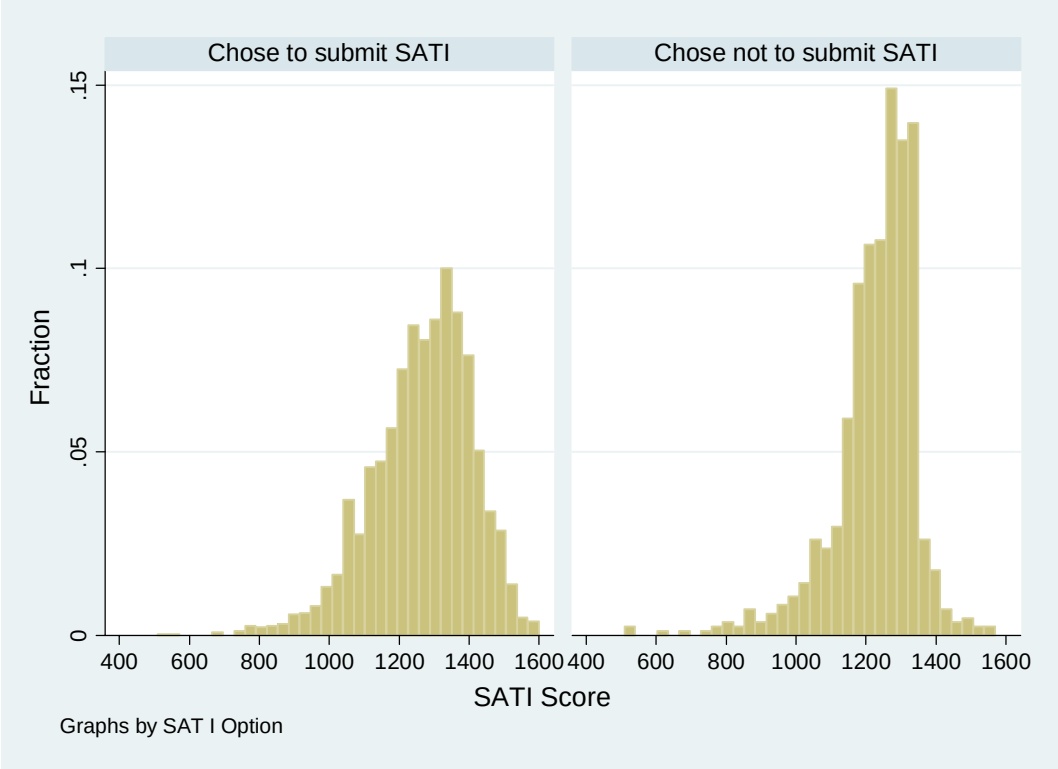
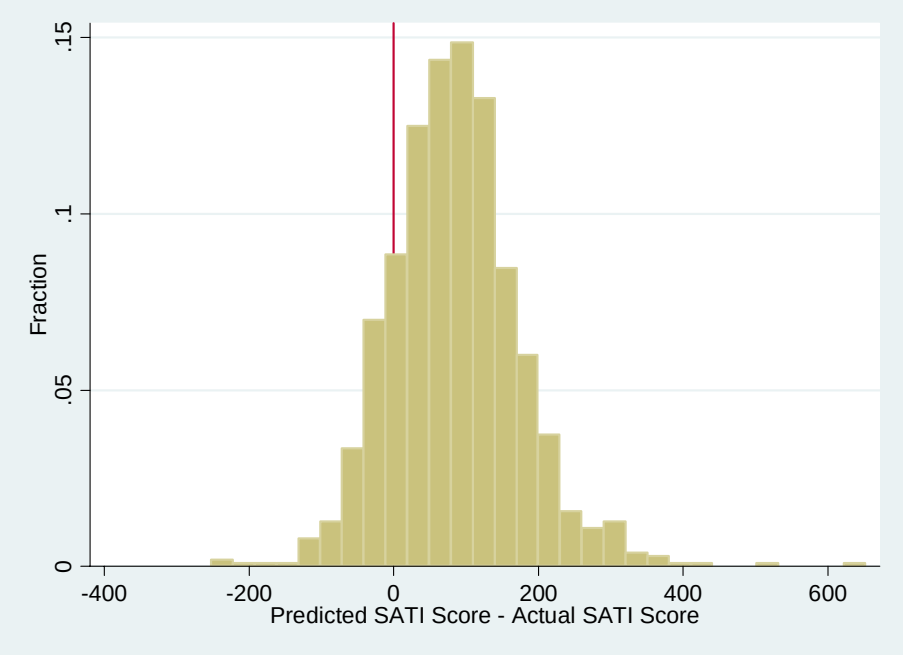
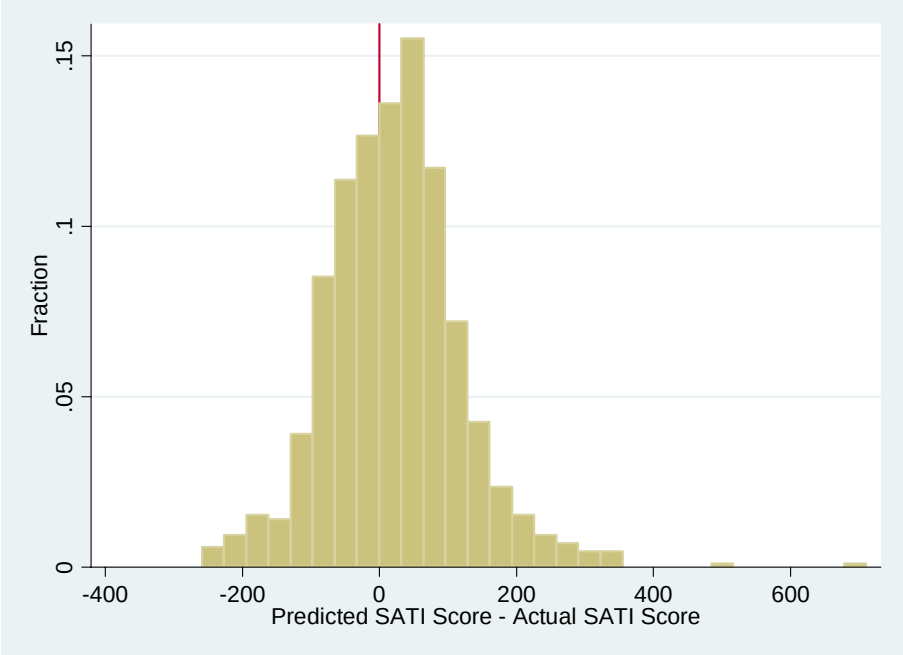


Figure 2: Predicted versus Actual SAT 1 Score for those who Chose not to Submit SAT1

College X



College Y



Appendix

TABLE A1
Ordinary Least Squares: Dependent Variable (SAT I Score)
Obtain "Predicted" SAT Scores for those who Don't Submit

	College X	College Y
Requested school use SAT2 Score	-7.1460*	-6.6519*
	(0.1383)	(0.3173)
Requested school use SAT2 Score* SAT2 Score/100	1.1879*	1.0957*
	(0.0213)	(0.0492)
Requested school use ACT Score	-0.9155*	-1.0091
	(0.0677)	(1.4830)
Requested school use ACT Score*ACT Score	0.0252*	0.0148
	(0.0027)	(0.0561)
Attended Private High School	0.0322	0.1003**
	(0.0260)	(0.0451)
Female	-0.2202*	-0.3188*
	(0.0251)	(0.0404)
No High School GPA reported	0.1530*	0.5087*
	(0.0565)	(0.0953)
High School GPA A+	0.3664*	0.7300*
	(0.0757)	(0.1255)
High School GPA A	0.1869*	0.4669*
	(0.0546)	(0.0978)
High School GPA A-	0.1955*	0.3074*
	(0.0472)	(0.0891)
High School GPA B+	0.0745	0.1847**
	(0.0461)	(0.0879)
High School GPA B-	-0.0831	-0.1863
	(0.0864)	(0.1556)
High School GPA C	-0.7961*	-1.3710*
	(0.1613)	(0.2550)
Class rank missing	0.0633	0.1778**
	(0.0451)	(0.0857)
Class rank 1st 10th	0.1678*	0.4606*
	(0.0499)	(0.0965)
Class rank 2nd 10th	0.0201	0.1025
	(0.0449)	(0.0919)
Class rank middle or bottom	-0.1579**	0.0726
	(0.0680)	(0.1326)
Missing Income	-0.0441	0.0838
	(0.0342)	(0.0615)
Income <50K	-0.2706*	-0.4614*
	(0.0478)	(0.0881)

TABLE A1 (cont.)

	College X	College Y
50K <Income <100K	-0.0131	-0.1272***
	(0.0373)	(0.0698)
Legacy (1=yes)	0.0823	-0.0502
	(0.0758)	(0.0837)
Applied Early Decision	-0.0798	-0.3885*
	(0.0494)	(0.0642)
Intend to Apply for Financial Aid	-0.0604**	-0.2289*
	(0.0266)	(0.0454)
African American	-0.8127*	-1.5804*
	(0.0716)	(0.1122)
Native American	-0.7613*	-0.6462
	(0.2227)	(0.4502)
Asian	-0.0233	0.0063
	(0.0577)	(0.0907)
Hispanic	-0.7014*	-0.9283*
	(0.0622)	(0.1061)
Unknown Race	0.1697*	
	(0.0532)	
From State where College resides	-0.1245*	-0.1680*
	(0.0352)	(0.0469)
From Midwest	0.0901	0.0809
	(0.0567)	(0.0995)
From West	0.0877**	0.1621**
	(0.0428)	(0.0785)
From South	-0.0019	-0.1697***
	(0.0404)	(0.0939)
Filled in College Board Survey (SDQ)	-0.1406***	0.1179
	(0.0805)	(0.1385)
# of HS Extracurricular Activities (sr) *Filled in SDQ	0.0132**	0.0246**
	(0.0056)	(0.0101)
# High School Sports (sr) *Filled in SDQ	-0.0197*	-0.0407*
	(0.0074)	(0.0140)
# High School offices/awards (sr) *Filled in SDQ	-0.0194**	-0.0328***
	(0.0096)	(0.0176)
# High School honors Classes (sr) *Filled in SDQ	0.0245*	0.0648*
	(0.0033)	(0.0060)
Constant	12.5705*	12.1170*
	(0.1044)	(0.1905)
Observations	5547	3131
R-squared	0.5220	0.3102

Notes: sr is "self reported" on SDQ. Omitted Categories: Income >$100K (sr); Race = white; HS GPA B, From Northeast.
Standard errors in parentheses: *** significant at 10%; ** significant at 5%; * significant at 1%