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INFORMATION AND COLLEGE ACCESS: EVIDENCE FROM A RANDOMIZED FIELD EXPERIMENT

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ABSTRACT

High school students from disadvantaged high schools in Toronto were invited to take two surveys, about three weeks apart. Half of the students taking the first survey were also shown a 3 minute video about the benefits of post secondary education (PSE) and invited to try out a financial-aid calculator. Most students' perceived returns to PSE were high, even among those not expecting to continue. Those exposed to the video, especially those initially unsure about their own educational attainment, reported significantly higher expected returns, lower concerns about costs, and expressed greater likelihood of PSE attainment.

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I. Introduction

Many policy makers implicitly take as given that children and parents are fully informed when making education attainment decisions. In economics, we also often assume individuals have full information when deciding how much education to obtain or what programs to take up. Recent attention is being given to relaxing these assumptions, and the growing body of evidence suggests that many individuals are, in fact, not fully informed. This especially applies to those from low-income backgrounds. Kane and Avery (2004), for example, demonstrate that high school students from low-income family backgrounds have very little understanding of actual college tuition levels, financial aid opportunities, and the admissions process. A report by the Advisory Committee on Student Financial Assistance (2001) notes that students and families, as well as adult learners, are often intimidated by news stories about college being unaffordable. These stories may contribute to the fact that individuals often greatly overestimate the cost of higher education (Horn, Chen, and Chapman 2003). Usher (1998) finds that low-income individuals overestimate tuition costs by an average factor of two and underestimate the average annual income differential between high school and university graduates.

Misinformation or unawareness can lead to sub-optimal outcomes. High school students that view all post secondary programs as unaffordable may miss out on significant returns. On the other hand, students only focused on university options may struggle to complete and miss out on more enjoyable careers from vocational schooling or other community college options. One approach in addressing lack of information is through better advertizing. Currie (2004) and Dynarski (2002) find that better publicizing financial aid programs leads to higher take-up. Another approach is through simplification. Dynarski and Scott-Clayton (2006) demonstrate that

college financial aid eligibility in the United States can reasonably be explained on a post-card, matching up parents' adjusted gross income and adjusting for family size. Bettinger et al. (forthcoming) show that personal assistance in helping complete the financial aid application markedly increases PSE enrollment.

There is also evidence from developing countries that providing information about the benefits of PSE may increase motivation 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 figures reduced the large gap between perceived returns and the statistics provided, and, in addition, improved average test scores. Dinkelman and Martinez (2011), examined effects from showing Grade 8 Chilean students DVDs of young disadvantaged adults describing their path towards college or vocational schools. The authors show the presentation led to increased financial aid knowledge, decreased absenteeism, but little change in overall attainment expectations.

This paper adds to this literature by examining the effects from an internet information intervention on disadvantaged students in Toronto, Canada. We tested whether a short promotional video about higher education affects student interests and expectations about PSE. High school students from schools in low-income neighborhoods were invited to take two surveys that about three weeks apart. The first survey asked demographic questions and

questions about students' knowledge of PSE. A random half of the students who took the first survey were also shown a short video with accompanying text 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.

Despite the fact that students who received the online information could ignore it or skip quickly through it, the results are surprisingly clear cut in suggesting that the message mattered. Students exposed to the additional information about PSE, three weeks later, had higher expectations of their own return to PSE, were more likely to believe they were eligible for grants, were less likely to believe the main reason students do not go on to PSE is because of costs, and were more likely to say they aspired to complete at least a college degree. The effects were largest among those initially unsure about their education attainment decision, which is consistent with information-updating models like those discussed in Della Vigna and Gentzkow, (2010). We also find evidence that the intervention affects not just subjective responses but behavior. Treated 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. Overall, our study suggests inexpensive information campaigns to promote higher education are worth considering for promoting interest and access.

The next section outlines our experiment and theory of why it may impact students' decision making in the longer term. Section three describes our data. The fourth section presents results, and we conclude in section five.

II. The Experiment

The study was carried out in Toronto at 5 public schools, the maximum number our budget allowed. We chose schools in disadvantaged neighborhoods with the goal of targeting students unsure about their post secondary attainment or those expecting to enter the labor market with no more than a high school degree. According to a meta analysis based on academic performance, our five schools ranked 577, 669, 683, 706, and 707 out of all 718 public schools in Ontario (Cowley, Easton, and Thomas, 2012). Provincial statistics on these schools also show substantially lower percentages of students meeting province standards on grade 9 and grade 10 standardized tests. Their one-year transition rates to post secondary institutions for grade 12 students are among the lowest in the city, about 30 percent.

Between December 5th 2008 and January 20th 2009, homeroom teachers distributed postcard-sized flyers offering \$20 for participating in two online surveys (see appendix). All students were invited to participate 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.

Students that went online were briefed on the purpose of the study and invited to consent to participate. 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 payment to the participant. The first survey asked students a set of basic demographic questions about their education aspirations, parental education, ethnicity, and grade performance (the appendix includes the survey). It also asked questions about education attainment expectations

and participants' knowledge of their own financial aid eligibility. The survey concluded by asking students about why they expect or do not expect to enroll in a PSE program.

After answering the questions, a random half of participants were shown a screen with a video playing at the top left of the screen, a transcription of its text on the right to allow students to follow along and accommodate those without speakers, and a simple financial aid calculator at the bottom left of the screen. The video presented college and university in a positive light, suggesting that many students who are unsure about post-secondary education may overestimate costs or not realize financial aid eligibility. Mean earnings differences were presented for 35 year old Torontonians working with a high school degree, a 2-year college degree, or a 4-year university degree or more. The video was designed to convey key information about potential earnings differences by education attainment categories, as well as expected costs of PSE, and financial aid eligibility (see appendix for screen shot and text of video). Students had the ability to watch the video, as well as estimate the values of the grant and loan for which they would be eligible if they went to college or university. The financial aid calculator required students to estimate their parents' income and the number of siblings attending PSE. 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 page, the financial aid package for Toronto universities and colleges was provided as well as brief instructions about how to apply.

After trying out the financial aid calculator, students were asked to click 'done' when finished. They were then shown the same page as the control group thanking them for their participation and reminding them to expect a notice in three weeks about taking the second survey, along with a reminder that they would receive \$20 for completing the second survey

(sent electronically via internet banking, or students could opt to receive an amazon.ca gift certificate or donate \$20 to their school).

[Figure 1 about here]

Figure 1 shows the distribution of minutes spent exposed to the treatment webpage. The median treated student spends three minutes on the webpage, which was the same length of time as the video. Less than 10 percent watched for less than one minute, while another 10 percent spent at least 9 minutes watching. To explore whether particular types of students watched the video more, we regressed time spend watching the treatment webpage on background characteristics, but found surprisingly little relationship. Students' education attainment expectations were uncorrelated with video exposure time. Previous academic performance and parents' education attainment were also unrelated to time spend on the webpage. Only a students' grade level predicted treatment exposure time. Grade 12 students spend about a minute longer on the webpage than Grade 9 students.

About three weeks after completing the first survey, students were sent a reminder and link to the second survey. 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 attainment expectations.

We asked participants before being treated in the first survey whether they expected their highest degree to be from high school, a 2-year community college degree, a 4-year university degree or more, or whether they were unsure. A core prediction from belief-based models with Bayesian updating is that the information treatment will be more effective for those who are unsure (Della Vigna and Gentzkow, 2010). New information may cause some of these students

to favor more schooling while others less, depending on whether the net expected benefit is adjusted upwards or downwards. We might also observe some who initially report they intend to complete college or university degrees to adjust their expectations downwards if the video lowers their expected rate of return. Another possibility is that the online intervention advertizes higher education without providing significantly new information (Della Vigna and Gentzkow call these models preference-based). For example, a reminder that those with more schooling tend to earn more money may make the relationship more salient when thinking about one's own earnings outcome, even though the relationship itself is already known. We might expect in this case to observe changes in educational expectations without changes in expected costs or benefits, since the student receives no new information with which to update prior beliefs. However, observing changes in attainment expectations and returns does not necessarily lead to rejecting the preference-based model; students may still react to the reminder by inflating earnings expectations more. Preference and belief-based models are not easily distinguishable because it is often not clear whether advertizing provides new information or not.

The intervention's impact also depends on students' attention to the new information and interest in retaining it. The salience of the information when trying to decide and the costs involved from using the information may also play a role. We specifically chose a later date from the initial survey to test responses to the treatment in order to focus on delayed responses to information rather than immediate. We also provided an option for participants to indicate whether they wished to be sent more details regarding specific colleges or universities. Furthermore, students were able to download a PDF booklet about applying to post-secondary education. These 'action outcomes' were added to estimate effects beyond self-reported outcomes. A concern with subjective responses is that it is low cost for students to respond to

new information without being committed. While sample size and budget constraints prevented us from examining eventual education attainment (and earnings), examining treatment effects on these action outcomes provides at least some evidence on whether students meaningfully react to this intervention.

III. Descriptive Statistics

Table 1 describes the student characteristics of survey 1 participants. We delivered 5,017 postcard invitations to the participating schools, one for each student enrolled. 1,616 students completed the first survey. Since not all students received an invitation due to absences or compliance, the ratio of students responding to invitations distributed (32 percent) represents a lower bound for the response rate. The proportion of students by each grade is spread fairly even. Grade 9 and 12 students account for 28 and 29 percent of the sample respectively; and grade 10 and 11 students each account for 21 percent of the total sample. 54 percent are female. The average reported grade for the entire sample is 78 percent, suggesting students with above average academic ability were more likely to participate in the study. A very large fraction of respondents are first or second generation immigrants. Of the 1,616 respondents, 41 percent are immigrants, and only 7 percent have parents both born in Canada. The educational attainment levels for parents is also quite low: 32 percent of the sample report that their father has a university degree; 21 percent report that their mother has a university degree.

A large majority of participants, 85 percent, intend to obtain a college or university degree. This result is due in part to those responding being more likely interested in PSE to begin with (as indicated by the high average grade), but also due to the tendency for students'

expectations to exceed their actual education attainment. For example, Jacob and Wilder (2010) find 80 percent of recent high school students in the U.S. expect to attain a BA degree, whereas less than 40 percent actually reach this goal (and fewer still for blacks and males). The authors note a common explanation for this occurrence is that students underestimate the the difficulty in completing college or the preparation required to excel. Stinebrickner and Stinebrickner (2012) find some evidence this with updated learning about academic ability predicting PSE dropout. Other researchers model students as trying to conform to the attainment expectations of parents, teachers, and peers, while failing to account for preparation and difficulty entirely (Haller, 1982). Our treatment is unlikely to cause downward adjustment to attainment expectations because it provides no information about students' own abilities. However, expectations may still change because of remaining doubt about PSE or misinformation about costs and returns.

To explore the hypothesis that disadvantaged students who are unsure about their education attainment expectations or thinking about stopping at high school may be overestimating costs or underestimating returns, we separate treatment effect estimates for these subgroups from the majority expecting to obtain PSE degrees. It is unfortunate that the size of the sample reporting they intend to stop at high school is so low. We include results for this group for descriptive purposes, but keep them separate from those unsure in their expectations. The appendix shows treatment effects for these two groups combined.

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 are 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?". Responses to these questions allow one to calculate each participant's expected rate of return to college and university. Table 2 shows mean earnings for the control group, categorized by education attainment expectation reported in survey 1, as well as the earnings ratios between completing college versus high school and between completing university versus high school for the 10th, 50th, and 90th percentile in each group. Similar to previous studies (Dominitz and Manski, 1996, Betts, 1996, and Botelho and Pinto, 2003), students vary considerably in their responses but, on average, expected earnings by education attainment category are similar to actual mean differences observed (from the 2009 Labour Force Survey, the mean income for 34-year-old Torontonians ending school after high school, community college, and university is \$37,000, \$49,000, and \$59,000 respectively). Students generally predict higher earnings from greater schooling. Interestingly, the median return from college or university is substantial, regardless of education attainment intentions. The median student saying she expects to stop at high school also says she would earn 40 percent more with a 2-year college degree, and 107 percent more with a 4-year university degree. The median student expecting to obtain a 2-year college degree expects to earn 32 percent more if they received a university degree instead, and those unsure about their decision expect an average rate of return to college and university of 31 percent and 53 percent respectively. Since these results are self-reported, taking into account expected ability, they suggest that expected returns cannot explain why some students intend to stop their schooling short. While expected returns are high for the median in each group, they are negative for those in the 10th percentile.

A potential explanation for the high returns among students opting for less education is cost concerns. Table 3 reports results from surveying participants about why they think some do

not enroll in PSE (for the control group only). The most frequent reason regardless of own education expectations is cost. More than 60 percent of those unsure about their education attainment say tuition costs are too high for some to attend. The median expected rate of return to a university degree for these unsure students is 80 percent whereas the median for unsure students who do not identify cost as the main reason why some do not go is 18 percent. Participants indicate poor grades are the second key reason for why some do not go. For the small group reporting they plan to stop at high school, distaste for school is also an important explanatory factor.

Of those students who completed the first survey, 60.3 completed the second survey three weeks later. Importantly, the response rate to the second survey was very similar for the treatment and control groups (61.2 and 59.6 percent respectively). To further explore potential response bias, Table 4 presents mean differences in survey 1 background characteristics by treatment status. Not surprisingly, parents' education, initial education attainment expectations, gender, previous grades, and immigrant status are generally balanced between groups for those completing the first survey (before randomization). A few of these variables, however, are not balanced when conditioning on the sample of students responding to both surveys. The p-value from an F-test on the joint significance of these variables being different across treatment and control groups is 0.09. For the sub-sample initially unsure about their final education attainment, the p-value is 0.29.

We estimate treatment impacts with and without conditioning on the variables listed in Table 4. In addition, we follow two other approaches recommended by Puma et al. (2009) in addressing missing data after randomization. The appendix table shows our main results are robust to weighting observations by predicted probability of completing survey 2, and to

interacting each control variable with treatment status. The table indicates similar results for the sample of students initially unsure about their attainment plans and for the combined sample of those unsure and those planning on stopping with a high school degree.

IV Results

In this section we present our main program effect estimates. We first examine impacts on expected PSE benefits and costs to explore evidence of participants responding directly to the information provided. We then examine interest in PSE more directly by looking at program effects on attainment expectations and interest in acquiring more information about PSE.

Table 5 shows treatment effects on expected annual earnings at age 35, grouped by participants' highest expected degree reported in survey 1 (prior to treatment). The first panel displays results among those unsure about their schooling. As predicted, this group reacts more than the other participants with stronger priors. Column 1 indicates that those initially unsure and exposed to the online information subsequently report lower expected earnings from stopping at high school compared to the control group (\$34,512, on average versus \$43,542, p-value = 0.040). Including linear controls for background characteristics (the same variables listed in Table 4) does not substantially alter the estimates, which is the case for all outcomes examined in this section. Differences in expected earnings from completing a college or university degree are not significantly different between treated and control participants.

Overall, the results suggest that the online information changes students' expected rates of return to PSE from high to very high. Column 7 shows that the ratio between expected college and high school earnings is 40 percent higher for the treated group than the controls (2.1 versus

1.5, p-value = 0.050). The impact on the university-to-high-school expected earnings ratio is also substantial: 2.8 versus 1.9 (p-value = 0.036). The estimated college and university returns for the sample reporting an intention to stop at high school are high for both treatment and control groups (about 80 percent higher earnings from completing college and 140 percent higher earnings from completing university), but are measured imprecisely because of small sample size. We do not find any significant change in expected returns to college or university for the sample predicting to obtain some type of PSE degree. Interestingly, the estimated returns reported by this group are about the same as the returns reported by the students who intend to stop at high school.

Table 6 shows program effect estimates on survey responses related to PSE costs. The notable result is a significant fall in the number of unsure students indicating tuition and other costs as the main reason why some do not enroll in PSE. The fraction reporting that costs prevent some from going to PSE falls from 61.7 percent for the control group to 39.1 percent for the treated. The point estimates for the other cost-related outcomes are consistent with the possibility of unsure students also becoming more confident about being grant eligible, but the estimates are not statistically significant at the 10 percent level. The pattern is clearer for the larger sample of students reporting an intention in survey 1 to complete college or university. These students are about 7 percentage points more likely to believe they are eligible for grant aid three weeks after being shown our financial aid calculator and video. There is no significant change for this group in the fraction reporting cost as a factor in explaining why some do not attend PSE.

The results above suggest that being shown the online information caused the group unsure about their educational attainment to adjust their costs and benefits expectations of PSE

towards making the decision to attend seem more favorable... We do not observe any downward adjustment in expected returns or upward adjustment in expected costs from the video. In fact, students expressing the goal of completing a PSE degree appear more aware, after the treatment, of being eligible for financial aid. Correspondingly, Table 7 indicates a significant fall in education attainment uncertainty from the treatment for both students initially unsure and those aiming to go to PSE. Those unsure about their attainment prior to treatment are 18.5 percentage points less likely to express uncertainty three weeks after treatment (Column 1). Students from this group shift their response to indicating an expectation of obtaining a PSE degree more towards a 2-year college than a 4-year university. The results also show a program effect on attainment expectations for those initially saying they intend to complete PSE. 8.3 percent of these students in the control group change their response to the same question in the second survey and indicate being unsure. The program appears to reinforce students' resolve in this group towards PSE. 3.3 percent fewer report being unsure compared to the control group, while 3.5 percent more maintain their intention of obtaining a PSE degree.

At the end of the second survey students were provided with the opportunity to request more information; students could download an electronic document with information about PSE (e.g. with subsections titled 'Why should I go?', 'How do I apply?', 'How do I pay', and 'What colleges are near me?'). Students could also request to be sent information about a particular university or college by clicking boxes beside a list of regional schools. As mentioned in section II, the purpose of recording who accessed this information was to test whether the program affected more than just subjective survey responses. Table 8 presents these results, along with program effect estimates on expected grade. For students initially unsure about attainment and expecting to stop at high school, we observe a higher fraction of those from the treatment group

downloading the PSE document and requesting school information. The fraction requesting more school information almost doubles for the treated group with initial expectations of stopping at high school, compared to the control group. The other outcome differences are not large enough to reject the hypothesis that they occurred by chance. If we combine these two groups (those unsure and those intending to stop at high school) however, the gap in the fraction downloading the electronic document is statistically significant at the 10 percent level (see appendix).

Of interest is how our results differ by age or gender. Unfortunately, a small sample size generally prevents us from conducting subgroup analyses. We do not find strong support for the possibility that students in later grades are less impacted because they are more informed. In fact, while the estimated treatment effect on expected returns to PSE for the unsure sample is smaller for Grade 12's than those in lower grades, the effects on cost concerns and attainment expectations are higher (though we cannot reject that the two effects are equal). We also cannot reject that the main effects by gender are equal (because they have large standard errors associated with them).

V. Discussion and Conclusion

In this paper, we present results from a small field experiment in which students from disadvantaged high schools were invited to go on the Internet and take two short surveys. The students were offered \$20 for their participation. At the end of the first survey, a random half were shown a multi-media page with an easy to follow 3 minute video describing costs and benefits of PSE, and how to make PSE affordable. Students could also follow along with the

text provided beside the video, and estimate their own financial aid eligibility with a financial aid calculator that only required approximating household income and family size. Three weeks later, students were asked to complete a second survey, which asked questions about students' impressions of PSE costs and benefits, as well as their own education attainment expectations.

The purpose of this study was not to design a nationally scalable policy that would lead to substantial increases in PSE enrollment and completion, but rather to test whether exposing students from disadvantaged backgrounds to online information might play a role in affecting prior beliefs about PSE and increase (or perhaps decrease) their interest in going. Stakes were generally low for the participants: there was no cost for treated respondents to skip over the information page provided (though they may have assumed they needed to do this to remain eligible for participation payment). There was also little cost in deciding how to respond subjectively to the questions or whether to choose to receive additional information.

In this setting, we can classify the study as a <u>framed field experiment</u>, using the dichotomy outlined by Harrison and List (2004). Participants dealt with a subject of interest outside the experiment (their own education), but not in an environment where they would naturally undertake the task of thinking about their long-term plans. A video shown in class or a homework assignment to estimate one's own financial aid eligibility would more closely resemble a real program. We cannot rule out the possibility that some students responded according to what they thought the researchers wanted to observe. But this possibility was likely similar for the control group, who were also aware they were participating in a study about PSE and 'life after high school'. The three weeks between surveys allowed for both treated and control students to get back to their daily lives before being surveyed again. The responses themselves seem reasonable. In addition, the measured outcome of accessing additional PSE

information requires more action and thus, at least slightly, greater cost than not accessing at all.

Despite the intervention lasting only a few minutes and waiting three weeks before estimating impacts, the results suggest that providing easily accessible information about PSE matters, especially for those initially uncertain about whether they want to go or can afford PSE. These students were more likely to adjust their cost concerns downwards and their own expected return from going upwards from the online information. Correspondingly, this group expressed less uncertainty and more subsequent interest in completing a PSE degree. We also found some evidence that those treated were more likely to seek out additional information about next steps in how to enroll in PSE and how to access financial aid.

Much of the 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.

Our findings appear more consistent with belief-based models where students' priors are updated after receiving new information rather than preference-based models where the treatment promotes PSE without providing new information. This is because we observe students adjusting both their expectations about net benefits and about education attainment rather than just education attainment on its own.

Our findings show students react favorably to information promoting higher levels of schooling, consistent with results from Jensen (2010), Nguyen (2007), and Dinkelman and Martinez (2011). Taken overall, they suggest inexpensive information programs may facilitate transitions from high school to college. Videos, websites, or presentations, especially at times when students must make decisions affecting PSE outcomes, may lead to higher PSE enrollment and degree completion.

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Table 1
Descriptive Statistics From Survey 1 Participants, by Grade Level

	(1)	(2)	(3)	(4)	(5)
	Full Sample	Grade 9	Grade 10	Grade 11	Grade 12
		Backgro	ound Charact	eristics	
Female	0.520	0.497	0.592	0.538	0.479
Born in Canada	0.586	0.630	0.672	0.552	0.506
Parents Born in Canada	0.066	0.046	0.074	0.057	0.085
Mother with University	0.210	0.190	0.195	0.215	0.241
Father with University	0.317	0.304	0.266	0.334	0.355
Mother with High School or Less	0.407	0.389	0.444	0.391	0.408
Father with High School or Less	0.088	0.072	0.112	0.085	0.088
Self Reported Grade Last Year (percent)	78.2	79.6	78.4	78.6	76.3
(percent)		Scho	oling Aspirat	ions	
Highest Exp. Degree is HS	0.030	0.033	0.044	0.031	0.015
Highest Exp. Degree is Coll.	0.851	0.842	0.828	0.844	0.882
Highest Exp. Degree is Univ.	0.762	0.768	0.742	0.768	0.767
Unsure About Highest Degree	0.119	0.125	0.127	0.125	0.103
		Financ	cial Aid Awar	eness	
Aware of Financial Aid Guarantee	0.142	0.138	0.154	0.113	0.160
Believes Grant Elligible	0.412	0.425	0.388	0.354	0.462
Unsure About Grant Elligibility	0.433	0.444	0.441	0.482	0.378
		Tre	eatment Stat	us	
Treated (Shown Video)	0.498	0.486	0.479	0.499	0.524
Took Second Survey	0.603	0.540	0.642	0.615	0.628
Sample Size	1616	457	338	353	468

Notes: Exp. = Experience, HS = High School, Coll. = College, and Univ. = University.

Mean Expected Earnings and Ratio of Expected PSE-to-High-School Earnings for 10th, 50th, and 90 Percentiles By Highest Expected Degree (Control Sample) Table 2

	(1)	(2)	(3) (4) Highest Expected Degree	(4) cted Degree	(5)
Mean Expected Earnings if:	Full Sample	High School	College	University	Unsure
High School Graduate	\$37,381	\$28,077	\$30,083	\$37,303	\$43,542
2-Year College Graduate	\$46,639	\$37,500	\$44,417	\$46,214	\$52,417
4-Year University Graduate	\$61,328	\$41,731	\$57,083	\$62,309	\$61,500
Ratio of Expected College to High School Earnings 10th, 50th, and 90th percentiles	[0.72 1.36 2.5]	[0.85 1.4 2.5]	[0.83 1.57 3.07]	[0.66 1.36 2.5]	[0.72 1.31 2.14]
Ratio of Expected University to High School Earnings 10th, 50th, and 90th percentiles	[0.97 1.88 3.8]	[0.54 2.07 4.5]	[0.92 1.83 8.15]	[1.0 1.91 3.8]	[0.79 1.53 3.4]
Sample Size	483	13	30	380	09

program?" The top of the table shows mean responses for the control group sample categorized by highest expected degree. The bottom of the table shows the expected return to a college or university degree (relative to completing only a high school degree) expressed as an Notes: Students were informed that average earnings for a 35 year-old in Toronto is about \$38,000. They were then asked, "Suppose that age 35?" and "How much do you think you would earn if instead you were to complete a two-year college (or four-year university) 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 earnings ratio for the 10th, 50th, and 90th percentile in each subgroup respectively.

Table 3
Frequency Responses for Reasons Why Some Don't Enroll in Post Secondary Education
Conditional on Highest Expected Degree (Control Sample)

	(1)	(6)	(3)	(*)	(E)
			Highest Exp	(3) Highest Expected Degree	(c)
Percent Responding:	Full Sample	High School	College	University	Unsure
Job opportunities are not much better	2.5	7.7	10.0	0.8	8.3
Not everyone can get the grades to go	30.6	30.8	36.7	32.4	16.7
Not sure	7.9	0.0	6.7	8.7	5.0
Other	3.9	0.0	3.3	4.5	1.7
School sucks	6.4	15.4	10.0	5.8	9.9
Tuition and other costs are too high	48.7	46.1	33.3	47.9	61.7
Total	100.0	100	100	100	100
Sample Size	483	13	30	380	09

Table 4
Survey 1 Mean Characteristics by Treatment Status, Second Survey Response,
And Whether Unsure about Final Education Attainmetn in Survey 1

	(1)	(2)	(3)	(4)	(5)	(9)
	Responded (Initial	Responded to 1st Survey (Initial Sample)	Responded to 1	Responded to 1st and 2nd Survey	Responded to 1: Unsure About Exp	Responded to 1st and 2nd Survey Unsure About Expected Ed. Attainment
	Control Group (Variable Mean)	Treatment Group (Mean Difference Compared to Controls)	Control Group (Variable Mean)	Treatment Group (Mean Difference Compared to Controls)	Control Group (Variable Mean)	Treatment Group (Mean Difference Compared to Controls)
Female	0.536	-0.032 [0.025]	0.579	-0.055	0.63	-0.13 [0.106]
Born In Canada	0.572	0.028 [0.025]	0.563	0.064	0.685	0.104 [0.092]
Grade Last Year (percent)	78.089	0.194 [0.497]	78.681	0.513 [0.616]	74.398	0.668
Mother's Highest Degree University	0.206	0.009	0.235	-0.022 [0.028]	0.093	0.013 [0.064]
Father's Highest Degree University	0.334	-0.034 [0.023]	0.357	-0.057 [0.031]*	0.167	0.018 [0.082]
Ever Thought of Dropping Out	0.079	-0.018 [0.013]	0.049	-0.001	0.074	-0.048 [0.045]
Believes Government Guarantees College Access	0.141	0.004	0.135	-0.006 [0.023]	0.519	0.192 [0.101]*
Unsure About Grant Elligibility	0.436	-0.008 [0.025]	0.404	0.018	_	0
Highest Degree Expected Unsure	0.129	-0.021 [0.016]	0.12	-0.036 [0.020]*		
Highest Degree Expected High School	0.03	0 [0.008]	0.027	0 [0.011]		
Highest Degree Expected 2-year College	980.0	0.006 [0.014]	0.064	0.03		
Highest Degree Expected University	0.755	0.016 [0.021]	0.789	0.007		
Responded to Second Survey	0.596	0.016 [0.024]				
Joint Test for Significance (p-value from F-Test)		0.484		660.0		0.287
Sample Size		1,616		975		101

Notes: Means between treatment and control sample are calculated for each variable. The estimated standard error for the difference between treatment and control mean is shown in square brackets. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent levels respectively. The Joint Test for Significance is caculated first by regressing treatment status on all listed variables combined and conducting an F-Test for the hypothesis that all coefficients are zero. HS = High School

Table 5 Estimated Program Effect on Earnings and Returns to College and University

	(1)	(2)	(3)	(4)	(5)	(9)	(7)	(8)	(6)	(10)
	Expected Earnings from HS at Age 35	Earnings it Age 35	Expected Earnings From College at Age	oected Earnings College at Age 35	Expected Earnings from Univ. at Age 35	Earnings at Age 35	Expected Collto-HS Ratio at Age 35	ollto-HS Age 35	Expected Univto-HS Ratio at Age 35	nivto-HS Age 35
•			In Surv	ey 1 Unsure Ak	out Expected	Educational A	ttainment (Sa	n Survey 1 Unsure About Expected Educational Attainment (Sample Size = 101)		
Control Mean	43,542		52,417		61,500		1.5		1.9	
Treatment Difference	-9,029 [4,334]**	-8,245 [4,580]*	-3,270 [4,001]	-2,393 [4,076]	1,244 [3,357]	328 [3,170]	0.662	0.681 [0.340]**	0.995	0.974 [0.461]**
•			In Surv	ey 1 Expecting	Not to Compl	ete More than	High School (n Survey 1 Expecting Not to Complete More than High School (Sample Size = 25)		
Control Mean	28,077		37,500		41,731		1.8		2.4	
Treatment Difference	1,298 [8,118]	-627 [7,717]	8,542 [8,928]	2,545 [11,237]	5,478 [9,254]	294 [11,580]	0.251	0.162 [0.522]	-0.165	0.215 [0.842]
1			In Su	vey 1 Expectir	ng to Complet	e College or U	niversity (San	In Survey 1 Expecting to Complete College or University (Sample Size = 849)		
Control Mean	36,774		46,082		61,925		1.7		2.5	
Treatment Difference	-413 [1,463]	-418 [1,451]	1,196 [1,253]	817 [1,243]	-789 [1,118]	-913 [1,124]	0.026	0.025 [0.103]	-0.068	-0.055 [0.168]

last year (percent), indicators for whether mother and father's highest degrees were university, survey 1 reports on whether ever thought of dropping out of high school, whether government guarantees college access, and indicators for expected highest degree in survey 1 (unsure, high school, college, or university). Huber-White robust standard errors are shown in square brackets. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent levels respectively. Calculation of the variables 'Expected Returns to College and University' is described in more detail in Figure 1 and in the text. Coll. = 2-year college, HS = High School, Univ. = University Notes: Treatment difference with controls is the coefficient estimate for treated participants after regressing the outcome variable on it, plus linear controls for female, born in Canada, grade

Table 6
Estimated Program Effect on Financial Aid Expectations

	(1)	(2)	(5)	(9)	(7)	(8)	(6)	(10)
	Costs Prev From	Costs Prevent Some From Going	Believe Guara	Believe Ontario Guarantee	Unsure Al	Unsure About Grant Elligibility	Elligible	Elligible for Grant
	<u>=</u>	Survey 1 Ur	sure About E	Expected Edi	In Survey 1 Unsure About Expected Educational Attainment (Sample Size = 92)	ainment (Saı	mple Size = 9	2)
Control Mean	0.617		0.033		0.583		0.283	
Treatment Difference	-0.226 [0.100]**	-0.241 [0.105]**	0.064	0.04	-0.12	-0.134	0.083	0.072 [0.095]
	u I	Survey 1 Exp	ecting Not to	Complete	In Survey 1 Expecting Not to Complete More than High School (Sample Size = 24)	yh School (S	ample Size =	24)
Control Mean	0.462		0		0.231		0.308	
Treatment Difference	-0.045	0.015	0.333	0.374 [0.208]*	0.269	0.04	0.026 [0.195]	0.303
		n Survey 1 E	xpecting to (complete Co	In Survey 1 Expecting to Complete College or University (Sample Size = 791)	ersity (Samp	ole Size = 79′	<u> </u>
Control Mean	0.468		60.0		0.363		0.5	
Treatment Difference	0.026	0.025	0.003	0.011	-0.04	-0.043	0.065	0.078
With Controls?	No	Yes	No	Yes	No	Yes	Yes	Yes

Notes: Same as Table 6

Table 7
Estimated Program Effect on Education Aspirations

	(1)	(2)	(3)	(4)	(5)	(9)	(7)	(8)
	Unsure Ab Degree A	Unsure About Highest Degree Attainment	Highest High Scho	Highest Degree High School or Less	Highest Communi	Highest Degree Community College	Highes More than	Highest Degree More than High School
	<u> </u>	In Survey 1 Uns	sure About E	xpected Edi	1 Unsure About Expected Educational Attainment (Sample Size	ainment (San	Ш	92)
Control Mean	0.5		0.083		0.083		0.417	
Treatment Difference	-0.183 [0.098]*	-0.232 [0.102]**	0.014	0.006	0.112	0.148 [0.068]**	0.169	0.226 [0.103]**
	<u>-</u>	In Survey 1 Expo	ecting Not to	Complete	1 Expecting Not to Complete More than High School (Sample Size =	yh School (Sa	ample Size =	: 24)
Control Mean	0		0.538		0.154		0.462	
Treatment Difference	0.083	0 [0.000]	-0.038	-0.165	0.179 [0.176]	0.221	-0.045	0.165
		In Survey 1 Ex	rpecting to C	omplete Co	Expecting to Complete College or University (Sample Size =	ersity (Samp	le Size = 791)	1)
Control Mean	0.083		0.027		0.039		0.89	
Treatment Difference	-0.033 [0.017]*	-0.039 [0.017]**	-0.002	-0.004	0.05	0.031 [0.013]**	0.035 [0.020]*	0.043 [0.020]**
With Controls?	No	Yes	No	Yes	No	Yes	No	Yes
Motoc. Sample of Toble 6								

Notes: Sample as Table 6

Estimated Program Effect on Downloading Additional Information and Expected Grade Table 8

	(1)	(2)	(3)	(4)	(5)	(9)
	Clicked on PDF	PDF	Requested More Institutional Info.	d More nal Info.	Expected Grade This Year (percent)	Grade vercent)
In Surve	ey 1 Unsure A	bout Expected	Educational	In Survey 1 Unsure About Expected Educational Attainment (Sample Size = 92)	mple Size = 92	ລ
Control Mean	0.083		0.833		75.375	
Treatment Difference	0.063	0.084 [0.071]	0.02	0.038	0.966 [2.158]	-0.297 [1.722]
In Surve)		Not to Comple	te More than	\prime 1 Expecting Not to Complete More than High School (Sample Size = 24)	ample Size = 3	24)
Control Mean	0		0.462		73.654	
Treatment Difference	0.167	0.281 [0.198]	0.372 [0.183]*	0.589 [0.168]***	-5.529 [4.838]	-2.453 [7.172]
In Surv	vey 1 Expecti	ng to Complete	College or U	rey 1 Expecting to Complete College or University (Sample Size = 791)	ole Size = 791)	
Control Mean	0.202		0.783		81.146	
Treatment Difference	-0.029 [0.027]	-0.027 [0.027]	-0.011 [0.029]	-0.001	0.587	0.514 [0.454]
With Controls?	No	Yes	No	Yes	No	Yes

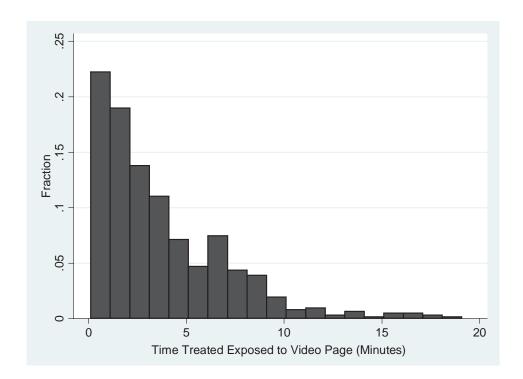
Notes: Same as Table 6. 'Clicked on PDF' indicates whether participant accessed downloadable information file about college and university at the end of Survey 2. Requested More Institutional Info. Indicates whether participant indicated at the end of Survey 2 an interest in receiving additional information about particular school.

Appendix Table Treatment Effect Estimates Using Alternative Adjustments for Missing Data

	(1)	(2)	(3)	(4)	(2)	(9)
	۵	In Survey 1 Unsure About Expected Educational Attainment	ıt ment		Excluding Students Expecting to go to College or University	gr ty
Outcome	Case Deletion	Weight Adjustment	Treatment/Covariate Interactions	Case Deletion	Weight Adjustment	Treatment/Covariate Interactions
Highest Degree Unsure	-0.232	-0.185 [0.099]*	-0.199 [0.107]*	-0.173 [0.085]**	-0.149	-0.161
Highest Degree High School	0.006	0.028 [0.059]	-0.025 [0.053]	-0.001	0.03 [0.072]	0.016
Highest Degree College	0.148	0.126	0.223	0.124	0.143	0.146
Highest Degree University	0.078 [0.101]	0.031	0.001	0.049	-0.023 [0.085]	-0.002 [0.093]
Highest Degree Any Post Secondary	0.226 [0.103]**	0.157 [0.102]	0.224 [0.108]**	0.174 [0.094]*	0.12 [0.092]	0.145
Belleves Grant Elligible	0.072 [0.095]	0.097	0.082 [0.104]	0.081	0.072	0.072 [0.092]
Unsure About Grant Elligibility	-0.134	-0.153 [0.102]	-0.213 [0.107]**	-0.065	-0.069 [0.092]	-0.12 [0.100]
Believes In Financial Aid Guarantee	0.04	0.017	0.017	0.103	0.134	0.051 [0.059]
Costs Too High For Some	-0.241 [0.105]**	-0.203 [0.102]**	-0.261 [0.101]**	-0.17 [0.097]*	-0.162 [0.092]*	-0.179 [0.098]*
Expected Returns to College	0.681	0.664 [0.340]*	0.78 [0.430]*	0.629	0.56 [0.277]**	0.665
Expected Returns to University	0.974 [0.461]**	1.022 [0.448]**	0.89 [0.455]*	0.838 [0.402]**	0.755 [0.368]**	0.747 [0.407]*
Lifetime PV Return > \$900K	0.014	-0.007	-0.016 [0.046]	0.048 [0.054]	0.027 [0.055]	0.027 [0.055]
Clicked on PDF	0.084 [0.071]	0.072 [0.068]	0.118 [0.070]*	0.12	0.083 [0.057]	0.151 [0.069]**
Requested More Information	0.038	0.009	0.043 [0.078]	0.106 [0.074]	0.062 [0.074]	0.085
Expected Grade This Year (percent)	-0.297 [1.722]	0.749	0.878 [1.807]	-0.593 [1.713]	-1.001 [2.207]	-0.545 [2.097]

Notes: Column 1 shows the treatment effect estimates as in Tables 6 through 9, with linear controls for female, born in Canada, grade last year (percent), indicators for whether mother and father's highest degrees were university, survey 1 reports on whether ever thought of dropping out of high school, whether government guarantees college access, and indicators for expected highest degree in survey 1 (unsure, high school, college, or university) for the sample excluding students expecting in survey 1 to go to university. Column 4 shows the samp but for the sample excluding students expecting in survey 1 to go to university. Column 2 and 3 display treatment effect estimates from regressing the outcomes on treatment status and reweighting the sample by the inverse probability of responding to the second survey. Probabilities were estimated using a probit model and the same variables used for controls in columns 3 and 6 show treatment effect estimates after interacting the control variables with the treatment indicator (see Puma et al. and text for more details). Huber-White robust standard errors are shown in square brackets. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent levels respectively.

Figure 1
Distribution of Minutes Spent on Video Page, Treated Participants



Notes: Figure shows histogram of time exposed to treatment (webpage with video, text, and financial aid calculator) before advancing to next screen. Histogram bars are displayed in minute intervals.

APPENDIX:

Survey 1

Treatment

Survey 2

Postcards to Access the Survey Site

Survey 1

- Please Enter your Email Address Here: *
 (to be used only to notify you when the second survey is ready and to send you your \$20)
- 2. Please Enter your Postal Code Here:*
- 3. What grade are you in?*
- 4. What is your gender?*
- 5. From which of the following ethnic groups do you consider yourself to be?*
- 6. Were you born in Canada?*
- 7. Were both of your parents born in Canada?*
- 8. What is the highest level of schooling that your mother completed?*
- 9. What is the highest level of schooling that your father completed?*
- 10. What was your grade average last year?*
- 11. Have you ever seriously considered leaving High School before graduation?*
- 12. What is the highest level of education you expect to get?*

The next question is based on the following statistic:

The average income for someone aged 35 in Toronto is \$38,200.

When you are 35 years old, what do you expect your annual income will be?*

- 14. Do you think that some students that qualify to attend an Ontario college or university cannot go because of a lack of financial support programs?*
- 15. 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)?*

Treatment

Please watch this 3 minute video and follow along using the text below. When you are finished and have tried out the financial aid calculator (below this video), click on the button below to finish the survey.

As a high school student you're probably thinking about your future. Whether you are in Grade 10, 11 or 12, you are probably thinking about your life after high school, what you might be doing next year or in three years or even five or ten years. What about college or university? You may already be planning to go. Or, you may be wondering whether it's really worth it, or whether you can afford it.

Why do I need higher education?

For some, getting a higher education or post-secondary education is not a priority. In fact, you might know someone who has 'made it' without a degree or diploma. However, it is getting harder and harder to make it in today's world without a higher education. Today, most employers require applicants have some form of post secondary education to even be considered for a job.

Benefits of higher education

There are numerous social and health benefits to higher education. However, the most significant benefit to a higher education is money! Most students who get some form of higher education will make significantly more money than those who do not participate or complete some higher education.

This table shows the average earnings of 35 year old Torontonians with different levels of schooling.

Level of Schooling	Average income
Less than high school	\$35,000
High school	\$37,000
2-year College diploma	\$49,000
4-year University degree	\$59,000

In fact, added up over a lifetime, a typical Canadian with a four-year undergraduate degree earns \$1,000,000 more than someone with a high school degree.

Different types of higher education: it's not a one size fits all

Keep in mind that higher education comes in different shapes and sizes. College is typically 2 years, university is typically 4 years, and both can be completed part time or full time.

OK, but isn't college and university expensive?

Average tuition and fees in Canada are about \$2,000 for colleges and \$4,000 for universities per year. In addition, you'll have to pay for other things like books and supplies, transportation,

room and board (if you live away from home and sometimes if you remain living with your parents or other family members). These expenses can add up to a lot of money.

	Living At Home	Living Away From Home
Tuition	\$4,372	\$4,372
Ancillary Fees	\$573	\$573
Room and Board	\$0	\$8,818
Transportation Costs	\$720	\$0
Total Costs	\$5,665	\$13,763

Many students and families may not realize how much is available to them. In fact, very few students actually pay the "sticker price" or the listed costs of going to a school.

Applying and obtaining financial assistance to go to college or university is like investing in yourself. It may cost some money now, but students that continue school after high school can expect to earn more money than a high school graduate.

Check out about how much the government will give you if you enroll in higher education:

Total Parental Income	Money Government will give you each year to go to university	Money government will lend you interest free to go to university
\$60,000 or less	\$7,965	\$5,836
\$80,000	\$5,946	\$3,817
\$100,000	\$4,056	\$2,779
\$120,000	\$2,129	\$851

The government gives out billions of dollars each year to deserving students. At the federal level, the Canada Student Loans Program offers a wide variety of grants (that do not have to be paid back) and loans (that do need to be paid back, but usually interest free).

The Ontario government guarantees that no student will be prevented from attending college or university because of the lack of money. Every student who is accepted into a full-time college or university program in Ontario will receive enough money to afford to study there.

To see how much money you might be eligible to receive, you can go to the OSAP site use the fun and simple on-line calculator.

Or, you can use a similar calculator provided in this survey. When you're finished this video, click the financial aid calculator link below.

A new window will pop up allowing you to get a good estimate of how much money in grants and loans you are eligible for if you decide to go to college or university.

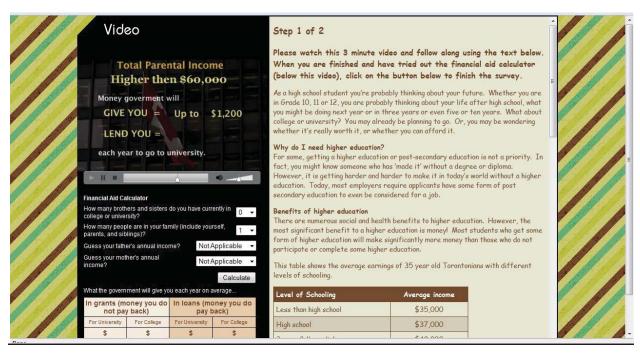
Going through the calculator takes only about five minutes. Even if you don't know all the information, guess so that you can get an estimate of your aid eligibility right now.

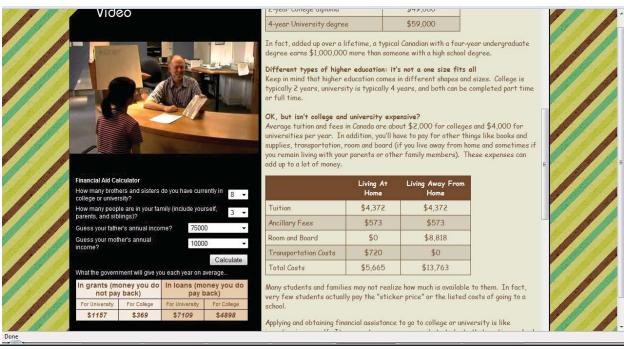
Then you're done.

You will receive a reminder email in the next couple of weeks telling you when the next part of the study will take place. During that time, you will be given a new link and asked to log in again to answer some follow up questions that will take less than 10 minutes. After answering those questions you will receive your \$20 award as a thank you for your full participation in this research.

Thank you again!

Treatment Screen Shots





Survey 2

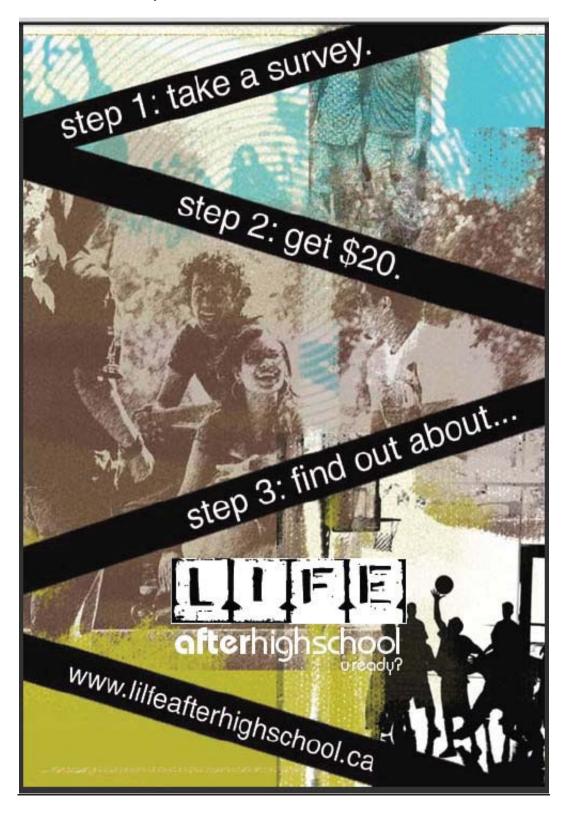
- 1. What do you think your grade average will be this year?*
- 2. Do you expect to stay in school after you finish high school?*
- 3. What is the highest level of education you expect to get?*
- 4. What do you think is the main reason why some people don't go to college or university?*
- 5. What kind of job do you see yourself having when you are 35 years old?

Questions 6-10 relate to the following statistic:

The average income for someone aged 35 in Canada is \$38,200.

- 6. 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?*
- 7. How much do you think you would earn if instead you were to complete a two-year college program?*
- 8. How much do you think you would earn if instead you were to complete a two-year college program?*
- 9. How much do you think you would you earn at age 35 if you completed a four-year Bachelor's degree in university?*
- 10. 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?*
- 11. Do you think that some students that qualify to attend an Ontario college or university cannot go because of a lack of financial support programs?*
- 12. Do you think that you would be eligible to receive government grants (money that you do not need to pay back) if you attend college or university full-time?*
- 13. If yes to the previous question, how much do you think you would be eligible to receive?
- 14. Do you think that you would be eligible to receive government loans (money that you do need to pay back but usually interest free) if you attend college or university full-time?*
- 15. If yes to the previous question, how much do you think you would be eligible to receive?

We have created a reference guide (in pdf format) for students interested in eventually applying to college or university. To download this document, click <u>here</u>



20 minutes for \$20

How much does it cost to go to college?

How much would the government pay if you went to university?

Is there life after high school?

We'll give you \$20 if you tell us what you think.

Complete 2 web surveys that will only take about 10 minutes each. Then choose between a \$20 chapters.ca gift certificate, \$20 in itunes, \$20 in cash (if you use online banking), a 1 in 50 chance of \$1,000, or a \$20 donation to your school.

The surveys are part of a study by researchers at the University of Toronto, sponsored by the Government of Canada.

We won't know your name, so all information you provide will be strictly confidential and used only for this study.

Questions? Contact your principal or email us at questions@lifeafterhighschool.ca

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