

# Do Perceptions of Costs and Benefits of Post-secondary Education Influence Participation?

James Côté  
*The University of Western Ontario*

Rod Skinkle  
*Academica Group Inc.*

Anne Motte  
*Canada Millennium Scholarship Foundation*

## ABSTRACT

Despite the continuing accumulation of knowledge of the factors influencing participation in post-secondary education, there are still gaps in our understanding. For example, very little is known regarding how perceptions of costs and benefits are implicated in an individual's decision to pursue college or university studies, and whether certain perceptions hamper access among students from disadvantaged backgrounds. This paper presents results from a research programme designed to develop and evaluate an operationalization of "perceived return on investment" (PRoI) in post-secondary education, based on students' subjective considerations of costs and benefits. These results are derived from two key research questions: is it possible to reliably measure high school students' perceived return on investment in a post-secondary education, and does the measurement of these perceptions predict actual post-secondary participation? Results show that PRoI can be measured satisfactorily and is predictive of university attendance, net of other factors currently known to influence participa-

tion. The “perceptual horizon effect” model is proposed to account for both positive and negative perceptions of returns on investment.

## RÉSUMÉ

Malgré l'accumulation des connaissances à propos des facteurs qui influencent la participation aux études postsecondaires, des lacunes demeurent dans notre compréhension du phénomène. Par exemple, nous en savons peu sur le mécanisme par lequel les perceptions des coûts et des bénéfices jouent un rôle dans la décision de poursuivre des études collégiales ou universitaires. De même, on ne sait pas dans quelle mesure certaines perceptions limitent l'accès aux études des jeunes provenant de milieux désavantagés. Cet article présente les résultats d'un programme de recherche ayant pour objectif de développer et d'évaluer l'opérationnalisation des rendements perçus en éducation postsecondaire en se basant sur l'évaluation subjective des coûts et des bénéfices par les étudiantes et étudiants. Le projet de recherche est issu de deux questions clés: est-il possible de mesurer de façon fiable les rendements de l'éducation postsecondaire tels que perçus par les élèves du secondaire et est-ce que cette mesure des perceptions peut prédire une éventuelle participation postsecondaire? Les résultats démontrent que les perceptions peuvent être mesurées de façon satisfaisante et peuvent prédire la participation aux études universitaires, et ce en contrôlant pour les autres facteurs connus comme ayant une influence sur la participation. Un modèle d'« horizon perceptuel » est proposé pour expliquer tant les perceptions positives que négatives du retour sur investissement.

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## INTRODUCTION

According to Statistics Canada, Canada is ahead of all other OECD countries in terms of higher educational participation rates (Statistics Canada, 2003). These figures represent part of a growth curve that saw university enrolments increase by 20% between 1998 and 2004, such that there are currently some one million university students in Canada (Statistics Canada, *The Daily*, October 11, 2005). This growth is in part a result of policy efforts by the Canadian government to increase accessibility to, and participation in, colleges and universities to meet labour market projections. However, these policy efforts have not created equal participation in higher education among all demographic groups (e.g., Finnie, Lascelles, & Sweetman, 2005; Junor & Usher, 2004; Looker & Lowe, 2001). For example, young Canadians with parents who attended university are up to four times more likely to attend university than are those with parents who did not complete high school (Finnie, Lascelles, & Sweetman, 2005). Accordingly, first-

generation students – those without parents who attended university – constitute an under-represented group that has not been fully reached by policy efforts. As education levels and income are correlated, this group includes a significant proportion of Canada's lower-income citizens.

A more recent concern has surfaced as a greater proportion of females than males have been enrolling in undergraduate programmes (e.g., Drolet, 2007; Frenette, & Zeman, 2007). This new gender difference in university participation has sparked worries that males will be left behind in the new economy, which places a premium on post-secondary credentials (Mathews, 2003). Economists explain this growing differential as resulting from a higher personal financial rate of return for females than males (e.g., Christofides, Hoy, & Yang, 2006). However, this explanation does not answer the question of why proportionately more males are not pursuing higher credentials, because there is also a significant disparity in financial rates of return between post-secondary and high school credentials for young men. Clearly, more research is needed to understand potential motivational and perceptual differences between males and females (Andres & Adamuti-Trache, 2007).

One way to approach the issue of why some young people forego a higher education is to investigate whether some young Canadians avoid higher education because their perceptions of personal costs outweigh, or block, the objective appraisal of potential benefits. Looker and Lowe (2001, p. 25) speak to this issue, with a conclusion that points directly to the need for research on the perceptions of costs and benefits:

There is growing Canadian evidence that the perceived cost of post-secondary education is a barrier for high school students from lower SES families. . . although several other researchers. . . argue that perceived costs do *not* act as a deterrent to post-secondary plans. *For Canada, a comparison of perceived and actual costs would be useful information for students for both policy makers and students making educational plans.* This raises the larger question about the role of perceptions in educational and career decision-making. Whether accurate or not, perceptions do influence decision-making. Thus, if a high school student, and her/his parents, believe that the cost of post-secondary education is beyond their means, or have incomplete information on the rates of return to specific post-secondary programs, this misinformation gets built into their decision-making. (emphases in original)

### The Importance of Monetary and Non-monetary Perceptions

The above literature raises the question of how accurate people are in their perceptions of the monetary costs and benefits of a post-secondary education. Junor and Usher (2004) and Usher (2005) report that most people overestimate the short-term costs of university education by a factor of five. However, those from lower-income families have the most serious misperceptions, to the point where on average they think the costs outweigh the benefits. Not only

do low-income Canadians think that tuition is costlier than it actually is, they grossly underestimate how much more university graduates make over high school graduates, so their cost-benefit analysis involves a double inaccuracy that reflects an unduly pessimistic view of the potential returns on a university education.

At the same time, at the lowest end of the economic spectrum, there are people who simply cannot afford a tertiary level education, so the accuracy of their perceptions may be irrelevant. According to Statistics Canada (2003), about 40% of Canadians report annual incomes less than \$20,000 years. Still, evidence of the influence of actual monetary costs on decisions to participate is mixed, with international comparisons showing different patterns (Swail & Heller, 2004; Canada Millennium Scholarship Foundation, 2004). Some Canadian research indicates that those from low-income backgrounds do not see financial barriers as more significant than do those from higher-income backgrounds. Indeed, the significant increase in university enrolment since 1998 includes the participation of low-income students (Corak & Zhao, 2003), in spite of a doubling of tuition costs in the past decade.

Perceptions of the *non-monetary* benefits and costs of tertiary studies among the student population is an almost uncharted territory. There is evidence that some young people from disadvantaged backgrounds may not be attending tertiary institutions more because of non-monetary barriers than monetary ones, especially as related to issues of identity and the tensions and conflicts associated with potential identity change and dislocation from familiar comfort zones (Foley, 2001). For example, Malatest & Associates (2004) found that "personal reasons" (p. 16) are more responsible than all other factors for dropping out from university among Aboriginal youth.

No research has touched the incentives that people might link with perceived non-monetary benefits, such as working conditions associated with higher credentials. Therefore, the lack of understanding of the role of non-monetary benefits may represent an important gap in our current understanding of post-secondary participation.

### Objective Estimates of Benefits

Although subjective perceptions of benefits are prone to bias and error, the objective monetary benefits of a higher education in Canada appear to be clearer. The evidence has been consistent for some time that level of education is highly related to income (Becker, 1964), with lifetime earnings advantages of holding university degrees over a high school diploma now estimated to average approximately one million dollars in Canada (Côté & Allahar, 2006; Junor & Usher, 2004; Usher, 2005). College and university graduates also benefit financially in terms of annual rates of return on their investments in their educations that outpace other forms of investments, like equities (HRDC, 2000; Junor & Usher, 2004). Estimates for financial rates of return from college and university educations compared to high school completion vary slightly in terms of

how they are calculated (Baum & Payea, 2004; Cohn & Addison, 1998; Institute for Higher Education Policy, 2005), but recent estimates for Canada put the rate of return at 15-28% in annual earnings for community college graduates and 12-20% for university graduates (Boothby & Rowe, 2002).

When we combine the research about the widespread inaccuracies in people's estimates of costs and benefits with the research about the significant rates of return, the question emerges as to why so many people are inaccurate in a pessimistic way, or as Junor and Usher (2004) write, have such faulty perceptions. A clue to this answer may lie in the findings reported above regarding the non-monetary costs found in the studies reported by Foley (2001) and Malatest & Associates (2004) regarding "personal reasons." However, their designation of personal reasons does have theoretical underpinnings. Because the existence of pessimistic inaccuracy is not as self-evident as an optimistic view of higher education, even if it is inaccurate, it is useful to consult a literature that helps us predict inaccuracies associated with pessimistic appraisals of the returns on higher education.

### Theoretical Considerations

While the objective estimates of monetary returns in post-secondary educational investments are calculable and appear to be robust (and costs are easily calculable; Junor & Usher, 2004), we do not yet have a standardized means of capturing subjective perceptions of these benefits and costs, or a theoretical basis for developing such a measure. Accordingly, the starting point in our research programme was to combine several theoretical perspectives that help us understand how young people approach their educational opportunities. The first step was to merge a social-psychological theory from the student development literature – the Integrated Paradigm of Student Development (Côté & Levine, 1997, 2000) – and sociological research related to the role of higher education in identity formation – the Identity Capital Model (Côté, 1997, 2002).

Both of these models were originally developed to explain how university students conceptualize their motivations for undertaking courses of action that are logical extensions of previous decisions to attend university. The former theory proposes that a goodness of fit between the person and learning environment predicts positive outcomes, while the latter theory adds the notion of individual differences in personal agency to account for how people influence this goodness of fit through their ability to actively participate in their own development.

However, the problem of measuring the perceived return on investment among high school students is somewhat different, because high school students face a major life transition for which they may or may not have made previous decisions. Accordingly, we integrated the notions of "horizon" from Junor and Usher (2004) and "horizons for action" from Hodkinson, Sparkes & Hodkinson (1996) with the above two models to develop the "perceptual horizon effect" model.

This new model predicts that prior experiences will *broaden* or *narrow* the future horizon that a person perceives for him/herself and that this perceived horizon is anchored in the subjective realm of identity. Those with broader horizons should have more positive assessments of investment returns in terms of the relationship between benefits and costs because they can anticipate their future involvement in these learning environments. They will also be most accurate in their cost-benefit analyses of the outcome experiences of various types of graduates, in terms of known cost and benefits, as discussed above. In contrast, those with narrower horizons will have less positive assessments because of a blockage in their ability to visualize their involvement in environments that are sensed as “foreign,” and their cost-benefit analyses will be inaccurate when compared with the available objective data (above).

Those with broader horizons should thus have more positive perceptions of the potential returns on investments of time, effort, and money devoted to a higher education such that the benefits outweigh the costs, and an important source of these perceptions would be parental influences: parents with more advanced education should promote broader horizons in their children as they grow up. Conversely, a source of a narrowing effect on horizons may come from parents with low levels of educational and occupational attainment. In addition to having less of a basis from role models for estimating cost and benefits for their own futures, those from these backgrounds may be particularly prone to an “identity anxiety” (a non-monetary “personal” cost of higher education) because they do not perceive a goodness of fit for themselves in current and future educational settings and they lack the level of personal agency necessary to rectify that problem themselves. Moreover, they might have deep-seated apprehensions that they will experience tensions with parents and peers and that they will have to change in ways that are unacceptable to these significant others.

### Research Questions

This research programme set out to answer two general research questions: (1) can perceptions of the costs and benefits of a post-secondary education be reliably and validly measured, and (2) do these perceptions predict future educational activities, net of other factors like gender and first-generation student status, and prior positive experiences with the educational system, knowledge of funding opportunities, and encouragement to pursue a postsecondary education? Two studies were undertaken to answer these questions. In the first study, the reliability and validity of a measure of perceived return on investment in a post-secondary education were assessed, as were the hypotheses regarding identity anxiety and its manifestation among males and first-generation students. In the second study, the predictive validity of this measure was assessed.

## STUDY 1

### Sample and Procedure

Study 1 used an online administration of an instrument package to a convenience sample of 704 college- and university-bound high school students who had completed the University Applicant Survey and College Applicant Survey for Acumen Research Group Inc. in 2005 and had indicated a willingness to participate in subsequent research. The median age of respondents was 18, and 68% were female. While this sample may be biased in terms of population representation, it does represent those who are most likely to attend a post-secondary institution. The robustness of the factor structure of the PROI-PSE (below) based on this sample is confirmed with its replication among grade 12 students (Study 2, below, not reported), many of whom did not intend to apply to a post-secondary institution, and in other studies carried out to assess the validity of the PROI-PSE, including a random telephone survey of the general population ( $n=1,025$ ) using a parallel version of the instrument (Acumen Research Group, 2008).

### Operationalizing PROI-PSE

We hypothesized that the relevant dimensions of the construct “perceived return on investment in a post-secondary education” (PROI-PSE) comprise senses of monetary and non-monetary returns on investments of time, effort, and money. Based on focus groups and a pilot test, an initial pool of 40 items was developed to measure perceptions of various types of costs and benefits associated with two forms of post-secondary education (community college and university) in relation to a high school education. Through a series of steps, including factor analysis (Principal Components with Varimax Rotation, number of factors specified at four), a core scale of 16 items was identified (the PROI16), with four subscales, each made up of four items. These items, their scale names, and factor loadings, are listed in Table 1. The total score for the PROI16 is calculated by subtracting the sum of the two costs subscales from the sum of the two benefits subscales.

Table 2 shows the correlations among the PROI subscales for study 1 (and study 2). This table shows positive correlations within each set of cost and benefit subscales, and negative correlations between them. The perceptual horizon effect model would warrant the interpretation that these correlations suggest that a perception of greater costs may lead people to reduce their appraisals of benefits.

Three ancillary measures were used to assess the concurrent validity of the PROI16, and its subscales. First, a global measure of benefit versus costs was developed to see how people with different categorical positions on “costs versus benefits” differ in terms of their endorsement of the PROI subscales. Respondents were asked to select one of the following five categories separately for university and community college: (1) the costs extremely outweigh the

**Table 1. Items and factor structure of the PРо116: Factor loadings greater than .40**

	Non-monetary benefits	Identity anxiety	Debt aversion	Monetary benefits
Eigenvalue	3.2	2.8	2.3	2.0
% variance explained	20	17	14	13
Cronbach's alpha	.79	.84	.75	.81
I am confident that a PSE would lead me to a better paying job.	.596			.535
Although a PSE can be costly, I believe that I would make more money in the long-run.				.635
I think that if I were to put the time and effort into getting a good PSE, I would make a lot more money in the long run.				.702
People who get a PSE will make more money over their life-time than those who just get a high school education.				.535
People who have a PSE get jobs that are much more satisfying.	.775			
The best way to get a prestigious job is through a PSE.	.749			
If you want a rewarding career these days, you need a PSE.	.827			
Getting a PSE will lead me to find work that I really enjoy doing.	.596			
I'm hesitant to pursue a PSE because it would create tensions between my parents and me.		.825		
I'm hesitant to pursue a PSE because it would create tensions with the people I grew up with.		.818		
If I pursued a PSE, I'm afraid that it would confuse me about "who I am."		.808		
If I were to pursue a PSE, my friends would think that I'm trying to be better than them.		.716		
The costs of a PSE have become so high that they outweigh any future financial benefits.			.740	
I'm hesitant to undertake a post-secondary because of the amount of debt I'm likely to accumulate by the time I graduate.			.804	
I'm not sure that a PSE would pay off even in the long-run, given how costly it is these days.			.736	
Given the high costs of a PSE and the time it takes to complete it, you are really no further ahead financially than if you get a job right after high school.			.533	



**Table 2. Correlations among PROI subscales for study 1 (S1) and study 2 (S2 – Time 1 and Time 2) samples**

	Monetary benefits		Non-monetary benefits			Identity anxiety	
	S1	S2	S1	S2	S1	S2	
		T1	T2	T1	T2	T1	T2
Non-monetary benefits	.66	.60	.64				
Identity anxiety	-.40	-.15	-.15	-.26	-.01	-.10	
Debt aversion	-.56	-.26	-.23	-.40	-.06	-.19	.52 .45 .43

S1 *ns* = 524-550; S2 T1 *ns* = 953-972; S2 T2 *ns* = 475-482; Correlations greater than, or equal to, .09 or are significant at the .05 level, 2-tailed

benefits, (2) the costs somewhat outweigh the benefits, (3) the benefits neutralize the costs, (4) the benefits somewhat outweigh the costs, and (5) the benefits extremely outweigh the costs. The percentages of responses for these categories for university were respectively, 19, 12, 7, 12, and 45. A series of oneway ANOVAs (with SNK post-hoc tests) revealed multiple significant differences compatible with the PROI16 subscales. Most consistently, those selecting category 1 for university or college gave significantly lower ratings on the monetary benefits subscale of the PROI16, and higher ratings on monetary costs for both. The same pattern was revealed with respect to the non-monetary scales: those in category 1 gave lower ratings of the non-monetary benefits and higher ratings of non-monetary costs.

Second, in order to explore possible sources of errors in estimations of costs and benefits, the sample was divided into three approximately equal groups based on a question asking them to estimate the tuition costs for one year of university (respondents could choose among eleven categories in \$1000 increments from “0-\$1000” to “\$10,000+”). The three groups were: (1) those who estimated that university tuition was less than \$5,000, (2) those who thought it was between \$5,000 and \$7,999, and (3) those who thought it was \$8,000 or more. Oneway ANOVAs (with SNK post-hoc tests) indicated that this grouping significantly differentiates PROI16 ratings on the monetary benefits and monetary costs subscales, with those who were *least* accurate (tuition more than \$8,000) estimating the total benefits to be lower and the total costs to be higher (respectively,  $F = 8.7, p < .000$  and  $F = 4.0, p < .019$ ).

In comparing these two ancillary measures, a cross-tabulation of the three categories of tuition estimate with the five categories of cost-benefit analysis, showed that those who were most accurate (tuition < \$5K) were significantly more likely to see post-secondary educational benefits as extremely outweighing the costs and less likely to think that the costs somewhat outweigh the benefits. The opposite was true for those who grossly over-estimate the cost of tuition (tuition > \$8K). These findings support the prediction from the perceptual horizon effect model that those who are more accurate in their cost-benefit

analyses will also be most positive in their outlook, and vice versa, that those who are least accurate will also be most pessimistic.

Third, the correlations among the PROI subscales and two “value-added” measures of post-secondary credentials were calculated (these measures are available from the authors upon request). The “value added” measures assess respondents’ estimates of the difference in returns between post-secondary and high school credentials (university or college minus high school). The first value-added measure assesses perceptions of monetary benefits in dollar figures, while the second assesses perceptions of non-monetary benefits along a Likert scale.

The monetary value-added measure was based on Preston (2004), which used an income projection item asking (British) respondents how much they thought people would expect to make in Pound Sterling figures over their working life (in 5-year increments). We asked our respondents for estimates in Canadian dollars for people beginning full-time employment in each of the following three scenarios: (a) finishing high school but not going on to further studies, (b) completing Community College, (c) and finishing a BA/BSc. These scales provide estimates of the relative value of each level of education, as well as “difference scores” based on subtracting the estimated incomes for a high school education from (a) a community college diploma, and (b) a university degree. Thus, these difference scores can be treated as value-added income estimates of both forms of higher education.

The non-monetary value-added measure provided respondents with a 17-item scale that depicts potential job-related and personal-life benefits (e.g., job satisfaction, personal growth). Respondents were asked to first rate the extent of benefit they think people in general derive from a high school diploma on these 17 items. They were then asked to rate the benefits of a community-college diploma on these items, and finally to rate benefits people derive from an undergraduate degree. The Cronbach alphas for these three ratings were .94, .95, and .94, respectively. However, the scale totals were not of primary interest. Rather, the difference between scale-totals was key in determining the extent to which different levels of post-secondary education are value-added beyond a high school education. Thus, like the monetary calculations, these scales provide estimates of the relative value of each level of education, as well as “difference scores” based on subtracting the estimated benefits of a high school education from (a) a community college diploma, and (b) a university degree. These latter scores can be treated as non-monetary value-added estimates of both forms of higher education. Table 3 shows these results.

The correlation matrix in Table 3 confirms that perceived costs and benefits as measured by the Likert-format PROI16 are associated in predictable ways with objective estimations of income benefits using an entirely different method of measurement. It can be seen that those who score higher on the PROI16 benefits subscales also tend to rate the benefits of both forms of advanced education higher than the benefits of high school as measured by the value-added difference score. It is important to note that, although not in this table, the correlations for

**Table 3. Correlations between PRO16 subscales and value-added measures of RoI**

PRO16 Subscales	Value-added difference scores			
	Income projections		Sense of non-monetary benefits	
	University over high school	College over high school	University over high school	College over high school
Monetary benefits	.16	.12	.30	.29
Non-monetary benefits	.17	.10	.39	.34
Debt aversion	-.10	-.09	-.18	-.22
Identity anxiety	-.04	-.11	-.01	-.07

Correlations greater than, or equal to, .09 or are significant at the .05 level, 2-tailed; *ns* = 471-481

each of the educational income and non-monetary benefits items *are not significant on their own*; rather correlations are significant only for the value-added scores, which are obtained when projected high school earnings are subtracted from the respective projected earnings of college and university graduates. In addition, in support of the perceptual horizon effect model, the identity anxiety scale is not systematically related to the value-added difference scores, and has significantly lower correlations than all the benefits scales (the magnitude of the differences between the identity anxiety and benefits correlations range from .20 to .41, when taking into account the sign of the correlations). This suggests that those with higher levels of identity anxiety are not making the same sorts of cost-benefit calculations as those with lower levels of identity anxiety.

Finally, t-tests were conducted to provide information on how the PRO16 subscales differed by gender and first-generation student status. The results reveal that males were significantly less sure about the non-monetary benefits than were females, and had higher levels of identity anxiety, while first-generation students had significantly higher levels of identity anxiety than those with parents who had some post-secondary experience.

## STUDY 2

Study 2 addresses the second research question by following a group of grade-12 students, first surveyed in the winter of 2006, into the next academic year (fall 2006) to determine who: (1) entered the work force, (2) stayed in high school, (3) enrolled in a community college, or (4) enrolled in a university.

### Method

#### *Sample and procedure*

A sample of 999 grade-12 students in London, Ontario, completed a short survey during telephone interviews conducted in February/March of 2006

(sample S2 T1). In October/November of 2006 (T2), 711 of the S2 T1 sample were successfully located by telephone (72.7% of the original sample – sample S2 T2). Direct telephone contact was made with 496 respondents (49.7% of the original sample), who specified their current education/work status. Information on the current activity status of those who could not be directly contacted was obtained through their parents or family members during the telephone contact attempt.

An analysis of sample characteristics revealed that attrition did not present problems in analyzing the follow-up data because sample S2 T2 very closely replicated the sample S2 T1 in terms of the gender distribution, parental education, and percentage of first-generation students.

### *Measures*

*The PRO16.* The PRO16 developed in study 1 was administered in study 2 at T1. The alpha coefficients for the four subscales ranged from .65 to .75.

*Ancillary variables.* Two background factors were measured at T1: gender (male = 0; female = 1) and first-generation status. The latter variable was coded in two ways, for analysis of different outcomes. When the dependent variable was university attendance, respondents with at least one parent having some university were coded as “0,” while those with neither parent having some university experience were coded as “1.” When the dependent variable was college or university attendance, where at least one parent had some college or university, respondents were coded as “0,” and where neither parent had some college or university experience, the coding was “1.”

In addition, four educational experiences were measured at T1: grade attainment (C or less = 0; B = 1; A/A+ = 2), academic engagement (hours spent out of class studying and doing assignments during a typical week: 5 hours or fewer = 0; 6 to 10 hours = 1; 11 or more hours = 2), encouragement to pursue a post-secondary studies (range = 8–28, based on seven questions concerning support from parents, friends, and teachers, alpha = .62), and knowledge of sources of funding (range = 0–28, based on seven questions enquiring about the extent of knowledge of commonly available scholarships and awards, alpha = .82). These scales are available from the authors upon request.

*Post-secondary outcomes (T2outcome).* Slightly less than one half of the follow-up sample was in college or university in the fall of 2006, while a surprising one third remained in high school. Their reasons for remaining in high school were not queried, but anecdotal evidence suggests that the two main reasons for staying in high school were (a) to improve their GPA, or (b) to put off their decision about what to do next. (In 2003, the Ontario Ministry of Education eliminated the fifth year of high school, grade 13. Since that time, large numbers of students have been repeating or taking additional grade 12 courses.) About 3% were working while remaining in high school and another 3% were in “other” activities. For the “T2outcome” variable, these last two categories were recoded so that all of those in high school (including those who were also

working while attending) were included together as “high school” and those in the workforce or “other” were included together as “work/other.” The resulting distribution of the variable T2outcome was: 17% “work/other,” 36% “high school,” 17% “community college,” and 30% “university.”

## Results

Several bivariate analyses of these ancillary variables suggested that males and first-generation students had similar concerns about the costs of a post-secondary education, as well as similar experiences with the educational system. In a general replication of study 1, t-tests revealed that males differed from females on all PROI16 subscales except debt aversion. As in study 1, first-generation students had higher levels of identity anxiety. In terms of education-experience variables, both males and first-generation students reported lower grades, less encouragement to pursue further studies, and less knowledge of funding opportunities. In addition, males reported less academic engagement than did females. At the same time, for the overall sample, both identity anxiety and debt aversion were significantly negatively correlated with GPA, academic engagement, encouragement, and knowledge of funding sources, supporting the perceptual horizon effect model in terms of the distorting effect on perceptions and behaviour of a narrow horizon.

Respondents’ choices with respect to the first step in their post-secondary education-to-work transition – T2outcome – were analyzed using logistic regression analysis. To do so, T2outcome was recoded into a dichotomous variable in two ways representing post-secondary choices, as described above. For the first analysis, university attendees were categorized in relation to the other three groups, while for the second analysis, both college and university attendees were categorized against those who went to work or remained in high school. Thus, two sets of models were analyzed: one in which university attendance was the dependent variable (university attendance = 1; the other three categories = 0), and the other in which overall post-secondary attendance was of the dependent variable (college and university attendance = 1; work/other and high school = 0).

Table 4 shows the results of the logistic regression undertaken with university attendance as the dependent variable and the PROI16 as the final independent variable. The two background variables (gender and first-generation student status) were entered first as a block, followed by the four educational-experiences variables, also entered as a block (grade attainment, academic engagement, encouragement from significant others, and knowledge of funding sources). The omnibus tests of model coefficients revealed significance for step, block and model, and the independent variables correctly classified 74% of cases in the dependent variable.

**Table 4. Logistic regression results for T1 independent variables predicting T2 university attendance versus other outcomes**

T1 variables	B	S.E.	Wald	df	Sig.	Odds ratio
Gender	.44	.23	3.56	1	.059	1.545
First-generation student	-.66	.21	9.55	1	.002	.517
Grade average	.84	.18	22.78	1	.000	2.325
Academic engagement	.21	.13	2.55	1	.110	1.231
Encouragement from significant others	.12	.04	8.24	1	.004	1.125
Knowledge of funding sources	.04	.02	9.12	1	.003	1.069
Perceived Return on Investments in a PSE (PROI16)	.04	.02	6.69	1	.010	1.042
Constant	-6.5	.99	42.632	1	.000	.002

In interpreting the results, it is noteworthy that academic engagement in courses was *not* significant. The fact that the amount of time respondents spent studying and doing assignments does not uniquely predict university attendance (when grades and other factors are taken into account) corresponds with recent evidence of reduced engagement among both secondary and university students in conjunction with grade inflation, rendering the obtained grade very important in determining academic trajectories (e.g., Côté & Allahar, 2007; National Survey Student Engagement, 2004).

All other independent variables remained significant unique predictors. Females were over 50% more likely to attend university than were males (odds ratio = 1.545), and first-generation university students were about half as likely to attend (.517) than were those who had a parent who attended university. Grades were very important, with the odds of attending university increasing by 233% in the difference between a C average or less and a B, and again in the difference between a B average and an A. Receiving encouragement from significant others remained a unique predictor, with the odds of attending increasing by 13% with every point on this scale. In addition, knowledge of funding opportunities increased the likelihood of attending by 7% for each point on this scale. Finally, the PROI16 remained a significant predictor when controlling for all of these other factors, with the odds of attending increasing by 4% (odds ratio = 1.042) with every point on this scale. Taken together, this set of relationships is compatible with findings recently reported by Frenette and Zeman (2007) in their analysis of Youth in Transition Survey (YITS) data, where they find that grades, parental expectations, and the gender-based earnings premium difference between university and high school credentials are among the important predictors of university attendance differences between males and females.

Although not shown in a table, when the two main components of the PROI16 (total benefits and total costs) were substituted for the PROI16 in the analysis, only total costs remained significant and the odds ratio indicated that someone was about 7% less likely to attend university with every point on that scale. When only identity anxiety was entered into the analysis, this scale was significant with an odds ratio of .867, indicating that the likelihood of attending

decreased by about 13% with every point on that scale. Interestingly, gender lost its significance with identity anxiety in the model, presumably because identity anxiety is more of a “male problem,” as revealed by the bivariate analyses.

When the logistic regression analysis was repeated with “any post-secondary attendance” as the dependent variable (i.e., combining college and university students into one group versus those who remained in high school or were working/other in another group), the PRO16 was not a significant predictor of attendance (no table is used to present these findings because of the similar structure of results presented in Table 4). The reason for the lack of significant prediction of the PRO16 lies in an examination of bivariate comparisons of T2outcome with the independent variables, which revealed that those who attended community college had more in common with those who stayed in high school than they did with those who went to university. These bivariate results (oneway ANOVAs with SNK post-hoc tests) revealed that those who went to community college had equivalent ratings with university students on the PRO16 subscales only for (high) non-monetary benefits. Moreover, they differed from university students on all the educational experience variables, with lower grades, academic engagement, encouragement, and knowledge of funding sources.

These results suggest that many students see (Ontario) community colleges as something of an extension of high school. However, it remains to be seen if such findings would hold in other provinces, or in the US, where community colleges are more sequentially connected with universities in the sense that two years of college would count toward a university degree and therefore presumably have different standards (e.g., the Associates Degree in the US). Similarly, college credentials vary significantly, ranging from 1-year certificates through 3-year diplomas, and some provide applied degrees. Thus, we speculate that this programme variability may influence, correctly, the perceived costs and benefits of the two forms of post-secondary education.

Still, the overall model was significant for “any post-secondary attendance”: females were about 67% more likely to attend than males, and grades remained important (but with about one half the impact as university-only attendance). The significance level of first-generation status drops to .09, but the odds ratio is .68, suggesting that first-generations students still shy away from any higher educational involvement, but the effect is not as strong as in the case of university attendance only. In addition, it remained important for significant others to encourage students (19% increase in odds with every point on this scale). However, knowledge of funding opportunities did not significantly predict the dependent variable.

## DISCUSSION

Both research questions were answered in the affirmative: (1) perceptions of the costs and benefits of a post-secondary education can be reliably and validly measured by the PRO16 (study 1), and (2) these perceptions predict



future educational activities, net of other factors like gender and first-generation student status, prior experiences with the educational system, knowledge of funding opportunities, and encouragement to pursue a post-secondary education (study 2). However, it appears that it is the two subscales tapping costs (debt aversion and identity anxiety) that are primarily responsible for the predictive validity of the PRoI16.

In addition to providing evidence for the reliability and validity of the PRoI16, analyses undertaken in study 1 highlight the importance of examining sources of the over-estimation of costs of post-secondary credentials and an under-estimation of the benefits. While there is evidence that a proportion of the students do engage in some form of cost-benefit analysis when it comes to making plans, and that those who do so are more accurate in their assessments, others appear to misjudge the cost-benefit ratio in a pessimistic fashion.

Several results shed light on the variation in accuracy of students' cost-benefits analyses in support of the proposed "perceptual horizon effect" model. First, perceptions of costs were negatively correlated with benefits, although there is no obvious reason why they should be from an objective appraisal of each (i.e., tuition costs are unrelated to monetary rates of return for undergraduate degrees). Second, those who were most accurate in their estimates of tuition levels had the most positive cost-benefit analysis (i.e., higher PRoI16 scores). And third, identity anxiety was not correlated with the value added differences (the difference between returns on post-secondary credentials over high-school credentials), suggesting that those with higher levels of identity anxiety are not only less accurate, but also less cognitively complex in making cost-benefit appraisals.

Both males and first-generation students show higher levels of identity anxiety. In the case of first-generation students, the results support the central tenet of the perceptual horizon effect model that those from backgrounds where a university education is not role modelled as they grow up (e.g., in terms of parental influence and encouragement) have more restricted perceptions of future educational and occupational horizons. In the case of gender differences, males appear to have narrower horizons than females. The reason for this is unclear from the data collected here, but the narrower horizon may be a result of their lower levels of academic achievement and engagement (cf. Frenette & Zeman, 2007).

More generally, the results suggest that for some students, a restricted horizon may be related to an identity anxiety that creates inflated estimates of financial costs and lower estimates of benefits that are not counteracted by a seeking out of knowledge, such as funding opportunities. For others, a restricted horizon may be due to a lack of encouragement to think in terms of a university education in their future, perhaps because of lower grades and academic engagement. However, for some students from disadvantaged backgrounds, we would speculate that these poorer grades and lower levels of academic engagement may be partly due to a lack of prior encouragement stemming from a la-



bellings of the student. This could be the case for some first-generation students who might be expected by teachers to follow in the footsteps of their parents, or for some males who have lower expectations placed on them by merit of their lack of interest in formal education. This paradox may be the converse of the “Pygmalion effect” hypothesized some time ago (Rosenthal & Jacobson, 1968), and deserves further investigation as a source of the continuing inequitable access to Canadian universities.

One unexpected result of particular note was the finding that those who attended community college had more in common with those who stayed in high school than with those who went to university in terms of perceptions of costs and benefits, as well as key forms of educational experiences associated with higher levels of academic achievement. We interpret these findings to mean that students drawn to the Ontario community college system view college more as an extension of high school and that university-bound students perceive sharper (and greater) distinctions between the costs/benefits of university compared to high school alone. These differing perceptions concerning college versus university warrant further research, particularly in terms of the measurement of perceived return on investment. With more people adopting varied career pathways, including growing numbers who attain a college designation following a university undergraduate degree (e.g., Clark, 1999; Junor & Usher, 2004), it is important to understand potential differences (and confounds) between perceptions associated with these two destinations.

With respect to the future use of this new instrument, because the PRO16 predicts whether a high school student will enrol in a university, it holds promise as an evaluation research tool in assessing the impact of programmes and services aimed at promoting greater participation among under-represented groups. For example, it may be of use in intervention efforts designed to address inequities in access by allowing an examination of whether factors like changes in levels of accurate knowledge of actual tuition levels, salaries of post-secondary graduates, and student loans and scholarships influence perceived return on investments in a higher education. These intervention efforts could use the PRO16 instrument to assess the extent to which training in realistic and informed planning can pay off in terms of greater long-term returns on investment on a person-by-person basis. Optimally, longitudinal research would be undertaken tracking students from high school into the labour market to more precisely document the relationship between conscious planning and eventual long-term, later-life benefits. ♦

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#### ACKNOWLEDGEMENT

This research was funded by the Canada Millennium Scholarship Foundation and carried out by Academica Group Inc. (formerly Acumen Research Group, Inc.).

#### CONTACT INFORMATION

James Côté  
Department of Sociology  
University of Western Ontario  
London, Ontario, Canada  
N6A 5C2  
cote@uwo.ca  
Tel: 519-661-2111 x85118  
Fax: 519-661-3200

James Côté is a Professor of Sociology at The University of Western Ontario. He has authored or co-authored a variety of journal articles on student experiences with higher education (e.g., “*Attitude versus aptitude: Is intelligence or motivation more important for positive higher educational outcomes?*”), as well as a recent policy-oriented book (*Ivory Tower Blues*, University of Toronto Press, 2007). Research interests overlapping with higher education include the sociology of youth (*Critical Youth Studies*, Pearson Education, 2006), and the social psychology of identity (*Identity Formation, Agency, and Culture*, Lawrence Erlbaum, 2002).

Rod Skinkle is the founder and president of Academica Group Inc., which works internationally to deliver a wide range of post-secondary educational policy and marketing studies. He teaches Applied Research at the university and college level and is the principal author of the University/College Applicant Survey, Canada’s first and longest running syndicated study dedicated to post-secondary marketing and policy research. Rod holds a Masters Degree in Applied Research and has presented and published research for numerous government and policy groups in business and scholarly journals.

Anne Motte is a policy and research officer at the Canada Millennium Scholarship Foundation. Among other research projects, she is responsible for the Millennium access bursary evaluation (the “MESA project”), Canada’s largest evaluation of an on-going student financial aid program. She also co-authored the latest edition of *The Price of Knowledge*. Anne is a graduate of economics from McGill and Université du Québec à Montréal with interests in education and labour market policy issues.