Information and College Access:
Evidence from a Randomized Field Experiment

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This paper considers the role of information (or lack of) for college access. High school students from disadvantaged schools in all grades were invited to go online and take two surveys, about three weeks apart. Half of the students in the first survey were also shown a 3 minute video about college and invited to try out a financial-aid calculator to approximate their own expected grant and loan eligibility. Students that took the first survey and were exposed to the additional information were, three weeks later, significantly more likely to say they aspired to complete at least a college degree, they had higher expectations of their own returns to PSE, they were more likely to believe they were eligible for grants, and they were less likely to believe the main reason students don't go to on to PSE is because of costs. Moreover, these students were more likely to download an additional document that offered additional (and printable) information about college, and were more likely to request additional information about specific college programs.

JEL Classification: H2, I2, J24

I. Introduction

This paper considers the role of information (or lack of) for college access. Many researchers and policy makers take for granted that students have the same information from all available sources when making school choices. But clearly, students receive information in many different forms, from many different people. Students may not access the same information the same way. Just because information is available on the internet, for example, does not mean everyone knows about it or understands what it means. There is growing evidence that how information is provided, and how access to post secondary education (PSE) is promoted matters in important ways.

For example, many students guess incorrectly about PSE costs and benefits. Usher (2005) finds that Canadians in general overestimate average tuition costs by an average factor of two. The average annual income differential between high school and university graduates is also underestimated by Canadians, in particular by low-income Canadians. Similar findings arise from many U.S. studies. Research by Kane and Avery (2004) demonstrates that high school students, especially from low-income family background, have very little understanding of actual college tuition levels, financial aid opportunities, and how to navigate the admissions process. Other work has also found a significant lack of information among prospective PSE students in general (Ikenberry and Hartle 1998; Horn, Chen, and Chapman, 2003).

In Canada, individuals do not typically apply for financial aid until after accepting and enrolling in a PSE program, and must deal with long lines, busy tones, and forms, before learning how much in grants and loans they are eligible for. Some provinces provide financial aid calculators to estimate financial aid availability (e.g. the Ontario site, http://accesswindow.osap.gov.on.ca/ became available in 2007), yet these calculators are not often promoted at high schools at a time when students are likely to be making key decisions that affect whether they go. Moreover, existence of these calculators may not be enough to increase knowledge of financial aid if students or parents do not use them. Research on examples of highly-publicized financial aid programs characterized as being simpler in design and application finds large enrollment responses (e.g. Dynarski, 2002, Currie, 2004).

There is also evidence that providing information about the benefits of PSE may increase interest in attending. Jensen (2010) surveys students from the Dominican Republic and finds

that while the measured returns to schooling are high, the returns perceived by students are extremely low. Students provided with information on the higher measured returns reported increased perceived returns several months later. The least-poor of these students were also significantly less likely to drop out of school in subsequent years. Nguyen (2007) arrives at similar conclusions after conducting a similar experiment in Madagascar. Teachers at randomly selected schools reported to parents and children the average earnings at each level of education, as well as the implied gain. Providing these statistics reduced the large gap between perceived returns and the statistics provided, and in addition improved average test scores. For students that initially perceived returns below the statistics, test scores improved substantially.

To our knowledge, this paper is the first to explore the effects of prompting students to go online and receive information about student aid and PSE benefits. The research presented builds from previous work suggesting that the mode of presentation and the framing of issues can have substantial impact. In particular, much of this recent literature questions the assumption that the simple availability of information warrants assumptions of its having been attended to, processed, and adequately understood.

We test whether small differences in the way information about PSE is provided affects students' interest and expectations in going. Our study involves inviting high school students from disadvantaged schools in all grades to go online and take two surveys, about three weeks apart. The first survey asks demographic questions and asks about students' knowledge about PSE. Half of the students that take the first survey are also shown a simple video about PSE and invited to try out a financial-aid calculator to approximate their own expected grant and loan eligibility in attending college or university, part-time or full-time. The multi-media presentation takes about three minutes, and presents simplified information about costs, benefits, and access to PSE. The paper reports whether the additional information provided in the first survey affects educational aspirations, financial aid expectations, expected returns to schooling, and interest in acquiring additional PSE information in the second survey.

A majority of our participants believe costs to PSE are the most important reason why some people don't attend. Only 13 percent of students believe that any qualified student can attend PSE regardless of financial need (which the province of Ontario guarantees). Most students said they intend to go to university, but this could be because students that were more

interested in PSE were also more likely to go online to take the survey. We offered $20 for students to complete both surveys, but still the response rate was only about 35 percent.

Despite not reaching many targeted students to take the surveys, and despite the fact that students who received the online information could ignore it or skip quickly through it, the results are still surprisingly clear cut in suggesting that information matters. Students that took the first survey and were exposed to the additional information about PSE were, three weeks later, significantly more likely to say they aspired to complete at least a college degree, they had higher expectations of their own returns to PSE, they were more likely to believe they were eligible for grants, and they were less likely to believe the main reason students don't go to on to PSE is because of costs. Moreover, these students were more likely to download an additional document that offered additional (and printable) information about PSE, and were more likely to request additional information about specific colleges and universities. These results were driven mostly by students who initially said in the first survey they were unsure about their education aspirations, or who intended to stop after high school, which is consistent with our expectation that those who have the most to gain from this information are those initially the least likely to go.

The next section outlines our experiment. Section three describes our data. The fourth section presents results, and we conclude with a discussion on the results and possible policy implications.

II. Methodology

The study was carried out in Toronto, with approval by the Toronto District School Board's (TDSB) External Research Review Committee (ERRC). We were allowed to contact principals to discuss the study although that contact did not bind them to participate. Principals and faculty at participating schools were asked to inform the students about the project, while the onus was on the student to access the study during their free time. All other communication between the research team and the participants needed to occur privately and external to the school.

Identification and Contact with the Schools

We identified 8 TDSB schools to contact: Westview Centennial Secondary School, Emery Colligate Institute, Downsview Secondary School, George Harvey Colligate Institute, York Memorial, North Albion Colligate Institute, CW Jefferys Colligate Institute, and West Humber. Westview Centinnial Secondary School and Downsview Secondary School declined participation in the study. George Harvey Colligate Institute agreed to participate in the study, but could not meet project timelines. These schools were identified because they were located in low-income neighbourhoods of Toronto. We hoped to target students that had little initial intention of attending PSE. Data provided by Dr. Andrew Johnstone was used. These data identified the average family and household income for all Ontario high schools.

Distribution of Information about the Study

The initial methodology proposed to HRSDC called for teachers or other personnel in the school to encourage students to participate in the study. In the proposal sent to the ERRC, homeroom teachers in the identified institutions were asked to do the initial leg- work for the study. In the ERRC's application guidelines, the collection of consent forms was a necessary component for project approval. It was proposed that teachers would need to provide students with information about the study and would also distribute the consent forms. A script would have been provided to teachers stating the rough outline of the study and state the time expectations of participation. Furthermore, the script would have included information about the incentives for participants.

In order to minimize the amount of administrative work performed by school staff, students and parents would have been asked to provide their e-mail addresses on the consent form. Once the consent forms had been completed and returned to the schools, the research team would have generated a database with the names and e-mail addresses for the willing participants. An e-mail would have been sent to all participants with the link to the secured website. Once on the website, participants simply needed to enter their e-mail address as an identification code.

The ERRC deemed this practice to be too much work for the teachers and staff. However the ERRC deemed the research to be at "an arms-length" to the TDSB, meaning the research was conducted on-line, not in the schools.

ERRC permitted the distribution of a post-card-sized flyer to all students in the high schools. Between December 5th and January 20th, homeroom teachers in the identified schools distributed the flyers to students in the homeroom. Each flyer contained the survey website and a unique password to access the survey. To reduce the potential for survey contamination each password could only be entered into the survey site once.

Participant Consent

Students that went online to begin the first survey were briefed on the purpose of the study and invited to consent to participate. It was explained that the study concerned students' knowledge about post-secondary education, and that all information collected from the study would be used for research purposes only, and presented in a highly aggregated way such that no individual would ever be identified.

Students logged onto www.lifeafterhighschool.ca and were asked to enter their unique password. Once the password had been used, the student was taken to the user agreement. The user agreement articulated the use of data and the protection of private information collected on the site. If the student agreed to participate in the study, then they were asked to provide a valid e-mail address. An e-mail address was required in order to provide the link to the second survey site and distribute the incentive to the participant. The user agreement explicitly stated that the e-mail address would only be used for those purposes and would be destroyed after the incentive had been distributed and the research was complete.

The First Survey

The first survey asked students a set of basic demographic questions about their education aspirations, parental education, ethnicity, and grade performance. From there the survey explored participants' knowledge of their own financial aid eligibility depending on the type of

PSE they enrolled in, and whether they attended part-time or full-time. The survey concluded by asking students about why they expect or do not expect to enroll in a PSE program.

The Treatment Group and Control Group

Individuals were randomly chosen between receiving additional information about PSE at the end of the first survey or not. The control group served as the main comparison group to determine the impact of the proposed interventions on knowledge and interest about PSE. For those selected into the control group, the first part of the study ended after completing the survey. The web site thanked them for their time, reminded them that they will be asked to complete a second survey in a few weeks, and will receive $20 for their participation (or a gift certificate or could donate their $20 to their school) for completing the second survey.

Both treated and control students were asked to click 'done' at the end of the first survey. Treated students were then shown a multi-media web page providing video, text, and a financial aid calculator. The three-minute web-based video promoted the benefits of PSE while discussing costs involved and how financial aid helps students attend. The video was professionally designed and targeted to a youth audience. The text of the video script was provided in a window next to it, to follow along. The purpose for posting the script was also to accommodate students who may not have speakers.

A simple financial aid calculator, developed by the Educational Policy Institute, was also made available on the treatment page. Students had the ability to watch the video as well as estimate the available grant and loan values if they went to college or university. The calculator required students to estimate their parents' income. Students were provided with a drop down list of family incomes. Additionally, there was a button on the financial aid calculator that allowed students to produce their results in a printable page. On this printable page, the financial aid package for Toronto universities and colleges was provided as well as a few paragraphs about applying for OSAP.

After trying out the financial aid calculator, students were asked to click 'done' when finished. They were then shown the same page as the controls thanking them for their participation and reminding them to expect a notice in three weeks about taking the second survey.

Selection of the Control and Treatment Groups

Students that logged on to the study's web site were selected into either the treatment or control group in alternating order. In other words, every other student that logged onto and completed the first survey was also shown the additional PSE information page.

The Second Survey

Students were sent a reminder and link to the second survey site three weeks after completing the first. Included in the reminder e-mails were password reminders required for accessing the second survey site.

The second survey focused on questions about students' expected earnings under alternative education attainment scenarios, students' expectations about grant and loan eligibility, and students' education aspirations. Some questions were identical the first survey, such as education aspirations in part to examine how responses to these questions changed over time depending on treatment status.

In the initial proposal, at the end of the second survey individuals would have been asked whether they would like a guidance counselor to contact them to arrange a meeting to discuss PSE preparation. Asking this question allows us to link the interventions with an actual behavioural response that likely indicate a real interest in PSE attendance. This idea was not acceptable to the ERRC and was dropped from the methodology.

In the end, to measure a behavioural change in the students, the survey asked if the participant wished to receive more information regarding the college and university application process, as well as any additional information about post-secondary institutions in Ontario. Furthermore, students were able to download a PDF booklet about applying to post-secondary education.

Distribution of the Incentives

Once the student completed the survey they were sent to a screen where they could select the form of payment. Students were given the option of receiving a $20 e-mail money transfer, a

$20 iTunes gift card, a $20 Chapter's gift card, or they could make a $20 donation to the school. Students were informed that the incentives would be e-mailed to them.

III. Data

Sample Size

The initial target sample was 2000 students; to achieve this sample we distributed 5,071 cards to 5 identified schools. 1713 students completed the first survey; however 339 of the responses had the same e-mail address and were discarded before generating results. We are not able to tell exactly how many of the 5,017 cards were distributed to unique students, which makes it impossible to know the study's attrition rate for sure. It does appear clear, however, that many invited students did not log on to the project's site.

Initially the survey site did not deny duplicate e-mail addresses from being entered. Some enterprising students at each of the high schools obtained survey PIN's from classmates and entered the survey site twice. This error was discovered midway through the data collection and a filter was put in place for the second survey. The filter identified the duplicate e-mail addresses and only sent a single link to the second survey site. In effect, the student was only given access to the second survey once.

For the purposes of the data analysis, all responses of students with duplicate e-mail addresses were eliminated from the database. All entries were omitted because it was impossible to ascertain if the students filled out the same answers in each of the surveys. Although only one link to the second survey site was provided to a multiple response e-mail, it was impossible to know which of their first surveys was filled out in earnest. Therefore, the responses to the second survey could not accurately be matched up to the first survey responses (nor was it desirable to assume data from these students would be accurate).

After discarding duplicates, there were 1374 unique individuals who completed the first survey and were invited to complete the second survey. Of the 1374 who received the first survey, 50.3% received the treatment.

The attrition rate from the first to second survey for the unique individuals was 35%. Once the duplicates are eliminated the second survey sample is 894. Importantly, as we show below, completing the second survey was uncorrelated with treatment status.

IV. Results

Top Sheet Results

Table 1 shows descriptive data from the first survey. The proportion of students by grade is about evenly split. The grade 9 and 12 students accounted for 29% and 28% of the sample, respectively; and the grade 10 and 11 students accounted for 21% and 22% of the total sample, respectively. 54% are female. The average reported grade for the entire sample is 78%.

A very large fraction of respondents are first or second generation immigrants. Of the 1374 respondents, 60 percent are native born, and only 5.4% have any parent born in Canada. The 5 schools that participated in the survey are located in areas of the city with high immigrant populations. The educational attainment levels for the samples parents is also quite low: 30% of the sample report that their father has a university degree; 21 % report that their mother has a university degree; 9.3% say that their father has a high school diploma or less; and 41% report that their mother has a high school diploma or less.

Survey participants are asked “What is the highest level of education you expect to get?”; a drop down menu listed the following response options: less than high school; high school; trade or vocational certificate or diploma or apprenticeship; community college; one university degree; more than one university degree; and don’t know. In order to simplify the analysis the options are grouped into four categories 1) highest expected degree is High School; 2) highest expected degree is college; 3) highest expected degree is University; and 4) Unsure about highest degree. Those who answered “trade or vocational certificate or diploma or apprenticeship” are included in the second category.

A majority of survey respondents say they would be getting a college degree or university degree. Only 2.8% of the sample state that the highest expected level of education would be a diploma. Interestingly, only 1.6% of the grade 12 respondents said that a high school diploma would be the highest level of education attained.

Students were asked hypothetical questions about non-repayable financial aid. The questions asked: "If you go to college or university, do you think you would be eligible to receive government grant assistance (money you do not have to pay back)?". A small percentage of the sample did not believe that they would be eligible for a grant – 41.6% believe they are eligible for a grant and 43.2 are not sure if they are eligible for a grant. There is a stark contrast between the grade 11 and grade 12 samples with regards to the perceived eligibility of grants. Almost half of the grade 12 sample believe they are eligible for a grant, where as approximately one-third of the grade 11 sample believe they are eligible for a grant. Moreover, only 37.6% of the grade 12 sample is unsure of their grant eligibility and 47.8% of the grade 11 sample is unsure of their grant eligibility. Table 1 displays the descriptive mean statistics from survey 1 participants, by grade level.

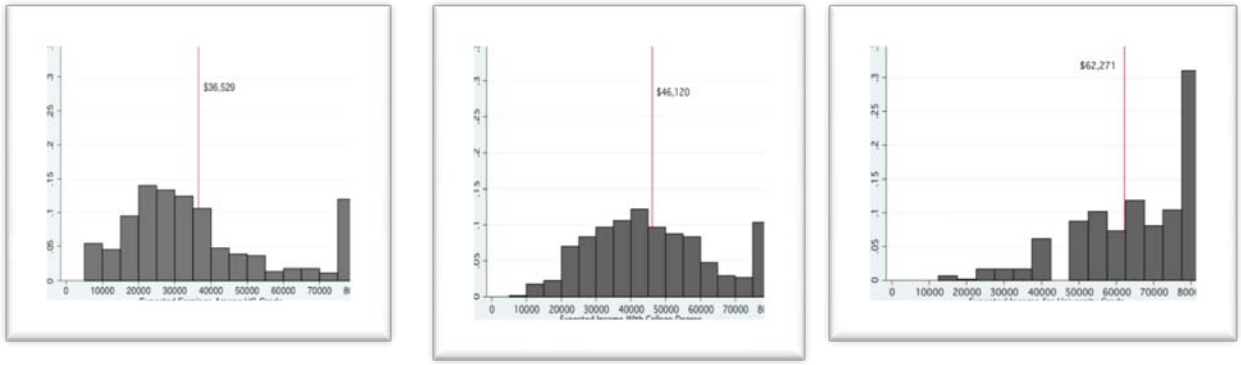
Expected Income for High School, College and University Graduates

In the second survey, participants were asked to answer a series of questions based on income attainment. Students were informed that average earnings for a 35 year-old in Toronto is about $38,000. They were then asked "Suppose that you were to graduate from high school, but not go on to pursue any more schooling. What would you expect your annual income to be at age 35?"; "How much do you think you would earn if instead you were to complete a two-year college program?"; and "How much do you think you would you earn at age 35 if you completed a four-year Bachelor's degree in university?". The survey provided students with a drop down list with ranges of incomes. The ranges started at "less than $10,000" and increased in $5,000 increments. The highest income a student could select was "greater than $80,000". Both the control group and treatment group were asked to fill out this information.

The control group average estimated salary for a 35 year old high school graduate is $36,529 with the majority of respondents estimating a salary in the range of $15,000 to $40,000. Interestingly, approximately 12% of the control group respondents said that a 35 year old high school graduate would earn more than $80,000 per annum. According to the control group, the average salary for a 35 year old with a 2 year college diploma is $46,120. Approximately 60% of the respondents estimated that a 2 year college grad would earn between $30,000 and $60,000 with 10% stating that the annual earnings would exceed $80,000 a year. Finally, the average reported salary with a university degree was $62,271, and the highest response frequency was a salary greater than $80,000. It is important to note that a small percentage of the control group estimated that the expected earnings of a university grad would be below $50,000. Figure 1 displays the frequency of responses for the expected earnings of 35 year olds based on educational attainment.

Figure 1
Income Expectations, Conditional on Hypothetical Education Attainment

A. Expected Earnings of HS Grad **B. Expected Earnings of College Grad** **C. Expected Earnings of University Grad.**



Notes: The figures show the distribution of responses to income expectations by education attainment status. In the second survey, students were asked "The average income for someone aged 35 in Canada is $38,200. Suppose that you were to graduate from (high school; a 2-year college; a 4-year university). What would you expect your annual income to be at age 35?" Figure A shows the distribution in responses regarding high school income. Figure B shows the distribution regarding college income, and Figure C shows the distribution regarding university income. Only the control sample is used for these histograms. The last bin includes all those responding $80,000 or more. The vertical line indicates the average response.

Since all respondents were required to estimate salaries for each level of education, the income expectations can be expressed as a quotient relative to the high school education. Quotients greater than one indicate an estimated higher salary return for college or university than high school. For example, if a respondent indicated that the average high school salary was $30,000, the average college salary was $45,000, and the average university salary was $60,000, then the college quotient would be 1.5 and the university quotient would be 2. The college grad makes 50% more than the high school grad and the university grad makes double the high school grad.

Since the estimated high school salary is the denominator, two values can be generated: an imputed return to college and university based on the relative high school salary. The average sample quotient for the college earnings is smaller than the average sample quotient for the university earnings. On average, according to the sample, the estimated return on a college education was 43% more than a high school degree (quotient value of 1.43). The average return on a university education, on the other hand, is 118% greater than the estimated average high school salary (quotient value of 2.18).

The frequency distribution between the college return and the university return is different. The frequency of quotients less than 1 for the college return is higher than the university return. A value less than one indicate that the respondent estimated that the high school grad would be earning more than the college or university grad. Approximately 20% of the sample has a college value less than 1, whereas the frequency of university returns less than 1 is about 10%. The peak for the college return is in bin 1.25-1.5; approximately 22% of the sample is located in this bin. The university distribution, on the other hand, is far more even. None of the bin frequencies for the university return exceed 10% and the majority of the university return sample is located in the 1.5-2.5 bin range. In contrast, the majority of the college distribution is located in the 1-2 in range. Figure 2 displays the income expectations, conditional on hypothetical education attainment.

Notes: The figures show the distribution of responses to imputed returns to college and university (expected), relative to high school education. Each participant's reported expected income if graduating from college or university is divided by his reported expected income as a high school graduate. The distribution of these variables is shown in Figure A for the imputed returns to college, and in Figure B for the imputed returns to university. The vertical line indicates the average response.

Those students who are unsure about their educational attainment reported higher expected income for each level of education than the sample mean. This sample estimated that a high school graduate would earn about $39,000 and a college graduate would earn approximately $51,000. The return on a university degree for this group was only $1,000 higher than the sample mean. Table 2 displays the mean expected income based on hypothetical education attainment status.

Perceived Barriers to Post-Secondary Education

In the second survey, participants were asked "What do you think is the main reason why some people don't go to post-secondary education?" Half of the control sample responded that "tuition and other costs are too high" is the main reason for not enrolling in post-secondary education. The frequency of this response for students expecting to get a high school diploma or college degree is lower than the sample mean. Only 41.7% of those expecting to get a high school diploma and 37.9% of those expecting to get a college degree thought that costs are the primary barrier to post-secondary education. About 60% of students who are unsure about their educational attainment level thought that tuition was the prohibitive factor to post-secondary education.

Only 1% of the university sample thought that the primary reason for not going to post-secondary education is that "job opportunities are not much better after going to college or university". In contrast, 8.3% of the high school sample and 10.3% of the college sample thought this was the reason students don't attend.

Not surprisingly 16.7% of the high school sample sited "school sucks" as the reason people don't attend post-secondary education. The frequencies to this answer are 5% and 10% lower for the high school and university sample, respectively. Table 3 displays the frequency.

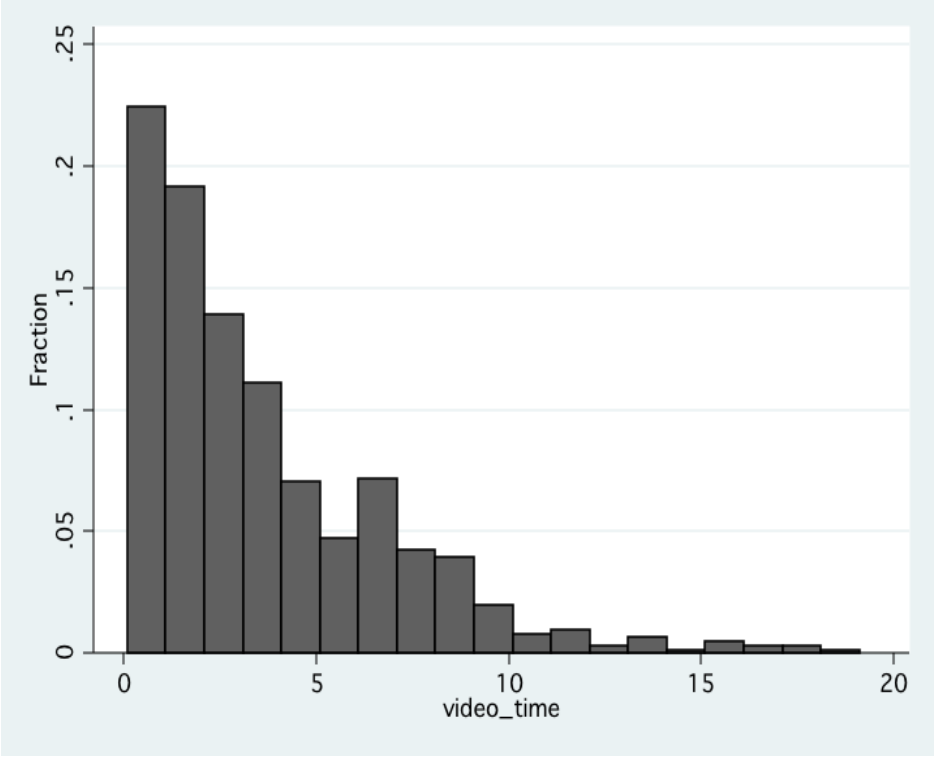
Treatment Characteristics

After the first survey, the treatment group was provided with information about post-secondary education in the form of a video and a script (for those who did not have speakers). The run time on the video was approximately 3 minutes. In conjunction with the video, the treatment group

was also provided with a simplified financial aid calculator to estimate their potential aid package. Students were able to proceed to the final survey page before the video had completed The median treated student watched most of the video. However, many students spent only one or two minutes on the web page before logging out or moving on the to the next web page. Since students were provided with the text to the video, there is the potential that student read the treatment instead of watching it. In addition, 25 percent of students spent more than 5 minutes on this page. A few even spent more than 10 minutes. Figure 3 displays the distribution of minutes spent on the video page by the treatment participants.

Figure 3

Distribution of Minutes Spent on Video Page, Treated Participants



Notes: Treated participants were shown a multimedia page about the costs, benefits, and access to financial aid for Post Secondary Education. The figure shows the distribution of the minutes that students spend on this page

Students in the treatment group that expect to go to university spent an average of 4.11 minutes on the treatment page. Students in the treatment group that do not expect to go to post-secondary education after high school spent 4.23 minutes on the treatment page. Those expecting to go to college or are unsure of their educational attainment spent a little less time on the treatment page than university group – the college sample spent 4.04 minutes on the page and the unsure sample spent 3.94 minutes on the treatment page.

There was a significant difference in the time spent on the treatment page by the grade 12 students in the treatment group and grade 9 students in the treatment group. Grade 9 students spent 0.28 minutes less on the treatment page than the grade 12 group. This is interesting because as displayed in the demographic data, the grade 12 population tends to know a bit more about grants and financial aid than the other grade samples. Students who might be applying to post-secondary education in the near future spent more time watching the video or using the financial aid calculator.

The educational attainment of parents also influenced the time spent on the treatment page. If a student has a father with a university degree, they spent 0.38 more minutes on the treatment page than the rest of the sample. Table 4 displays the results of regression of video exposure time on background characteristics among treated sample.

The participation attrition rate from the first survey to the second survey was 35%. Of the 1374 unique students who took the first survey, only 65% completed the second survey. Importantly, there is no difference in second survey participation between the treated group and the control group - both groups were as likely to participate in the second survey. Moreover, controlling for the various background characteristics does not yield differences in the second survey participation rate for the sample. The data indicate that second survey participation in a random event which is not contingent upon the treatment or any other student attributes. Table 5 displays the results of a regression of second survey participation status on program assignment and other background characteristics.

Perceived Returns on Education for the Treatment and Control Groups

The estimated return on education is derived by dividing the expected college or university salary at age 35 by the expected high school salary at age 35. This calculation is used to derive the values in Figure 3, however, Figure 3 displayed the frequency of responses and the mean for the entire sample. It did not include the split between the treatment and control groups. The control mean for the expected returns to college is 1.7; the treatment group mean is higher with a value of 1.83. Those who received the treatment estimated a higher average salary than the control group.

When the students who expect to go to university are removed from the sample, the differences between the treatment group and control group increase. Once the university students are removed, the control group mean holds constant at 1.7; the treatment mean, on the other hand, increases significantly to 2.1.

The differences between the control and treatment further widen when all students who plan on attending post-secondary education are removed from the sample. In this case, the sample is decreased to only 114 observations, but the treatment effect increases to 0.789 higher than the control mean with a value of 2.29.

The difference between the entire control group and entire treatment group estimated university returns is not significantly different. The control mean is 2.70; the treatment mean is 2.67. Like the college returns, when the students expecting to go to university and post-secondary educational are removed for the sample the differences in the expected returns significantly

increase. If the university students are removed from the sample, the expected university return control mean is 2.6. The treatment mean, conversely, is .517 higher than the control mean. When all students planning on attending post-secondary education are removed from the sample the control mean drops to 2.0; however the increase in the treatment mean is 1.06. Students who do not plan on attending post-secondary education expect returns on a university education of 100% (control group) and 200% (treatment group).

In the second survey, students were asked to estimate the lifetime returns on a university education. The question asked: "Over a lifetime, how much more do you think a typical Canadian would earn with a four-year undergraduate degree compared to someone with a high school degree?". Respondents were given a drop down list with a series of answers starting at "Would earn less", "$0", and "$1"; from there the list increases in $50,000 increments and ends at "greater than $1,000,000".

There are some differences in the responses to this question from the treatment group and the control group. 10% of the control group stated that the lifetime earnings of a university grad would be greater than $900,000; in contrast, 17% of the treatment group stated that the lifetime earnings would be greater than $900,000. Culling the groups according to expected educational attainment does not yield a different response, in fact as the controls based on educational attainment are applied the difference between the control and treatment group begins to decrease. When the students who expect to go to university are excluded, the control mean is 10%, however, the treatment group mean slightly decreases to 16.5%. Furthermore, when all students who plan on attending post-secondary are excluded the control mean remains constant at 10% but the treatment mean drops to 14.6%. Regardless, in each case, the treatment mean is still higher than the control mean. Table 6 displays the estimated program effect on own expected returns to college and university.

Perceived Grant and Loan Eligibility for Treatment and Control Groups

In the second survey, students were asked the same questions regarding financial aid. In particular students were asked about their grant eligibility and the government guarantee of financial aid for qualified students. In the second survey, 47% of the control group said that they

were eligible for a grant. Conversely, 54% of the treatment group thought they were eligible to receive a grant. Only 11% of the treatment group though that they were ineligible to receive a grant and 35% were not sure. The control group numbers were slightly higher; 14% thought that they could not receive a grant and 39% were unsure if they would qualify to receive a grant.
If the students expecting to go to university or college are excluded from the sample, the data show a different picture. Excluding the students who expect to go to university, 31% of the control group believe they are eligible to receive a grant in Ontario - that is a 15% drop from the total sample mean. Moreover, of this control group subset, 20% thought that they would not be eligible to receive a grant and 49% were unsure of their eligibility status.

The treatment group without those expecting to university observed a drop in perceived grant eligibly but not to the same degree as the control group. Of those expecting to stop after high school, go to college, or are unsure of their educational attainment, 45% thought that they would be eligible to receive a grant, 15% thought that they would be ineligible to receive a grant and 40% were unsure of their status. The treatment group is far more optimistic about their grant eligibility status but this subset is not as sure as the entire treatment sample.

The perceived grant status of students not expecting to attend a post-secondary education is not as high as the entire sample but very close to the sample that excludes students expecting to go to university. The control group means for the sample excluding university students and students expecting to go to post-secondary education are within two percentage points of each other. The treatment group means are slightly higher than the control group means for this specific sample. Of the students who do not expect to get any post secondary education 38% think that they would be eligible for a grant, 14.3% think that they would not be eligible for a grant and 47% don't know.

When expected education is the control, both the treatment and control group observe reductions in students that believe they are eligible for grants. However, in each dataset the treatment group has a higher percentage of students believing that they are eligible for a grant and a lower percentage believing that they are ineligible for a grant.

In the first and second survey, students were asked what they believed to be the primary reason a student would not enroll in post-secondary education. The survey 1 data are displayed in Table 3. In the first survey students identified costs as the primary barrier to post secondary

education; in the second the result was no different – costs were perceived as the primary barrier to university and college.

In the second survey, the 50% of the control group answered that costs are the primary barrier to post-secondary education – the same percentage of the treatment group though this was the primary barrier. If the students expecting to attend university are eliminated from the sample, the results are quite different. In this subset, 52% of the control group identified costs as the primary reason people don't attend post-secondary education. Only 42% of the treatment group identified this as the primary reason. If we eliminate all students planning on going to post-secondary education, the same observations occur. Approximately 60% of the control group that does not expect to attend post-secondary identified costs as the barrier, however, only 40% of the treatment group said costs were the reason. The subsets of the treatment group overwhelmingly identified the sticker price of education as the primary reason students don't attend, however it was a lower response frequency than the control group subsets. Table 7 displays the estimated program effect on financial aid expectations.

Educational Attainment Differences for the Treatment and Control Groups

It appears that those who received the treatment were less likely to be indecisive about the highest level of post-secondary education. In the first and second survey students were asked to identify the highest level of education they expect to receive. Students in the treatment group were less likely to select "not sure" as the option for post-secondary. In addition, the percentage of students in the treatment group that selected "college" as the highest level of education is higher than the control group.

If the data is controlled according to the expected educational attainment responses in the first survey, then the resulting data indicate a similar change between the control and treatment groups. If the respondents in the first survey who identified university as their highest expected level of education are eliminated from the sample, the frequency of "unsure "students for the treatment group is significantly smaller than the control group – the control group frequency is about one-third and the treatment frequency is approximately one-quarter. Furthermore, in this subset, there are a higher number of treatment respondents than control respondents who indicate that college is their highest expected level of education. Controlling the data by eliminating all

students in the first survey who indicate that they would attend post-secondary yield a similar result - the frequency of treatment respondents in the "unsure" category is less than the control group, and the frequency of treatment respondents who indicated that college is there highest expected educational attainment level is higher in the treatment group than the control group.

The data indicate that the treatment influenced students to choose a post-secondary option instead of stating that they were "unsure". Moreover, the treatment also increased the frequency of college respondents. Perhaps the information in the treatment influenced students' decisions to attend post-secondary education and college, presenting a potentially viable option for encouraging this behaviour. Table 8 displays the estimated program effect on education aspirations.

Requested Information about Post-Secondary Education

The measure of behavioural change is the selection of additional information between the control group and treatment group. At the end of the second survey students were provided with the opportunity to request more information; students could download a PDF with information about post-secondary education, or they could request to be sent information about universities and colleges in Ontario. An equal percentage of the control and treatment sample selected the PDF. The equal frequency can be attributed to the fact that students who are planning on attending post-secondary education presumably already have information about the application process. The decision has already been made; the treatment does not impact application behaviour for this population.

However, if we narrow the sample by eliminating the students expecting to go to university, there is a distinct difference between the control and treatment group. Roughly 17% of the treatment group chose to download the PDF file – this is double the frequency of control group participants that downloaded the file. Eliminating all students planning on attending post-secondary education generates the same result – the treatment download frequency is almost double the control download frequency. Clearly, there is a behavioural change for the survey participants that do not plan on attending university.

The other behaviour measured in the second survey is the decision to request more information about specific colleges and universities in Ontario. The percentage of both the

control and treatment group that requested more information is substantially higher than the percentage of both populations that selected to download the PDF. 76% of the entire control group requested more information about universities and colleges in Ontario; the treatment group frequency was 1% higher than the control group frequency.

As the sample is narrowed, again, the treatment frequency is higher than the control frequency. Only 71% of the subset of the control sample asked to receive more information about universities and colleges in Ontario; whereas, 81% of the treatment subsample requested information. More interesting data is generated when all students planning on attending post-secondary are eliminated from the sample. Of the students not planning on attending university or college, 74% of the control sample requested more information and 88% of the treatment sample requested more information. Clearly, the intended effects of the treatment worked on the students that said they would not be attending post-secondary. The behaviour of this population of students changed based upon the information they received in the treatment. The data indicate that the majority of this sample wanted to receive information about colleges and universities in Ontario. Table 9 displays the estimated program effect on own expected returns to college and university.

V. Discussion and Conclusion

In this paper, we explored how small differences in the way information about PSE is provided can influence high school students' interests and expectations in attending. We asked students from disadvantaged high schools to go on the Internet and take two short surveys, offering $20 for their participation. About half, randomly selected, were shown a multi-media page at the end of the second survey, with an easy to follow 3 minute video describing costs and benefits of PSE, and how to afford it. Students could also follow along the video with text provided beside it, and estimate their own financial aid eligibility with a financial aid calculator that only required approximating household income and family size.

Despite large attrition rates of students invited to go online, and attrition rates between the first and second survey (that were not related to whether a student was shown the video), the results point clearly to the conclusion that information and the way it is provided matters. Students that took the first survey and were exposed to the additional information about PSE were, three weeks later, significantly more likely to say they aspired to complete at least a college degree, had higher expectations of their own returns to PSE, were more likely to believe they were eligible for grants, and less likely to believe the main reason students don't go to on to PSE is because of costs. Moreover, these students were more likely to download an additional document that offered additional (and printable) information about PSE, and were more likely to request additional information about specific colleges and universities. These results were driven mostly by students who initially said in the first survey they were unsure about their education aspirations, or who intended to stop after high school, which is consistent with our expectation that those most likely to react to this information are those least interested in going in the first place.

The type of information we provided to selected students is readily accessible online and likely obtainable by talking with a high school guidance counselor. Most students report they already believe they would earn significantly more by completing PSE (and those in our treated group expect an even higher return). The type of financial aid calculator we presented is also accessible online. One explanation why students reacted to the information we provided is that we did not require them to seek it out. A common finding from research in Social Psychology is

that individuals tend towards the status-quo (e.g. Thaler and Sunstein, 2008). In our context, the status-quo for high school students is not to apply to PSE and not to receive information about PSE, except what is presented in class. In an environment where day-to-day distractions are common, adolescents may easily put off learning more about PSE, especially without additional interest by family and peers.

Students shown the additional information may also have become more salient to the benefits and affordability of PSE. Students may identify with themselves in different ways (someone who likes to have fun, plays soccer, or who wants to have a successful career, for example). Each of these identities can be more or less salient at any moment of time and the relative salience of different identities can significantly affect behavior (Akerlof and Kranton, 2002, McLeish and Oxoby, 2008). Perhaps treated students were more salient of the importance of PSE for future well-being, and that this additional saliency lasted while they took the second survey (or reoccurred when they took it). Frequent reminders to students on the benefits and affordability of PSE (regular campus visits, posters, for example) may improve students' interest in going at a time when PSE-related decisions are being made.

We find that providing simplified information about PSE to students online can affect short-term interest in going. Still, would providing this kind of information affect whether students actually attend or graduate PSE? And is there a better approach for trying to reach the many students who did not bother to go online or watch the video? Another randomized field experiment being evaluated by one of this paper's authors (Oreopoulos) looks at this by providing help to low income families in completing and submitting the Free Application for Federal Student Aid (FAFSA) to the U.S. Department of Education. The FAFSA contains more than 120 questions, including several about asset accumulation, expectations on being in the military, and whether ever convicted for drug use. Many researchers and policy makers believe the application is too complex and consequently impedes access (Dynarski and Scott-Clayton, 2006). The H&R Block College Enrollment Study offers assistance in filling out the FAFSA to randomly selected participants who are from low-income households and have not completed a college degree. Information collected while completing annual tax forms is used to fill about 70 percent of the FAFSA questions. The tax professional asks the participant about 5 minutes of remaining questions needed to complete the entire form. Participants leave the office with a simplified estimate of their grant and loan eligibility and a comparison of aid with costs in

attending local colleges full or part-time. The FAFSA is either filed electronically on the participant's behalf, or sent to him or her to be signed and mailed to the Department of Education directly with a pre-paid envelope. Early results suggest that this program significantly increases both PSE enrollment and grant-aid receipt. The study provides further evidence that small differences in how information is provided or how simple it is to apply can make large differences in people's lives.

Our findings corroborate with other studies, and point to some suggestions for increasing PSE enrollment. First, students should be provided with simplified information about costs, benefits, and accessibility of PSE frequently and early. We conjecture that visits every year to both 2-year colleges and 4-year universities would increase PSE salience substantially. Presentations during these visits or from peers that have gone on to complete PSE about costs and benefits of going could further increase interest. The application process both for student aid and university attendance should be make as simple as possible, and free. Our results suggest that all grade 12 students should be guided through the PSE application process, even for those who don't currently have plans to go. The financial aid process should also be completed early, so that students learn about aid eligibility in time to decide whether such aid can help them go. These recommendations are more speculative, because they involve programs that have not yet been directly tested. We believe, however, our results are generalizable enough to expect these recommendations offer cost-effective ways to increase access to PSE.

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TABLE 1

Descriptive Mean Statistics From Survey 1 Participants, by Grade Level

	Full Sample	Grade 9	Grade 10	Grade 11	Grade 12
	Background Characteristics				
Female	0.541	0.504	0.576	0.569	0.533
Born in Canada	0.586	0.615	0.675	0.545	0.520
Parents Born in Canada	0.054	0.043	0.075	0.043	0.057
Mom with University	0.213	0.186	0.214	0.207	0.245
Dad with University	0.308	0.305	0.278	0.311	0.332
Mom with HS or less	0.410	0.388	0.431	0.415	0.415
Dad with HS or less	0.093	0.071	0.122	0.090	0.097
Self Reported Grade Last Year	78.0	79.1	77.9	78.1	76.9
	Schooling Aspirations				
Ever Thought of Dropping Out	0.057	0.086	0.075	0.040	0.029
Highest Exp. Degree is HS	0.028	0.035	0.031	0.033	0.016
Highest Exp. Degree is any PSE	0.863	0.834	0.844	0.866	0.906
Highest Exp. Degree is Univ.	0.775	0.766	0.756	0.783	0.794
Unsure About Highest Degree	0.079	0.101	0.095	0.080	0.042
Aware of Financial Aid Guarantee	0.135	0.126	0.129	0.124	0.157
Believes Grant Elligible	0.416	0.436	0.393	0.344	0.470
Unsure About Grant Elligibility	0.432	0.436	0.451	0.478	0.376
Treated (Shown Video)	0.503	0.496	0.471	0.508	0.530
Took Second Survey	0.651	0.557	0.695	0.669	0.700
Sample Size	1374	397	295	299	383

TABLE 2
Mean Expected Income, Based on Hypothetical Education Attainment Status

Expected Earnings	**Highest Expected Degree**				
	Full Sample	**High School**	**College**	**University**	**Unsure**
High School Graduate	$36.529	$31,042	$30,086	$36,526	$39,392
2-Year College Graduate	$46,120	$40,000	$43,190	$45,769	$50,676
4-Year University Graduate	$62,685	$44,318	$58,056	$63,507	$63,750
Sample Size	443	12	29	349	37

Notes: The figures show the mean responses to income expectations (at age 35) by hypothetical education attainment (rows), and expected education attainment (columns). For example, the mean income from graduating with a 2-year college degree expected by those who expect to graduate only from high school is $40,000. See text for more details.

TABLE 3

Frequency Responses for Reasons Why Some Don't Enroll in Post Secondary Education Conditional on Highest Expected Degree

		Highest Expected Degree			
Percent Responding:	**Full Sample**	**High School**	**College**	**University**	**Unsure**
Job opportunities are not much better	2.5	8.3	10.3	0.9	5.4
Not everyone can get the grades required to qualify	30.6	33.3	31.0	32.3	24.3
Not sure	7.9	0.0	6.9	8.6	2.7
Other	3.4	0.0	3.5	3.7	2.7
School Sucks	5.6	16.7	10.3	5.1	5.4
Tuition and other costs are too high	49.8	41.7	37.9	49.1	59.5
Total	100	100	100	100	100
Sample Size	443	12	29	249	37

TABLE 4
Regression of Video Exposure Time on Background Characteristics Among Treated Sample

Dependent Variable is Time Elapsed on Video Page for Treated Sample, in minutes [standard deviation]		
	(1)	**(2)**
Constant (for Col. 1, Mean for Student Expecting to Graduate from University)	4.11 [0.184]***	9.07 [2.291]***
Highest Degree High School	0.12 [1.032]	-0.30 [1.083]
Highest Degree College	-0.07 [0.559]	-0.19 [0.589]
Unsure About Highest Degree	-0.17 [0.696]	-0.31 [0.704]
Grade Received Last Year		-0.03 [0.020]
Grade Level		-0.28 [0.144]*
Mom's Highest Degree High School		0.09 [0.350]
Dad's Highest Degree University		0.38 [0.388]
Sample Size	635	626

Notes: Column 1 and 2 shows the coefficient estimates and standard errors (in square brackets) from regressing the number of minutes treated participants spent on the multi-media webpage about post secondary education before closing. The independent variables are status indicators, except for Grade Level (9 to 12). One, two, and three asterisks indicate statistical significance at the 10%, 5%, and 15 levels.

TABLE 5
Regression of Second Survey Participation Status on Program Assignment And Other Background Characteristics

Dependent Variable is Dummy Indicator for Participation in Second Survey
[robust standard errors]

	(1)	**(2)**
Constant **(Control Mean for Col. 1)**	0.65 [0.018]***	-0.238 [0.166]
Treated	0.001 [0.026]	-0.003 [0.026]
Expected to Stop at High School		0.027 [0.087]
Unsure About Final Educ. Attainment		-0.023 [0.049]
Grade Received Last Year		0.005 [0.001]***
Grade Level		0.045 [0.011]***
Mom's Highest Degree High School		0.011 [0.027]
Dad's Highest Degree University		0.057 [0.029]**
Sample Size	1374	1348

Notes: Columns 1 and 2 shows the coefficient estimates and robust standard errors (in square brackets) from regressing an indicator for whether a participant in the first survey took the second survey. One, two, and three asterisks indicate statistical significance at the 10%, 55, and 15 levels.

TABLE 6
Estimated Program Effect on Own Expected Returns to College and University

	(1)	(2)	(3)	(4)	(5)	(6)
	Expected Returns to College		**Expected Returns to University**		**Lifetime Returns to University ≥ $900k**	
	Full Sample					
Control Mean	1.7		2.7		0.1	
Treatment Differences	0.132 [0.110]	0.14 [0.117]	-0.029 [0.204]	-0.045 [0.214]	0.07 [0.023]***	0.073 [0.023]***
With Controls?	No	Yes	No	Yes	No	Yes
Observations	890	876	841	827	894	897
	Excluding Students Expecting to Go to University					
Control Mean	1.7		2.6		0.1	
Treatment Difference	0.459 [0.254]*	0.439 [0.275]	0.517 [0.538]	0.392 [0.586]	0.065 [0.043]	0.075 [0.042]*
With Controls?	No	Yes	No	Yes	No	Yes
Observations	187	186	170	169	187	186
	Excluding Students Expecting to Go to PSE					
Control Mean	1.5		2.0		0.1	
Treatment Difference	0.788 [0.348]**	0.767 [0.360]**	1.056 [0.550]*	1.073 [0.641]*	0.046 [0.058]	0.058 [0.056]
With Controls?	No	Yes	No	Yes	No	Yes
Observations	114	113	102	101	114	113

Notes: The table reports treatment effect estimates with and without background controls, along with robust standard errors in square brackets. The controls are highest degree expectations from survey 1, an indicator for whether the participant's mother had completed any education beyond high school, whether the participant's father had a university degree, grade attained in the previous year, and level of grades. The table is divided into three separate parts, first including the full sample. Second the sample not expecting to complete a university degree, and third the sample not expecting to complete any post secondary education. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent levels, respectively. Expected Returns to College is the second survey response to the question about expected income if a student were to graduate from college divided by the income that say they would get if they only graduated from high school. Expected Returns to University is calculated the same, but with university income instead. Lifetime Returns to University≥$900k indicates whether a participant responded to a question on the total earnings difference over $900k.

TABLE 7
Estimated Program Effect on Financial Aid Expectations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Eligible for Grant		**Ineligible for Grant**		**Unsure About Grand Eligibility**		**Believe Ontario Guarantee**		**Costs Prevent Some from Going**	
	Full Sample									
Control Mean	0.466		0.14		0.39		0.081		0.498	
Treatment Difference	0.078 [0.033]**	0.088 [0.032]***	-0.033 [0.022]	-0.037 [0.021]*	-0.045 [0.032]	-0.049 [0.031]	0.014 [0.019]	0.015 [0.019]	-0.004 [0.033]	-0.002 [0.033]
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes		
Observations	894	894	894	894	894	894	894	894	894	894
	Excluding Students Expecting to Go to University									
Control Mean	0.309		0.202		0.489		0.053		0.521	
Treatment Difference	0.143 [0.071]**	0.151 [0.070]**	-0.052 [0.056]	-0.05 [0.055]	-0.092 [0.073]	-0.105 [0.071]	0.054 [0.040]	0.044 [0.038]	-0.102 [0.073]	-0.101 [0.073]
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes
Observations	187	187	187	187	187	187	187	187	187	187
	Excluding Students Expecting to Go to PSE									
Control Mean	0.292		0.2		0.508		0.031		0.585	
Treatment Difference	0.095 [0.090]	0.129 [0.088]	-0.057 [0.071]	-0.05 [0.068]	-0.038 [0.095]	-0.085 [0.091]	0.112 [0.055]**	0.102 [0.053]*	-0.197 [0.093]**	-0.195 [0.095]**
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes
Observations	114	114	114	114	114	114	114	114	114	114

TABLE 8
Estimated Program Effect on Education Aspirations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Unsure About Highest Degree Attainment		**Highest Degree High School or Less**		**Highest College Degree**		**Highest Degree University**	
	Full Sample							
Control Mean	0.128		0.05		0.05		0.771	
Treatment Difference	-0.055 [0.020]***	-0.041 [0.018]**	-0.007 [0.014]	-0.007 [0.013]	0.05 [0.018]***	0.053 [0.018]***	0.012 [0.028]	0.009 [0.022]
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes
Observations	894	894	894	894	894	894	894	894
	Excluding Students Expecting to Go to University							
Control Mean	0.34		0.181		0.223		0.255	
Treatment Difference	-0.104 [0.066]	-0.052 [0.062]	-0.063 [0.052]	-0.063 [0.047]	0.142 [0.0660]**	0.08 [0.063]	0.024 [0.065]	0.024 [0.065]
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes
Observations	187	187	187	187	187	187	187	187
	Excluding Students Expecting to Go to PSE							
Control Mean	0.431		0.185		0.092		0.292	
Treatment Difference	-0.145 [0.090]	-0.121 [0.085]	0.019 [0..076]	-0.007 [0.068]	0.112 [0.068]	0.112 [0.068]	0.014 [0.087]	0.014 [0.087]
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes
Observations	114	114	114	114	114	114	114	114

TABLE 9
Estimated Program Effect on Own Expected Returns to College and University

	(1)	(2)	(3)	(4)	(5)	(6)
	Clicked on PDF		**Requested Additional PSE Info**		**Lifetime Returns to University ≥$900k**	
	Full Sample					
Control Mean	0.185		0.761		20.145	
Treatment Difference	-0.005 [0.026]	-0.013 [0.026]	0.01 [0.028]	0.012 [0.029]	1.028 [0.562]*	0.563 [0.449]
With Controls?	No	Yes	No	Yes	No	Yes
Observations	894	879	894	879	872	862
	Excluding Students Expecting to Go to University					
Control Mean	0.085		0.713		75.188	
Treatment Difference	0.087 [0.049]*	0.08 [0.049]	0.094 [0.062]	0.128 [0.063]**	0.192 [1.390]	0.757 [1.235]
With Controls?	No	Yes	No	Yes	No	Yes
Observations	187	186	187	186	185	184
	Excluding Students Expecting to Go to PSE					
Control Mean	0.077		0.738		75.692	
Treatment Difference	0.066 [0.060]	0.066 [0.062]	0.139 [0.073]*	0.153 [0.073]**	-1.254 [2.117]	-0.263 [1.694]
With Controls?	No	Yes	No	Yes	No	Yes
Observations	114	113	114	113	114	113