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Reasons for Non-Completion of Postsecondary Education and Profile of Postsecondary Dropouts

REPORT

by:
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for:
Learning Policy Directorate
Strategic Policy and Research

May 2008



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Abstract

Using the longitudinal data of the 18 to 20 year-old cohort from the Youth in Transition Survey (YITS), the present analysis examined youths who attended postsecondary education during the three cycles (2000, 2002, and 2004). Following the theoretical framework of Tinto (1993), postsecondary dropouts were identified and profiled based on pre-postsecondary condition and postsecondary integration and membership. Results of survey analysis indicated that Canadian postsecondary dropouts tended to (a) be male (b) have a low postsecondary educational goal, (c) have an experience of dropping out of high school, (d) have an experience of drug abuse in high school, (e) have the first year postsecondary Grade Point Average (GPA) below 60%, (f) fair poorly in social networking, (g) show no interest in volunteering work on campus, (h) have nobody on campus to talk about their personal issues, (i) contemplate (at least monthly) dropping out, (j) have low sense of belonging, (k) rely on social assistance, (l) have no government scholarship or parent loans, and (m) marry during the postsecondary years.

Potentially persistence could improve if (a) secondary education systems train students to have an adequate potential for university studies (i.e., the importance of higher standards), (b) trade schools and colleges make their programs more “friendly” to students and provide remediation to prepare students for their programs (c) if there are support groups on campus for students at postsecondary education institutions, (d) postsecondary education institutions make every effort to ensure that youths succeed in academic coursework (i.e., the importance of academic success), (e) postsecondary education institutions offer extracurricular activities so designed that participation can help youths deal with the academic challenge and demand of their programs while building relationships (i.e., the importance of sense of belonging), and (f) postsecondary education institutions establish multiple forms of scholarship to boost the morale of youths for persistence in postsecondary education (i.e., the importance of reward for persistence).

1. Introduction

Since the looming of a global economy, all developed countries have been striving to maintain domestic prosperity and promote international competitiveness. To succeed in global competition, it is well recognized that countries must have a well-educated population and a highly-qualified workforce. Postsecondary education has naturally become vital to the future growth of developed countries. For example, the European Union endorsed a common set of objectives for education and training in 2002 to address the increasing demand of the knowledge-based global economy. The strategic endorsement calls for a radical progress of strengthening postsecondary education in Europe and sets the goal of 2010 to upgrade the European education systems to “a world quality reference.”

Canada is also in a process of setting and implementing coherent and consistent goals and benchmarks for Canadian education systems. In 2006, provincial and territorial governments convened a summit to discuss cooperative strategies to improve postsecondary education in Canada. According to the Association of Universities and Colleges of Canada, the Canadian government makes a major investment in postsecondary education every year (\$28 billion in 2005) and full-time enrollment has been increasing by 23% from 2001 to 2005 (from 650,000 to 800,000). The Conference Board of Canada estimates that enrollment in community colleges could reach 531,000 by 2009. Overall, the proportion of Canadian youth participating in postsecondary education has increased from 62% in 1999 to 70% in 2001 to 76% in 2003 (Shaienks, Eisl-Culkin, & Bussière, 2006).

Although these are all positive news, one of the potential concerns coming with such significantly increased enrollment is that the dropout rate often rises. It is strategic for Canada to investigate the issue of dropping out of postsecondary education at this historical moment to prepare policymakers and administrators for prevention and intervention purposes. Note that postsecondary education includes programs at universities, colleges, and technical (trade) schools in Canada.

Recent Canadian national surveys, such as the Youth in Transition Survey (YITS), have provided a good opportunity to examine the issue of dropping out of postsecondary education in Canada. Given that longitudinal data that allow such research at the national level became available only recently, the present analysis may well be the first piece of empirical research that identifies and profiles postsecondary education dropouts in Canada. By addressing the characteristics of youths who drop out of postsecondary education, the present analysis aimed to provide empirical evidence leading to preventive and interventional strategies to keep the Canadian postsecondary education dropout rate competitive internationally.

Postsecondary education status is a complex concept. We adopted the definitions used by Statistics Canada to describe the issue of dropping out of postsecondary education. In Shaienks et al. (2006, p. 13), a postsecondary education graduate is someone who has already graduated from a postsecondary institution and includes both graduate continuers and graduate non-continuers. A postsecondary education graduate continuer is someone who has already graduated from a postsecondary institution and is still pursuing education at a postsecondary institution, whereas a postsecondary education graduate non-continuer is someone who has already graduated from a postsecondary institution and is not pursuing education in a postsecondary institution.

Two groups of youth form what is referred to as postsecondary education non-graduates: continuers and dropouts. In Shaienks et al. (2006, p. 13), a postsecondary education continuer is someone who is attending a postsecondary education institution but has not yet graduated. A postsecondary education dropout is someone who has attended postsecondary education but is no longer pursuing it and has never graduated from a postsecondary education institution. Our focus is postsecondary education dropouts in the present analysis.

It is possible for youth to drop out of postsecondary education temporarily, meaning that they come back after a period of absence. YITS measures postsecondary education status at the end of each cycle, with three cycles of data collection. At the end of the last cycle, if youth have graduated during the first and last cycles, they are graduates. If youth are still in a postsecondary education program, they are continuers whether or not they have stopped during the first and last cycles. If youth are not in any postsecondary education program, they are dropouts whether or not they have come back during the first and last cycles. This treatment is conceptually sound in handling “stop-outs” or “come-backs” in that as much as it can argued that this group of youth may come back again, the same argument can be made for all dropouts that they may come back.

2. Critical Review of Literature

The main function of the literature review in the present analysis is to provide a theoretical framework that guides the selection of variables as predictors of dropping out of postsecondary education. To set the stage for the present analysis, a brief review of the issue of dropping out of postsecondary education in Canada is appropriate, followed by a detailed review of major influential theories on reasons why youth do drop out of postsecondary education.

Current Status of Dropping out of Postsecondary Education in Canada

According to the *Daily* (Statistics Canada, June 16, 2004), although most Canadian youths went on to further studies after high school, not all stayed until postsecondary graduation, as indicated in the Youth in Transition Survey (YITS) data. Specifically, in December 2001, by the age of 22, about 11% of Canadian youths had left postsecondary education without graduating, and about one-third completed at least one postsecondary credential (13% were continuing their postsecondary education after having already graduated). Adding to the complexity of the issue is the fact that dropping out of postsecondary education does not necessarily mean a halt to higher education altogether. About 35% of those who had left postsecondary education in an earlier survey when they were 20 did return by the time they were 22.

Following the same national sample of Canadian youth for two more years, Shaienks et al. (2006) reported that:

The postsecondary dropout rate in December 2003 was 12% for Canada overall, higher than the high school dropout rate recorded. Given the age of the respondents, this rate is likely to change again in the years to come. The vast majority of provinces had a dropout rate somewhere between 10% and 12%, with Prince Edward Island posting the lowest rate, at 9%, and Nova Scotia the highest, at 16%. As with the high school dropouts, the postsecondary dropouts returned to this type of institution. Nearly half of youth who had left a postsecondary institution as of December 1999 returned within the next four-year period. One in four had eventually graduated as of December 2003. (p. 15).

Shaienks et al. (2006) also provided a detailed decomposition of the Canadian youth who, in December 2003, were 22 years old and not in high school. About 76% attended postsecondary education, whereas about 24% did not. Among those attending postsecondary education, about 12% graduated, about 21% were continuers, and about 12% were dropouts. Finally, although nearly half of postsecondary education dropouts returned, Shaienks et al. (2006) emphasized that it is more difficult for youth to come back as they get older and have children.

Tinto's (1993) Theory of Postsecondary Education Student Attrition

In 1993, Vincent Tinto published his landmark book on postsecondary education student attrition entitled *Leaving College: Rethinking the Causes and Cures of Student Attrition* (2nd ed.). The first edition of the book was published in 1987. His original theory on postsecondary education student attrition was subjected to vigorous criticism and testing for five years. In the second edition, Tinto substantially improved his original theory by incorporating many philosophical critiques and injecting much empirical evidence into his conceptual framework. Citing Braxton, Milem, and Sullivan (2000, p. 107), Guiffrida (2006, p. 451) stated that “Tinto’s (1993) theory of student departure is the most widely cited theory for explaining the student departure process and has reached ‘near paradigmic status’ in the field of higher education.” In the present analysis, we adopted Tinto’s (1993) theory as our theoretical framework to guide a longitudinal multivariate analysis designed to profile postsecondary education dropouts and discern reasons for postsecondary education student attribution in Canada.

As an overview, Tinto’s (1993) theory is essentially a multivariate model of student retention in postsecondary institutions to explain student departure from postsecondary education prior to graduation. He posits that individual pre-postsecondary education attributes (family background, individual skill and ability, and secondary schooling quality) form individual goals and commitments for postsecondary education. Once the individual enters postsecondary education, those individual goals and commitments interact constantly with institutional attributes (i.e., characteristics of the formal and informal academic and social environments). The extent to which the individual is able to academically and socially integrate into the formal and informal academic and social environments of the institution determines whether the individual persists through postsecondary education or drops out of postsecondary education. In general, integration and affiliation are the two key concepts that form the conceptual basis of Tinto’s (1993) model. In a book published in the same year entitled *What Matters in College? Four Critical Years Revisited*, Astin (1993) also emphasized those concepts for they are central to students’ development and progress in postsecondary education.

Tinto (1993) sees integration as a process in which the individual actively engages and involves in activities within the postsecondary education community. He distinguishes between social integration and academic integration. Social integration occurs when the individual develops strong and effective social ties primarily as a result of daily interactions with other members of the community. Academic integration results from sharing common information, perspectives, and values with other members of the community. Overall, integration measures the extent to which the individual identifies with as well as shares and incorporates the normative attitudes and values of instructors and classmates. Satisfactory interaction with the formal and informal academic and social environments of the institution leads to greater integration resulting in persistence. Unpleasant interaction on the other hand discourages integration resulting in lack of persistence. Academic and social integration can be influenced by a variety of factors, including family background characteristics, educational experiences before postsecondary education, and previous academic achievement.

The concept of affiliation or membership captures the multiple communities on campus. Tinto (1993) considers it important for the individual to have multiple affiliations without adopting a single or predominant set of social and academic norms. Being willing to associate with and becoming accepted into an affinity group is critical to individual development and progress in postsecondary education. Affinity groups offer social and academic support that the individual needs to sustain effort through postsecondary education. Sociological research clearly suggests that membership is composed of two dimensions (e.g., Bollen & Hoyle, 1990): One is a sense of belonging; the other is a feeling of morale association.

Tinto (1993) admits that integration and membership are not two separate processes. In fact, he stated that “the concept of ‘membership’ is more useful than ‘integration’ because it implies a greater diversity of participation” (p. 106). Inference from this statement to researchers is that every effort needs to be made to adequately measure the quality of individual membership on campus. Nevertheless, the key measure is the lack of fit (or the level of fit) between the individual and the institution. The individual who has norms, values, and ideas congruent with those of the institution is more likely to persist and graduate from postsecondary education.

Since the publication of Tinto (1993), a new wave of empirical studies has been conducted to examine his revised theory of postsecondary education student attrition. The importance of integration, often examined in the form of engagement and involvement, has been generally supported, and the critical role of membership has also been largely confirmed by recent empirical studies (e.g., Guiffrida, 2003; Handelsman, Briggs, Sullivan, & Towler, 2005; Heisserer & Parette, 2002; Miller & Pope, 2003; Ryan & Glenn, 2003; Schnell & Doetkott, 2003; Zhao, Kuh, & Carini, 2005). Seidman (1996, p. 18) stated that “the Tinto (1975, 1987, 1993) model of retention/attrition has been widely examined, tested and accepted by the educational community since it was first published in 1975.”

The major limitation of Tinto’s (1993) theory that researchers have found relates to his assertion that students must “break away” from past associations and traditions in order to successfully integrate into the (formal and informal) social and academic environments of postsecondary education. Critics have argued that many postsecondary education students, especially religious and minority ones, depend exactly on traditional ties and associations to gain spiritual, cultural, and even material support that sustains them through postsecondary education (Guiffrida, 2005; Kuh & Love, 2000; Rendon, Jalomo, & Nora, 2000; Walker & Schultz, 2001). In conducting the present analysis, both the theory’s success in recognizing the importance of integration and membership and the theory’s failure in recognizing the importance of cultural norms guided us when we considered variables used to predict postsecondary education student attrition and profile postsecondary education dropouts. Tinto (1993) has identified three groups of variables that predict postsecondary education persistence: (a) pre-postsecondary education attributes, (b) integration attributes, and (c) membership attributes.

Pre-postsecondary education attributes as predictors of postsecondary education student attrition. The first group of variables that influence postsecondary education student attrition pertains primarily to pre-postsecondary education conditions of the individual. It includes individual disposition, family background, academic skill and ability, and secondary schooling quality. One important individual disposition is the individual's intention to go to postsecondary education. Manifestation of this intention can often be gauged by the extent to which the individual has indicated clear educational and occupational goals and has thought through potential career options to make a career decision prior to entrance into postsecondary education. Other important individual dispositions include the commitment of the individual to meet his or her educational and occupational goals and the extent to which the individual has prepared himself or herself to willingly comply with the academic and social expectations of postsecondary education.

Integration attributes as predictors of postsecondary education student attrition. Tinto (1993) describes integration mainly in the form of the interactional experiences that the individual has socially and academically after entering postsecondary education, including the quality of individual interactions with other members of the postsecondary education institution (for social and academic supports), the extent to which the individual perceives those interactions as meeting his or her norms, needs, and interests, and the amount of contact with faculty and social networks (for social and academic purposes). Most measures of social and academic integration deal with perception. To a large extent, Tinto (1993) adopted Spady's (1971) empirical definition of perceived integration that emphasizes the subjective sense of being able to fit in on campus, the perception of the existence of warm interpersonal relationships, and the feeling of being unpressured by normative difference with the social and academic environments on campus. This is to say that Spady (1971) and Tinto (1993) have essentially argued that perceptions are valid measures of social and academic integration. This is good news for secondary data analysis of large-scale survey databases in that almost all surveys measure perceptions.

Membership attributes as predictors of postsecondary education student attrition. In Tinto (1993), membership, also an interactional factor by nature, measures the degree to which the individual is socially and academically associated with the postsecondary education community, including informal friendships (on social and academic basis), supportive groups (for social and academic purposes), and participation in extracurricular activities (social and academic). These membership issues are examined within the context of sense of belonging and feeling of morale association. Simply put, membership is an identity issue. Identification with a group based on common or shared morale norms or values is the basis for any membership to occur. Bollen and Hoyle (1990) believe that both cognitive and affective elements are needed for such an occurrence. The individual evaluates his or her role in relation to the group cognitively and such a cognitive appraisal results in an affective response. Implication to empirical research is that both cognitive and affective reactions to campus groups need to be considered in selecting variables measuring membership.

Finally, Tinto (1993) believes that individual integration and membership are often facilitated or hindered by internal and external conditions of the individual, including academic adjustment (a common indicator is grade point average or GPA), preparatory participation (in supportive programs such as orientation), external commitment (family or community duties), and financial need (for tuition, learning material, and accommodation).

Lotkowski's (2004) Meta-analysis of Postsecondary Education Student Attrition

Tinto's (1993) theory of postsecondary education student attrition is our major theoretical framework in that it draws up a blueprint that identifies major players in the issue of postsecondary education persistence. In this sense, Tinto (1993) provides us with what we call structural building blocks. That is, we know that pre-postsecondary education condition, integration, and membership are building blocks for our longitudinal multivariate model. On the other hand, many empirical studies have looked into each block in an effort to identify the critical components of each block. Fortunately, we have identified a recent meta-analysis (a form of quantitative synthesis of empirical studies) of factors influencing postsecondary education student attrition, and we have employed this meta-analysis as our supplementary theoretical framework.

Lotkowski, Robbins, and Noeth's (2004) meta-analysis, *The Role of Academic and Non-academic Factors in Improving College Retention*, is largely based on Tinto's (1993) theory. Because we adopted Tinto (1993) as our major theoretical framework, conceptual consistence between our major and supplementary theoretical frameworks was obtained. This meta-analysis has synthesized out critical academic and non-academic factors (related to pre-postsecondary education condition, integration, and membership) among empirical studies which demonstrate great promises in predicting postsecondary education persistence. Coming from Lotkowski et al. (2004, p. 6), Table 1 identifies variables that need to be considered in empirical data analysis of postsecondary education student attrition.

Table 1 Meta-analytical Results on Academic and Non-academic Factors Influencing College Student Attrition	
Factor	Description
Non-Academic	
Academic goals	Level of commitment to obtain a college degree.
Achievement motivation	Level of motivation to achieve success.
Academic self-confidence	Level of academic self-confidence (of being successful in the academic environment).
Academic-related skills	Time management skills, study skills, and study habits.
Contextual influences	The extent to which students receive financial aid, institution size and selectivity.
General self-concept	Level of self-confidence and self-esteem.
Institutional commitment	Level of confidence in and satisfaction with institutional choice.
Social support	Level of social support a student feels that the institution provides.
Social involvement	Extent to which a student feels connected to the college environment (peers, faculty, campus activities).
Academic	
ACT Assessment score	College preparedness measure in English, mathematics, reading, and science.
High school grade point	Cumulative grade point average student average (HSGPA) earned from all high school courses.
Other	
Socioeconomic status	Parents' educational attainment and family income.
Note: Adopted from Lotkowski, Robbins, and Noeth (2004).	

Lotkowski et al. (2004) described their meta-analysis in relation to the above table and especially how they identified those factors as influential to postsecondary education student attrition:

We used a meta-analysis technique to identify which non-academic factors had the most salient relationship to postsecondary retention. We also identified the extent to which each factor predicted postsecondary retention. This procedure allowed the identification of those factors that were the best indicators of the risk for postsecondary dropout. We also identified the relative contributions of the more traditional academic predictors of college retention including socioeconomic status (SES), high school GPA, and postsecondary readiness scores (ACT Assessment scores). Once identified, the salient nonacademic factors, together with the more traditional academic factors, were examined to see which the best indicators of risk for dropping out were. (p. 5).

We are confident that our major and supplementary theoretical frameworks have provided us with not only a general blueprint of critical structures but also a detailed synthesis of critical factors concerning postsecondary education student attrition. Our selection of variables in relation to the YITS data has therefore been greatly enhanced by these theoretical frameworks. Even the specification of our longitudinal multivariate models has benefited greatly from these theoretical frameworks.

3. Method

Participants

Youth in Transition Survey (YITS) is a multi-component longitudinal project conducted by Statistics Canada. One target population is the 18 to 20 year-old cohort (youths born in the years 1979 to 1981 excluding those from the northern territories, Indian reserves, Canadian Forces bases, and some remote areas). A stratified multi-stage sample design based on the use of the Labour Force Survey sample was employed to draw households from across Canada. Within each household, one person in the target population was pre-selected for YITS. The first cycle of YITS collected data in 2000 when youths were aged between 18 and 20 (this national sample is often referred to as the 18-20 year-old cohort). Two and four years later, in 2002 and 2004, data were collected from the same sample of youths again. The initial YITS sample size at the first cycle was 29,000 youths. By the third cycle, the response rate for the 18-20 year-old cohort was approximately 79%. Participants in the present analysis were youths who took part in the first 3 YITS cycles.

For a fair research of postsecondary education student attrition, it is necessary to exclude youths who went into labor market directly without ever attending any postsecondary education. We thus focused only on the specific sample of youths from the 18-20 year-old cohort who attended postsecondary education for a period of time during the first 3 YITS cycles. For these youths, the definition of postsecondary education status as reported in Shaienks et al. (2006) can be simplified to include graduates (both continuers and non-continuers after graduation), dropouts, and continuers. From an analytical perspective, the last group of youths who by the end of the third YITS cycle were still attending postsecondary education has a critical statistical meaning. Youths in this group are often referred to as *censored cases*. They have not dropped out of postsecondary education by the end of the third YITS cycle. What will happen to them is uncertain. Some may drop out within a week (or month or year) after the third cycle. Some may eventually graduate from postsecondary education. Therefore, postsecondary continuers cannot be treated as either graduates or dropouts. It is imperative that this group of youths be identified and adjusted for credible knowledge claims about postsecondary education student attrition.

Dependent and Independent Measures

Two variables worked together as the dependent measure. One is the length of time the individual persisted until he or she dropped out of postsecondary education. The other is the (postsecondary education) status indicator that separates youths who graduated, dropped out, and censored. The time variable and the status indicator work together to define the occurrence of an event for statistical analysis. In our case, the status indicator was coded categorically as graduates, dropouts, and censors. The time variable was worked out in a longitudinal manner based on survey questions asking whether youths were still taking education or training towards their postsecondary programs by the end of a certain data cycle.

With Tinto (1993) and Lotkowski et al. (2004), postsecondary education dropouts were identified and profiled based on two critical categories: (a) their pre-postsecondary education condition and (b) their postsecondary education integration. With the YITS data, we identified relevant and important independent variables in each category.

Variables descriptive of pre-postsecondary education conditions included (a) individual background (gender, residence location, minority status, and immigration status), (b) individual disposition (academic engagement, social engagement, educational aspiration, and occupational aspiration), (c) high school academic ability (overall GPA, mathematics GPA, language GPA, advanced placement (AP) mathematics coursework, AP language coursework, level of last mathematics course, and level of last language course), and (d) personal problem (dropping out of high school and using drugs in high school).

Variables descriptive of postsecondary education integration included (a) postsecondary education academic ability (time lag between high school graduation and entry into postsecondary education; academic skills in computer, reading, writing, oral communication, problem solving, and mathematics; and first-year postsecondary education GPA), (b) social network (left home to attend postsecondary education, participation in programs to help first-year students, campus residence, small class size—with 35 or fewer students, part-time work reducing opportunities of making friends, campus social support, campus volunteering, and existence of people to talk about personal issues), (c) attitude toward postsecondary education (hours each week spent in studying outside of class, times each month thought about dropping out, times each month cut or skipped class, missed deadlines for assignments, had trouble in keeping up with the workload, was able to relate what was taught to future during the first year, consulted the instructor due to a lack of understanding, felt just a number to this institution—a measure of sense of belonging, and became a good friend with others during the first year), (d) institutional support (number of instructors who had strong teaching abilities and number of instructors who showed an interest in helping students succeed), (e) financial condition (employment insurance, social assistance, scholarship, parent loan, and government loan), (f) personal obligation (single or unmarried and dependent children), and (g) program characteristics (university as postsecondary program; college as postsecondary program; mathematics, science, and technology as postsecondary discipline; and humanity and social science as postsecondary discipline). Some variables were composite, that is a combination or integration of several relevant items. Appendix A presents the coding information on independent variables in detail.

Statistical Technique

We employed survival analysis as our primary statistical technique to analyze postsecondary education student attrition (see, for example, Yamaguchi, 1991). This technique is appropriate for the present analysis because of the existence of censored data. Specifically, we used Cox regression within the family of survival analysis to examine the impact of pre-postsecondary education condition, postsecondary education integration, program characteristics, and financial condition on postsecondary education student attrition (see Appendix B for statistical description of our Cox regression model).

If the group of graduates did not exist, it would be a straightforward survival analysis in which we could easily distinguish between dropouts and censors (individuals still enrolling in their programs). To deal with the presence of graduates, Yamaguchi (1991, p. 139-151) recommended to treat graduates as censored cases. Censored individuals are defined as those who by the end of the observation have not demonstrated the event of interest (dropping out of postsecondary education in our case). Graduates, therefore, fit into this definition of censors. The advantage of Yamaguchi's recommendation is that it is parsimonious in terms of model specification, model estimation, and model interpretation. We argue that this approach is an efficient (and also appealing) alternative or option even after theories and programs become mature to deal with the subtle difference between graduates and censors (i.e., graduates are immune to postsecondary education attrition).

Analytically, we examined each category as different variable blocks (e.g., individual background, individual disposition, high school academic ability, and personal problem as blocks of pre-postsecondary education condition). Within each block, we tested all independent variables together to examine the relative importance of each variable on postsecondary education student attrition. The statistic that we used to evaluate the goodness of fit for this model is $-2LL$ (log likelihood) that compares a built model with the null model without any independent variables. A significant $-2LL$ estimate indicates that, compared with the null model, the built model significantly improves the model-data-fit. We carried out this procedure for each block within a certain category, and we compared $-2LL$ estimates across all blocks to examine which one was most important to postsecondary education student attrition (a smaller significant $-2LL$ indicates a better fit). Finally, we introduced significant independent variables from all blocks into a single survival model and used a backward process to eliminate non-significant independent variables one by one until all remaining variables were significant. This final survival model indicated what independent variables were responsible for postsecondary education student attrition within a certain category.

After we carried out the above procedure for each category, we compared $-2LL$ estimates across the two survival models to examine which category, pre-postsecondary education condition or postsecondary education integration, was more important to postsecondary education student attrition. We also introduced significant independent variables from the two categories into a single survival model. Using a backward process to eliminate non-significant independent variables one by one until all remaining variables were significant, we derived our (grand) final survival model that identified the most salient independent variables critically responsible for postsecondary education student attrition.

Statistical Issues

One of the assumptions of the logit hazard regression model is that of no unobserved heterogeneity. With no error term in the model, it is assumed that all variation in the hazard rate is captured by the independent variables. The estimation of hazard coefficients may be affected if there are other sources of heterogeneity. According to Singer and Willett (1992), the key concern is the “omission of an important independent variable [that] amounts to pooling of heterogeneous populations defined by the different values of the omitted predictor” (p. 38). Although the Cox regression model that we employed shares the same assumption, we are confident that unobserved heterogeneity is not a major concern in our data analysis for two reasons.

First, the omission of important variables is far less likely to occur when sound theories are used to guide variable selection and model specification. This is the very reason why we put a considerable emphasis on our theoretical frameworks. Tinto’s (1993) theory, supplemented by a comprehensive meta-analysis of empirical studies (Lotkowski, et al., 2004), stands little change of omitting variables critical to postsecondary education student attrition. Second, given this data analysis at the national level, we did consider the issue of regional variation, an element that our theoretical frameworks do not adequately address, thus representing a potential source of heterogeneity. Because of the social, economic, and cultural variation across regions, provinces may have differential hazard profiles regarding postsecondary education student attrition. However, this possibility is ruled out given that “the vast majority of provinces had a dropout rate somewhere between 10% and 12%” (Shaienks, et al., 2006, p. 15).

We did face a dilemma though. The comprehensive range of independent variables that we included in our data analysis successfully controls the level of unobserved heterogeneity. On the other hand, inter-correlations among this large number of variables become a statistical issue, with concerns of confounding variables and proxy variables. This situation is especially likely to occur within each category of variables. We therefore examined inter-correlation coefficients for collinearity among variables within each category. We also wanted to make sure no collinearity among variables in the (grand) final survival model (variables that we argued as most important to postsecondary education student attrition) (see Appendix C). Except for the expected high correlation (-0.90) between university and college as postsecondary educational goals, we did not encounter alarmingly high correlations (the highest correlation is -0.64 within the category of pre-postsecondary education condition, 0.60 within the category of postsecondary education integration, and 0.53 within the final survival model). We wanted to emphasize the low correlation among independent variables in our final survival model. Because key policy implications came from those variables, we did need to make sure that the collinearity among those variables is not a major concern in our data analysis. The correlation results essentially confirmed that.

4. Results

We started with descriptive statistics to sketch out the distributional characteristics of dropouts in comparison with continuers and graduates (see Appendix A). For the sake of space, out of a large number of independent variables that we included in our data analysis, we only presented descriptive statistics for variables that were statistically significant within each block because from these variables came our (grand) final survival model. But, credible policy implications come from inferential rather than descriptive analysis of dropouts in terms of individual and institutional characteristics, and we thus focused our interpretation on the results of survival analysis. Because we approached postsecondary education student attrition from the perspective of survival analysis, the hazard functions of independent variables can be illustrative as a part of our descriptive analysis. Again, given the large number of independent variables that we included in our data analysis, we could not graph the hazard functions for every variable. Instead, we decided to graph the hazard functions for some selected independent variables (see Appendix D).

For example, the hazard functions for gender illustrate that as students progress from entering postsecondary education towards graduation, both male and female youths were at increased risk of dropping out of postsecondary education. Therefore, the longer male and female youths stayed in postsecondary education, the more likely they might drop out. But, the male hazard was consistently above the female one, indicating that male youths were more likely than female youths to drop out of postsecondary education.

Effects of Pre-Postsecondary Education Condition on Postsecondary Education Student Attrition

Table 2 concerns the effects of individual background as pre-postsecondary education condition on student attrition in postsecondary education. Gender, age, and residence location showed significant effects, but minority status and immigration status had no significant effects. According to the odds ratio for gender, male youths were 1.62 times more likely than female youths to drop out of postsecondary education. Older youths were more likely than younger youths to drop out of postsecondary education. Consider 2 youths with age 1 year apart, the older one was 1.15 times more likely than the younger one to drop out of postsecondary education. For all odds ratios smaller than 1, we decided to use their reciprocals to make our interpretation format consistent throughout the entire analysis. In case of the odds ratio for residence location, the reciprocal of 0.81 is 1.23. Therefore, rural youths were 1.23 times more likely than urban youths to drop out of postsecondary education.

Table 2			
Effects of Individual Background as Pre-Postsecondary Education Condition on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Male (vs. female)	0.48	0.08	1.62
Age (in year) (continuous)	0.14	0.05	1.15
Urban (vs. rural)	-0.21	0.08	0.81
-2LL	12,050		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Other individual background variables (minority status and immigration status) do not have statistically significant effects on postsecondary education student attrition.			

Table 3 presents the effects of individual disposition as a pre-postsecondary education condition on student attrition in postsecondary education. All variables pertaining to engagement and educational aspiration showed significant effects. Specifically, youths with low academic engagement in high school were 1.27 times more likely than youths with high academic engagement in high school to drop out of postsecondary education, and youths with low social engagement in high school were 1.19 times more likely than youths with high social engagement in high school to drop out of postsecondary education.

Table 3			
Effects of Individual Disposition as Pre-Postsecondary Education Condition on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Engagement			
Academic engagement (continuous)	-0.24	0.05	0.79
Social engagement (continuous)	-0.18	0.04	0.84
Educational aspiration			
University (vs. trade school)	-2.50	0.13	0.08
College (vs. trade school)	-1.04	0.11	0.35
-2LL	11,704		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Another individual disposition variable (occupational aspiration) does not have statistically significant effects on postsecondary education student attrition.			

Some youths set their postsecondary educational goals as trade school or even lower than that. We found that these youths were 12.50 times more likely than youths who set university as their postsecondary educational goals and 2.86 times more likely than youths who set college as their postsecondary educational goals to drop out of postsecondary education. Overall, in terms of the impact of individual disposition, engagement and, in particular, educational aspiration in high school mattered much to youths' decision to drop out of postsecondary education, whereas occupational aspiration in high school did not matter.

Table 4 examines the effects of high school academic ability as a pre-postsecondary education condition on student attrition in postsecondary education. Overall GPA and last language course in high school stood out as significant predictors of postsecondary education student attrition. Specifically, youths with overall GPA at 60% or lower were 10.00 times more likely than youths with overall GPA at 90% or higher, 3.45 times more likely than youths with overall GPA at 80% or higher, and 1.64 times more likely than youths with overall GPA at 70% or higher to drop out of postsecondary education.

Table 4			
Effects of High School Academic Ability as Pre-Postsecondary Education Condition on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Overall grade point average (GPA)			
> 90% (vs. ≤ 60%)	-2.28	0.36	0.10
> 80% (≤ 90%) (vs. ≤ 60%)	-1.25	0.16	0.29
> 70% (≤ 80%) (vs. ≤ 60%)	-0.50	0.11	0.61
Level of last language course			
University preparation (vs. standard preparation)	-1.04	0.17	0.35
College preparation (vs. standard preparation)	-0.24	0.16	0.79
-2LL	11,896		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Other high school academic ability variables (mathematics GPA, language GPA, advanced placement, and level of last mathematics course) do not have statistically significant effects on postsecondary education student attrition.			

Some youths took a standard language course as their last language course in high school, indicating a lack of advanced language coursework. These youths were 2.86 times more likely than youths who took a university preparation language course as their last language course in high school and 1.27 times more likely than youths who took a college preparation language course as their last language course in high school to drop out of postsecondary education. In contrast, mathematics and language GPA, advanced placement in mathematics and language, and last mathematics course in high school did not matter to postsecondary education student attrition.

Table 5 displays the effects of personal problems as pre-postsecondary education condition on student attrition in postsecondary education. School dropout and drug abuse (both dichotomous variables) were considered as personal problems in high school, and with significant effects, they both turned out to be very important to postsecondary education student attrition. Youths who had a record of dropping out of high school were 4.76 times more likely than youths who had no record of dropping out of high school to do the same thing again in postsecondary education—dropping out. Youths who had a record of drug abuse in high school were 1.54 times more likely than youths who had no record of drug abuse in high school to drop out of postsecondary education.

Table 5			
Effects of Personal Problem as Pre-Postsecondary Education Condition on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Dropping out of high school (yes vs. no)	1.56	0.12	4.76
Using drug in high school (yes vs. no)	0.43	0.09	1.54
-2LL	11,993		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect.			

We then gathered the above significant variables together in a single Cox regression to examine the overall impact of pre-postsecondary education condition on student attrition in postsecondary education (see Table 6). Results showed that gender was the only individual background variable remaining significant in the final survival model (gender was more important to postsecondary education student attrition than age and residence location that became non-significant in the final model). Male youths were 1.39 times more likely than female youths to drop out of postsecondary education.

Table 6			
Overall Effects of Pre-Postsecondary Education Condition on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Individual background			
Male (vs. female)	0.33	0.08	1.39
Engagement			
Social engagement (continuous)	-0.18	0.04	0.84
Educational aspiration			
University (vs. trade school)	-2.02	0.14	0.13
College (vs. trade school)	-0.91	0.11	0.40
Overall grade point average (GPA)			
> 90% (vs. ≤ 60%)	-1.36	0.34	0.26
> 80% (≤ 90%) (vs. ≤ 60%)	-0.51	0.13	0.60
Level of last mathematics course			
University preparation (vs. standard preparation)	-0.51	0.16	0.60
Personal problem			
Dropping out of high school (yes vs. no)	0.57	0.14	1.77
Using drugs in high school (yes vs. no)	0.23	0.09	1.26
-2LL	10,639		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect.			

As to individual disposition, social engagement (remaining significant) was more important to postsecondary education student attrition than academic engagement (becoming non-significant). Youths with low social engagement in high school were 1.19 times more likely than youths with high social engagement in high school to drop out of postsecondary education. In addition, both measures of educational aspiration remained significant. Youths who set trade school or lower as their postsecondary educational goals were 7.69 times more likely than youths who set university as their postsecondary educational goals and 2.50 times more likely than youths who set college as their postsecondary educational goals to drop out of postsecondary education.

With regard to high school academic ability, overall GPA at 90% or higher and 80% or higher remained important to postsecondary education student attrition collectively but overall GPA at 70% or higher ceased showing importance. Youths with overall GPA at 60% or lower were 3.85 times more likely than youths with overall GPA at 90% or higher and 1.67 times more likely than youths with overall GPA at 80% or higher to drop out of postsecondary education. Last language course for college preparation was no longer critical to postsecondary education student attrition, but last language course for university preparation remained critical. Youths with standard language course as their last language course in high school were 1.67 times more likely than youths with a university preparation language course as their last language course in high school to drop out of postsecondary education.

Personal problems remained important even collectively to postsecondary education student attrition. Youths with a history of dropping out of high school were 1.77 times more likely than youths with no history of dropping out of high school to do the same thing again in postsecondary education—dropping out. Youths with a history of drug abuse in high school were 1.26 times more likely than youths with no history of drug abuse in high school to drop out of postsecondary education. Therefore, dropping out of high school and using drugs in high school put youths at significantly higher risk of dropping out of postsecondary education.

Effects of Postsecondary Education Integration on Postsecondary Education Student Attrition

Table 7 concerns the effects of academic ability proxied as postsecondary education integration on student attrition. We found that the time lag between high school graduation and entry into postsecondary education was important to dropping out of postsecondary education. Consider 2 high school graduates with this time lag one month apart, the one taking a longer time to enter postsecondary education would be 1.02 times more likely than the one taking a shorter time to enter postsecondary education to drop out of postsecondary education. Students with low computer skill were 1.30 times more likely than students with high computer skill to drop out of postsecondary education. Other academic abilities in postsecondary education such as reading skill, writing skill, oral communication skill, problem solving skill, and mathematical skill did not affect postsecondary education student attrition, however.

Table 7			
Effects of College Academic Ability as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Time lag (in month) since high school graduation			
Entry into postsecondary education (continuous)	0.01	0.01	1.02
College academic ability			
Computer skill (high vs. low)	-0.26	0.12	0.77
College grade point average (GPA)			
> 90% (vs. ≤ 60%)	-1.26	0.30	0.28
> 80% (≤ 90%) (vs. ≤ 60%)	-1.26	0.17	0.28
> 70% (≤ 80%) (vs. ≤ 60%)	-1.06	0.14	0.35
-2LL	4,915		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Other college academic ability variables (reading skill, writing skill, oral communication skill, problem solving skill, and mathematical skill) do not have statistically significant effects on postsecondary education student attrition.			

Finally, we found that first-year postsecondary education GPA was critically predictive of postsecondary education student attrition. Students with first-year postsecondary education GPA at 60% or lower were 3.57 times more likely than students with first-year postsecondary education GPA at 90% or higher, 3.57 times more likely than students with first-year postsecondary education GPA at 80% or higher, and 2.89 times more likely than students with first-year postsecondary education GPA at 70% or higher to drop out of postsecondary education.

Table 8 presents the effects of social network on campus measured as postsecondary education integration on student attrition. In comparison to students who left home to attend postsecondary education, those who did not need to move to attend postsecondary education were 1.59 times more likely to drop out of postsecondary education. Compared with students who resided on campus, those who did not were 1.96 times more likely to drop out of postsecondary education. Interestingly, students who attended small classes with 35 or fewer students were 1.84 times more likely than students who attended larger classes to drop out of postsecondary education.

Table 8			
Effects of Social Network as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Left home to attend postsecondary education (yes vs. no)	-0.47	0.13	0.63
Campus residence (yes vs. no)	-0.67	0.22	0.51
Small class size (35 or fewer) (yes vs. no)	0.61	0.13	1.84
Campus social support (yes vs. no)	-0.25	0.06	0.78
Campus volunteering (yes vs. no)	-0.47	0.14	0.63
Existence of people to talk about personal issues (yes vs. no)	-0.79	0.13	0.45
-2LL	4,775		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Other social network variables (participation in programs to help first-year students and part-time work reducing opportunities of making friends) do not have statistically significant effects on postsecondary education student attrition.			

In comparison to students with social support on campus, those without social support on campus were 1.28 times more likely to drop out of postsecondary education. Compared with students who volunteered on campus, those who did not were 1.59 times more likely to drop out of postsecondary education. The existence of people on campus with whom students could talk about personal issues was critically important to postsecondary education student attrition. Students who did not have such people on campus were 2.22 times more likely than students who had such people on campus to drop out of postsecondary education. Finally, participation in programs designed to help first-year students did not affect postsecondary education student attrition. Even though they experienced reduced opportunities to make friends because of their part-time work, students who pursued part-time work were not necessarily more likely than students who did not pursue part-time work to drop out of postsecondary education.

Table 9 examines the effects of attitude toward postsecondary education as an indicator of postsecondary education integration on student attrition. One less hour each week in time spent in studying outside of class would increase the likelihood of dropping out of postsecondary education by 1.06 times. One more time each month thinking about dropping out of postsecondary education would increase the likelihood of dropping out by 1.48 times. In comparison to students who did not miss deadlines for assignments, those who did were 1.58 times more likely to drop out of postsecondary education. Students who consulted their instructors due to a lack of understanding (often indicating some difficulties in understanding certain content knowledge) were 1.82 times more likely to drop out of postsecondary education, compared with students who did not.

Table 9			
Effects of Attitude toward Postsecondary Education as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Hours each week spent in studying outside of class (continuous)	-0.06	0.01	0.94
Times each month thought about dropping out (continuous)	0.39	0.03	1.48
Missed deadlines for assignments (yes vs. no)	0.46	0.13	1.58
Consulted the instructor due to a lack of understanding (yes vs. no)	0.60	0.15	1.82
Felt just a number to this institution (yes vs. no)	0.26	0.12	1.30
Became a good friend with others during the first year (yes vs. no)	-0.56	0.15	0.57
-2LL	5,464		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Other attitude toward postsecondary education variables (times each month cut or skipped class, had trouble in keeping up with the workload, and enabled to relate what was taught to future during the first year) do not have statistically significant effects on postsecondary education student attrition.			

Some postsecondary education students felt that they were just numbers or statistics to their institutions, indicating a lack of sense of belonging to their institutions. Students who reported such a lack of sense of belonging were 1.30 times more likely than students who did not to drop out of postsecondary education. Students who did not become a good friend to other students on campus during the first year were 1.75 times more likely than students who became a good friend to other students on campus during the first year to drop out of postsecondary education. Finally, times each month that students cut or skipped class, difficulties in keeping up with the workload (course load), and ability to relate what was taught to future during the first year were not related to postsecondary education student attrition.

Table 10 displays the effects of institutional support as a measure of postsecondary education integration on student attrition. One fewer number of instructors who had strong teaching abilities would increase the likelihood of dropping out of postsecondary education by 1.39 times. On the other hand, the number of instructors who showed an interest in helping students succeed did not affect postsecondary education student attrition.

Table 10			
Effects of Institutional Support as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Number of instructors who had strong teaching abilities	-0.33	0.05	0.72
-2LL	5,522		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Another institutional support variable (number of instructors who showed an interest in helping students succeed) does not have statistically significant effects on postsecondary education student attrition.			

Table 11 predicts the effects of financial condition as an indicator of postsecondary education integration on student attrition. On one hand, students who collected employment insurance were 1.35 times more likely than students who did not collect employment insurance to drop out of postsecondary education. Students who collected social assistance were 3.82 times more likely than students who did not collect social assistance to drop out of postsecondary education. On the other hand, students who obtained no scholarship were 5.88 times more likely than students who obtained a scholarship to drop out of postsecondary education. Students who received no loans from parents were 1.96 times more likely than students who received loans from parents to drop out of postsecondary education. Finally, students who received no loans from governments were 1.59 times more likely than students who received loans from governments to drop out of postsecondary education.

Table 11			
Effects of Financial Condition as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Employment insurance (yes vs. no)	0.30	0.15	1.35
Social assistance (yes vs. no)	1.34	0.17	3.82
Scholarship (yes vs. no)	-1.76	0.20	0.17
Parent loan (yes vs. no)	-0.67	0.08	0.51
Government loan (yes vs. no)	-0.47	0.10	0.63
-2LL	11,937		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect.			

Our next block in the category of postsecondary education integration investigates whether personal obligation could impact students' decision to drop out of postsecondary education (see Table 12). We found that marriage during postsecondary education years would increase the likelihood of dropping out of postsecondary education. Specifically, married students were 2.22 times more likely than single students to drop out of postsecondary education. We also found it difficult for students with children to complete postsecondary education. Specifically, students with dependent children were 2.03 times more likely than students without dependent children to drop out of postsecondary education. Some algebraic manipulation readily produced a combined effect of -0.08 for married students with dependent children. This effect indicates that married students with dependent children would be 12.50 times more likely to drop out of postsecondary education than single students without dependent children.

Table 12			
Effects of Personal Obligation as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Single (not married) (vs. married)	-0.79	0.15	0.45
Dependent children (yes vs. no)	0.71	0.21	2.03
-2LL	12,169		
Note. All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect.			

Our last block measuring postsecondary education integration deals with program characteristics as they relate to students' decision to drop out of postsecondary education (see Table 13). Some youths attended trade school or even lower as their postsecondary program. We found that although these youths were no different from youths who attended college as their postsecondary program in terms of dropping out of postsecondary education, these youths were 5.56 times more likely than youths who attended university as their postsecondary program to drop out of postsecondary education. We also examined the impact of postsecondary discipline (or area of study) on postsecondary education student attrition. Specifically, we examined whether students in majors of mathematics, science, and technology were more likely to drop out of postsecondary education and whether students in majors of humanity and social science were more likely to drop out of postsecondary education. In both cases, we found no evidence. We concluded that neither mathematics, science, and technology as postsecondary discipline nor humanity and social science as postsecondary discipline would increase the risk of dropping out of postsecondary education.

Table 13			
Effects of Program Characteristics as Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
University (vs. trade school) as postsecondary program	-1.71	0.29	0.18
-2LL	3,973		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect. Other program characteristics variables (college as postsecondary program; mathematics, science, and technology as postsecondary discipline; and humanity and social science as postsecondary discipline) do not have statistically significant effects on postsecondary education student attrition.			

A comparison of $-2LL$ as an indicator of model-data-fit across those blocks of postsecondary education integration revealed interesting results. We repeat that with the null model as the common reference, the smaller the $-2LL$ the better the model-data-fit. We found that the two most important blocks (with the best model-data-fit statistics) pertained to program characteristics and social network whereas the two least important blocks (with the worst model-data-fit statistics) pertained to personal obligation and financial condition. These results indicated that variance in postsecondary education student attrition was related much more with program characteristics and social network than personal obligation and financial condition.

We then gathered all significant variables from Tables 7 to 13 together in a single survival model to examine the overall impact of postsecondary education integration on student attrition in postsecondary education. Results are shown in Table 14. For the block of academic ability, the time lag between high school graduation and entry into postsecondary education was no longer a predictor of postsecondary education student attrition. So was computer skill as postsecondary education academic ability. First-year postsecondary education GPA, however, remained critical to postsecondary education student attrition, even in the presence of other postsecondary education integration measures. Students with first-year postsecondary education GPA at 60% or lower were 2.94 times more likely than students with first-year postsecondary education GPA at 90% or higher, 2.38 times more likely than students with first-year postsecondary education GPA at 80% or higher, and 2.13 times more likely than students with first-year postsecondary education GPA at 70% or higher to drop out of postsecondary education.

Table 14			
Overall Effects of Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
College grade point average (GPA)			
> 90% (vs. ≤ 60%)	-1.07	0.32	0.34
> 80% (≤ 90%) (vs. ≤ 60%)	-0.87	0.19	0.42
> 70% (≤ 80%) (vs. ≤ 60%)	-0.76	0.15	0.47
Social network			
Campus volunteering (yes vs. no)	-0.35	0.14	0.70
Existence of people to talk about personal issues (yes vs. no)	-0.43	0.14	0.65
Attitude toward postsecondary education			
Hours each week spent in studying outside of class (continuous)	-0.04	0.01	0.96
Times each month thought about dropping out (continuous)	0.24	0.04	1.27
Felt just a number to this institution (yes vs. no)	0.39	0.14	1.48
Financial condition			
Social assistance (yes vs. no)	1.11	0.27	3.03
Scholarship (yes vs. no)	-1.48	0.31	0.23
Parent loan (yes vs. no)	-0.89	0.13	0.41
Personal obligation			
Single (not married) (vs. married)	-0.75	0.20	0.47
University (vs. trade school) as postsecondary program	-1.62	0.26	0.20
-2LL	4,645		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect.			

For the block of social network, left home to attend postsecondary education, campus residence, small class size, and campus social support were no longer predictive of postsecondary education student attrition in the presence of other measures of postsecondary education integration. Two variables from this block, however, remained critical to postsecondary education student attrition. Compared with students who volunteered on campus, those who did not were 1.43 times more likely to drop out of postsecondary education. Students who did not have people on campus to talk about personal issues were 1.54 times more likely than students who had such people on campus to drop out of postsecondary education.

In terms of attitude toward postsecondary education, missed deadlines for assignments, asked the instructor due to a lack of understanding, and became a good friend with other students during the first year were no longer predictors of postsecondary education student attrition in the presence of other postsecondary education integration measures. Three variables from this block remained critical to postsecondary education student attrition. One less hour each week in time spent in studying outside of class would increase the likelihood of dropping out of postsecondary education by 1.04 times. One more time each month thinking about dropping out of postsecondary education would increase the likelihood of dropping out of postsecondary education by 1.27 times. Students who reported a lack of sense of belonging to their institution (as they felt that they were just a number to their institutions) were 1.48 times more likely than students who did not to drop out of postsecondary education.

Institutional support was no longer an important block of postsecondary education integration in the presence of other postsecondary education integration blocks. The number of instructors who had strong teaching abilities, a variable previously predictive of postsecondary education student attrition, was no longer a predictor. Note that this is the only block in the category of postsecondary education integration that disappeared entirely in the combined (or joint) survival model.

Financial condition remained as an important block even though employment insurance and loans from governments ceased being predictors of postsecondary education student attrition in the presence of other postsecondary education integration measures. Still, students who collected social assistance were 3.03 times more likely than students who did not to drop out of postsecondary education. Students who obtained no scholarship were 4.35 times more likely than students who obtained scholarship to drop out of postsecondary education. Students who received no loans from parents were 2.43 times more likely than students who received loans from parents to drop out of postsecondary education.

As to personal obligation, having dependent children during postsecondary education years was no longer associated with an increased risk of dropping out of postsecondary education in the presence of other measures of postsecondary education integration, but married students were still 2.13 times more likely than single students to drop out of postsecondary education.

Finally, program characteristics remained critically important to postsecondary education student attrition. The single significant variable in that block, university as postsecondary program, remained significant in the presence of other postsecondary education integration measures. In fact, youths who attended trade school (or lower) as their postsecondary program were 5.00 times more likely than youths who attended university as their postsecondary program to drop out of postsecondary education.

Effects of Pre-Postsecondary Education Condition and Postsecondary Education Integration

In our final step of data analysis, we combined all significant predictors from both pre-postsecondary education condition (Table 6) and postsecondary education integration (Table 14) to examine their overall effects on student attrition in postsecondary education. Table 15 presents the overall picture of postsecondary education students as they sustained through or dropped out of postsecondary education conditional on variables from the two categories. This table served to identify reasons for postsecondary education student attrition and profile postsecondary education dropouts. What strikes us first about the overall effects is that most significant predictors identified within the categories of pre-postsecondary education condition and postsecondary education integration were highly stable or consistent. This is particularly true regarding the effects of postsecondary education integration. A comparison between Table 15 and Table 14 showed that all but one significant predictor of postsecondary education student attrition from the category of postsecondary education integration maintained their predictive significance in the presence of significant pre-postsecondary education condition variables. The only variable that disappeared is hours each week spent in studying outside of class that was no longer a predictor of postsecondary education student attrition.

Table 15			
Overall Effects of Pre-Postsecondary Education Condition and Postsecondary Education Integration on Student Attrition in Postsecondary Education			
Variable	Effect	SE	Exp
Pre-college condition			
Individual background			
Male (vs. female)	0.49	0.13	1.64
Individual disposition			
University (vs. trade school) as educational aspiration	-2.37	0.23	0.09
College (vs. trade school) as educational aspiration	-1.35	0.17	0.26
Personal problem			
Dropping out of high school (yes vs. no)	1.01	0.26	2.74
Using drugs in high school (yes vs. no)	0.30	0.14	1.35
College integration			
College grade point average (GPA)			
> 90% (vs. ≤ 60%)	-1.27	0.36	0.28
> 80% (≤ 90%) (vs. ≤ 60%)	-0.81	0.19	0.45
> 70% (≤ 80%) (vs. ≤ 60%)	-0.65	0.16	0.52
Social network			
Campus volunteering (yes vs. no)	-0.33	0.15	0.72
Existence of people to talk about personal issues (yes vs. no)	-0.38	0.14	0.69
Attitude toward postsecondary education			
Times each month thought about dropping out (continuous)	0.22	0.04	1.24
Felt just a number to this institution (yes vs. no)	0.33	0.15	1.39
Financial condition			
Social assistance (yes vs. no)	0.79	0.28	2.21
Scholarship (yes vs. no)	-1.34	0.31	0.26
Parent loan (yes vs. no)	-0.81	0.13	0.45
Personal obligation			
Single (not married) (vs. married)	-0.62	0.21	0.54
University (vs. trade school) as postsecondary program	-0.66	0.30	0.52
-2LL	4,441		
Note: All effects are statistically significant at the alpha level of 0.05. Exp, commonly expressed as odds ratio, denotes the regression result in terms of e raised to the power of each effect.			

After all, students with first-year postsecondary education GPA at 60% or lower were 3.57 times more likely than students with first-year postsecondary education GPA at 90% or higher, 2.22 times more likely than students with first-year postsecondary education GPA at 80% or higher, and 1.92 times more likely than students with first-year postsecondary education GPA at 70% or higher to drop out of postsecondary education.

Compared with students who volunteered on campus, those who did not were 1.39 times more likely to drop out of postsecondary education. Students who did not have people on campus to talk about personal issues were 1.45 times more likely than students who had such people on campus to drop out of postsecondary education. One more time each month thinking about dropping out of postsecondary education would increase the likelihood of dropping out by 1.24 times. Students who reported a lack of sense of belonging to their institutions were 1.39 times more likely than students who did not to drop out of postsecondary education.

Students who collected social assistance were 2.21 times more likely than students who did not to drop out of postsecondary education. Students who obtained no scholarship were 3.85 times more likely than students who obtained scholarship to drop out of postsecondary education. Students who received no loans from parents were 2.22 times more likely than students who received loans from parents to drop out of postsecondary education. Married students were 1.85 times more likely than single students to drop out of postsecondary education. Youths who attended trade school (or lower) as their postsecondary program were 1.92 times more likely than youths who attended university as their postsecondary program to drop out of postsecondary education.

Although their stability or consistency appeared reasonable from a comparison between Table 15 and Table 6, the effects of pre-postsecondary education condition were relatively not as stable as those of postsecondary education integration. Social engagement from the block of individual disposition was no longer a predictor of postsecondary education student attrition. So was high school GPA representing the block of high school academic ability. In fact, high school academic ability disappeared entirely in the final survival model. A comparison in *-2LL* between the overall pre-postsecondary education condition model and the overall postsecondary education integration model also indicated that postsecondary education integration accounted for much more variance in postsecondary education student attrition than pre-postsecondary education condition.

After all, male youths were 1.64 times more likely than female youths to drop out of postsecondary education. Youths who set trade school or lower as their postsecondary educational goals were 11.11 times more likely than youths who set university as their postsecondary educational goals and 3.85 times more likely than youths who set college as their postsecondary educational goals to drop out of postsecondary education. Youths with a history of dropping out of high school were 2.74 times more likely than youths with no history of dropping out of high school to do the same thing again in postsecondary education—dropping out. Youths with a history of drug abuse in high school were 1.35 times more likely than youths with no history of drug abuse in high school to drop out of postsecondary education.

5. Discussion

The present analysis employed the latest Youth in Transition Survey (YITS) data to investigate postsecondary education student attrition in Canada. Using Tinto (1993) and Lotkowski et al. (2004) as our theoretical frameworks, we identified and profiled postsecondary education dropouts based on their pre-postsecondary education condition and their postsecondary education integration. Although YITS is not designed as full-scale research on postsecondary education student attrition, we located a fairly large number of relevant variables, guided by our theoretical frameworks. In total, we employed 4 blocks of variables pertaining to pre-postsecondary education condition including individual background, individual disposition, high school academic ability, and personal problem; and we employed 7 blocks of variables pertaining to postsecondary education integration including academic ability, social network, attitude toward postsecondary education, institutional support, financial condition, personal obligation, and program characteristics. Overall, there were more than 2 dozens of variables from all these blocks, and we examined their effects on student attrition in postsecondary education.

The majority of blocks within each category turned out to be important to postsecondary education student attrition. In the (grand) final survival model portraying student attrition in postsecondary education, 3 out of 4 blocks pertaining to pre-postsecondary education condition were present (individual background, individual disposition, and personal problem as significant predictors with the exception of high school academic ability), and 6 out of 7 blocks pertaining to postsecondary education integration were present (academic ability, social network, attitude toward postsecondary education, financial condition, personal obligation, and program characteristics as significant predictors with the exception of institutional support). Finally, using a model-data-fit index ($-2LL$), we found that postsecondary education integration accounted for much more variance in postsecondary education student attrition than pre-postsecondary education condition. We consider this result as an indication that postsecondary education integration is more relevant than pre-postsecondary education condition to student attrition in postsecondary education.

Profiling Postsecondary education Dropouts in Canada

Our final survival model (see Table 15) has provided a good lens to look into the issue of postsecondary education student attrition in Canada. Our profile of postsecondary education dropouts is about a group of youths in the Canadian population who attend postsecondary education at age between 18-20 and 22-24. In other words, we have a window of 4 years to follow this group of 18-20 year olds as they pursue their postsecondary education.

Postsecondary education dropouts in Canada tend to be male in gender. On the pre-postsecondary education front, these youths tend to set a low postsecondary educational goal—instead of planning to go to university or college they tend to opt for trade school or technical school. Canadian postsecondary education dropouts tend to have an experience of dropping out of high school and an experience of drug abuse in high school.

Canadian postsecondary education dropouts tend to struggle with academic work in their first year of postsecondary education (their Grade Point Average (GPA) tends to be below 60% in the first year). Canadian postsecondary education dropouts tend to fare poorly in social networking. These youths tend to show no interest in volunteering work on campus, and they tend to have nobody on campus to talk about their personal issues.

Dropping out of postsecondary education is not a “sudden event” in Canada. Dropouts tend to have a history of struggling (at least monthly) with the thought of quitting postsecondary education. These youths tend to report a lack of sense of belonging to their institutions (or a problem of fitting themselves into their institutions).

Finance tends to be an issue in the life of postsecondary education dropouts in Canada. These youths tend to be ones who collect social assistance, and Canadian postsecondary education dropouts tend to receive neither scholarships from institutions nor loans from parents. In addition, Canadian postsecondary education dropouts tend to get married during the postsecondary education years. Finally, postsecondary education dropouts in Canada tend to be those who enroll in trade school or technical school as their postsecondary programs.

Main Reasons for Postsecondary Education Student Attrition

Conditions that we have profiled are all relevant reasons for postsecondary education students to drop out in Canada. To distinguish key reasons from secondary reasons that cause postsecondary education student attrition, we relied both on model-data-fit statistics and odds ratio magnitudes. Our findings indicate that, overall, program characteristics, social network, postsecondary education academic ability, and attitude toward postsecondary education in this order are the major reasons for Canadian postsecondary education students to drop out. These blocks reduced variance in postsecondary education student attrition more than twice as much as other blocks.

One major reason why Canadian youths drop out of postsecondary education is because they fail to pursue university studies as their postsecondary programs (they instead opt for programs in trade school or technical school for various reasons). Our findings indicate that university studies alone are preventive of postsecondary education student attrition. Note that even taking programs in college warrants no better prevention to dropping out of postsecondary education than opting for programs in trade school. Of course, we realize that taking programs at university may be a surrogate that covers up some more fundamental (cognitive and affective) causes. Still, we consider youths who choose to attend university rather than college or trade school are well prepared on multiple fronts (e.g., aspiration, motivation, commitment, ability, and hard work).

An inadequate social network is another major reason for postsecondary education youths to drop out. Having nobody on campus with whom youths feel comfortable to talk about personal issues is a major cause for youths to drop out of postsecondary education. Not pursuing volunteering work on campus is another major cause. We believe that community work by itself does not really matter to postsecondary education student attrition. Our analysis seems to indicate that volunteering is a very effective way to establish social network. For example, people whom youths helped in the past may well be people from whom they can

draw support later on. At very least, volunteering on campus is simply a good way to get to know more people and make more friends.

We also found that not being able to do well in academic coursework during the first year of postsecondary education is a major reason for Canadian youths to drop out of postsecondary education. First-year GPA is highly characteristic of postsecondary education dropouts. We believe that in this case first-year postsecondary education GPA may well be another surrogate that sums up a whole array of academic abilities.

If first-year postsecondary education GPA reveals the cognitive side of postsecondary education student attrition, then attitude toward postsecondary education reveals its affective side. Lacking a sense of belonging to their institutions is a major reason for Canadian youths to drop out of postsecondary education. We also found that the thought of dropping out of postsecondary education, another major reason for student attrition in Canada, is just as harmful as the action of dropping out of postsecondary education; and it does lead as a major cause to the actual event of dropping out.

Brief Revisit to Tinto (1993)

In general, the findings of our analysis lend support to Tinto's (1993) theory. Variance in postsecondary education student attrition turned out in our analysis to be more related to postsecondary education integration (including membership) than pre-postsecondary education condition. Within the category of postsecondary education integration, we located measures to match Tinto's (1993) notions of academic integration and social integration. Our analytical results suggest that academic integration (highlighted by postsecondary education GPA in our analysis) and social integration (highlighted by social network and attitude toward postsecondary education in our analysis) are critical predictors of postsecondary education student attrition. Better still, these conclusions were reached after taking into account pre-postsecondary education condition (individual background, individual disposition, and personal problem) as well as financial condition, personal obligation, and program characteristics at the postsecondary education level. Our conclusion therefore is that academic integration and social integration appear to be quite robust as salient predictors of postsecondary education student attrition.

6. References

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Appendix A-1

Coding and Descriptive Information of Pre-Postsecondary Education Condition

Coding and Descriptive Information of Pre-Postsecondary Education Condition			
Pre-postsecondary education condition	Dropouts	Censors	Overall
Individual characteristics			
Male (= 1 vs. female = 0)	56.6	45.4	46.0
Age (in year)	19.1	18.9	19.0
Urban (= 1 vs. rural = 0)	67.5	70.6	70.5
Individual disposition			
Academic engagement (standardized score × 10)	-1.6	2.2	2.0
Social engagement (standardized score × 10)	-1.9	1.4	1.2
Postsecondary educational goals: university (= 1 vs. trade school = 0)	24.4	58.0	55.9
Postsecondary educational goals: college (= 1 vs. trade school = 0)	58.0	37.5	38.7
High school academic ability			
Overall GPA > 90% (= 1 vs. < 60% = 0)	1.7	9.2	8.8
Overall GPA > 80% < 90% (= 1 vs. < 60% = 0)	20.5	37.7	36.7
Overall GPA > 70% < 80% (= 1 vs. < 60% = 0)	51.2	40.6	41.2
Last language course: university preparation (= 1 vs. standard = 0)	51.7	21.5	66.2
Last language course: college preparation (= 1 vs. standard = 0)	67.1	10.5	11.2
Personal problem			
Dropping out of high school (yes = 1 vs. no = 0)	13.3	3.8	4.4
Using drug in high school (yes = 1 vs. no = 0)	29.7	20.0	20.6
Note: For the sake of space, only statistically significant independent variables within each block (individual characteristics, individual disposition, high school academic ability, and personal problem) are presented. Most independent variables are dichotomous with means indicating percentages. Censors include both continuers and graduates.			

Appendix A-2

Coding and Descriptive Information of Postsecondary Education Integration

Coding and Descriptive Information of Postsecondary Education Integration			
Postsecondary education integration	Dropouts	Censors	Overall
Postsecondary education academic ability			
Time lag (graduation from high school and entry into postsecondary education) (in month)	6.5	5.6	5.6
Computer skill (high = 1 vs. low = 0)	34.6	41.7	41.3
First-year postsecondary education GPA > 90% (= 1 vs. < 60% = 0)	4.3	41.7	41.3
First-year postsecondary education GPA > 80% < 90% (= 1 vs. < 60% = 0)	17.1	28.6	28.1
First-year postsecondary education GPA > 70% < 80% (= 1 vs. < 60% = 0)	30.7	41.5	41.1
Social network			
Left home to attend postsecondary education (yes = 1 vs. no = 0)	19.3	16.0	16.2
Campus residence (yes = 1 vs. no = 0)	8.8	20.8	20.3
Small class size (35 or fewer) (yes = 1 vs. no = 0)	63.9	48.5	49.1
Campus social support (standardized score × 10)	-1.2	1.6	1.5
Campus volunteering (yes = 1 vs. no = 0)	28.1	40.6	39.9
Existence of people to talk about personal issues (yes = 1 vs. no = 0)	66.6	83.8	83.2
Attitude toward postsecondary education			
Hours each week spent in studying outside of class	7.7	11.2	11.0
Times each month thought about dropping out	1.8	0.6	0.6
Missed deadlines for assignments (yes = 1 vs. no = 0)	32.1	15.0	15.7
Consulted the instructor due to a lack of understanding (yes = 1 vs. no = 0)	81.0	81.1	81.2
Felt just a number to this institution (yes = 1 vs. no = 0)	60.3	45.5	45.9
Became a good friend with others during the first year (yes = 1 vs. no = 0)	78.2	92.0	91.4
Institutional support			
Number of instructors who had strong teaching abilities	2.7	2.8	2.8

Appendix A-2 (continued)			
Coding and Descriptive Information of Postsecondary Education Integration			
Postsecondary education integration	Dropouts	Censors	Overall
Financial condition			
Employment insurance (yes = 1 vs. no = 0)	7.0	5.0	5.0
Social assistance (yes = 1 vs. no = 0)	8.0	5.1	6.1
Scholarship (yes = 1 vs. no = 0)	4.0	21.0	20.0
Parent loan (yes = 1 vs. no = 0)	44.0	61.0	60.0
Government loan (yes = 1 vs. no = 0)	15.1	17.0	16.5
Personal obligation			
Single (= 1 vs. married = 0)	91.5	96.1	95.8
Dependent children (yes = 1 vs. no = 0)	3.9	1.7	1.9
Program characteristics			
University program (= 1 vs. trade school program = 0)	9.0	34.4	32.0
College program (= 1 vs. trade school program = 0)	33.9	34.9	34.8
<p>Note: For the sake of space, only statistically significant independent variables within each block (postsecondary education academic ability, social network, attitude toward postsecondary education, institutional support, financial condition, personal obligation, and program characteristics) are presented. Most independent variables are dichotomous with means indicating percentages. Censors include both continuers and graduates.</p>			

Appendix B

Description of Cox Regression Model

Like most life table techniques, Cox regression is a technique for modeling time-to-event data in the presence of censored cases (Cox, 1972). As an advantage over most life table techniques, Cox regression allows the inclusion of independent variables as predictors of the event of interest. Cox regression is appropriate for our data analysis because it allows us to examine the impact of multiple independent variables on postsecondary education student attrition (dropout rate). Specifically, we used the continuous-time proportional hazards model in the family of Cox regression. The proportional hazards model specifies hazard rates as a log-linear function of parameters for the effect of covariates (independent variables) (see Yamaguchi, 1991):

$$h_i(t) = h_0(t) \exp\left(\sum_{k=1}^K \beta_k X_{ik}(t)\right)$$

where $h_i(t)$ is the hazard rate value for person i at time t , $h_0(t)$ is the baseline hazard function that represents the major dimension of time dependence, and $X_{ik}(t)$ is the value of the k th covariate for person i at time t . In our case, the hazard rate $h_i(t)$ is the dropout rate (postsecondary education student attrition), and those X variables describe the characteristics of pre-postsecondary education condition and postsecondary education integration (see Appendix A) as predictors of the dropout rate. Unique assumptions underlying Cox regression model is the presence of proportional hazard and the absence of unobserved heterogeneity. The model also assumes that the log hazard of the covariates is additive.

The baseline hazard function $h_0(t)$ is the hazard function for persons with all covariates equal to 0. In fact, $h_0(t)$ can take on different functional properties. If $h_0(t)$ is specified, the maximum likelihood estimation needs to be used. Often, $h_0(t)$ is left unspecified, however. In this case, the cumulative baseline hazard can be estimated from sample data, and many statisticians believe that this approach is often useful. If $h_0(t)$ is not given any functional form, Cox's PL estimation can be employed.

In our case, we used *SPSS* as our analytical framework. In *SPSS*, parameters (coefficients for those X variables) in Cox regression are estimated by a form of maximum likelihood, with $h_0(t)$ left unspecified but estimated from sample data (see Collett, 2003). Statistically significant covariates (independent variables) are determined according to the alpha level of 0.05.

Results of Cox regression are commonly expressed as odds ratio (Exp) that denotes the regression result in terms of e raised to the power of each effect. The interpretation of each parameter β_k is that $\text{Exp}(\beta_k)$ indicates the hazard ratio, the factor change associated with an increase of one unit in X_{ik} , with all other covariates statistically held constant.

Appendix C-1

Inter-Correlation Coefficients of Pre-Postsecondary Education Condition

Inter-Correlation Coefficients of Pre-Postsecondary Education Condition														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Male	1.00													
2. Age	-0.01	1.00												
3. Urban	-0.01	0.05	1.00											
4. Academic engagement	-0.21	-0.02	-0.03	1.00										
5. Social engagement	-0.09	-0.03	-0.02	0.33	1.00									
6. Postsecondary educational goals: university	-0.07	-0.02	0.13	0.19	0.15	1.00								
7. Postsecondary educational goals: college	0.06	0.02	-0.11	-0.14	-0.12	-0.90	1.00							
8. Overall GPA > 90%	-0.04	-0.02	0.00	0.15	0.10	0.21	-0.19	1.00						
9. Overall GPA > 80% < 90%	-0.10	0.02	0.02	0.20	0.11	0.23	-0.19	-0.24	1.00					
10. Overall GPA > 70% < 80%	0.05	-0.01	-0.01	-0.09	-0.06	-0.17	0.15	-0.26	-0.64	1.00				
11. Last language course: university preparation	-0.05	-0.02	0.02	0.02	-0.05	0.25	-0.20	0.09	0.06	-0.07	1.00			
12. Last language course college preparation	0.07	0.01	-0.04	-0.13	-0.12	-0.26	0.22	-0.08	-0.12	0.05	-0.50	1.00		
13. Dropping out of high school	-0.00	0.04	0.01	-0.18	-0.15	-0.15	0.04	-0.05	-0.08	-0.01	-0.09	0.07	1.00	
14. Using drug in high school	0.10	0.03	0.04	-0.26	-0.03	-0.05	0.03	-0.06	-0.05	0.03	-0.10	0.01	0.10	1.00

Note: For the sake of space, only statistically significant independent variables within each block (individual characteristics, individual disposition, high school academic ability, and personal problem) are presented.

Appendix C-2

Inter-Correlation Coefficients of Postsecondary Education Integration (Part I)

Inter-Correlation Coefficients of Postsecondary Education Integration (Part I)																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Time lag (graduation from high school and entry into postsecondary education)	1.00																	
2. Computer skill	-0.07	1.00																
3. First-year postsecondary education GPA > 90%	0.07	-0.04	1.00															
4. First-year postsecondary education GPA > 80% < 90%	0.00	-0.00	-0.18	1.00														
5. First-year postsecondary education GPA > 70% < 80%	-0.02	0.04	-0.24	-0.52	1.00													
6. Left home to attend postsecondary education	0.02	-0.03	0.05	0.03	-0.04	1.00												
7. Campus residence	-0.09	0.05	-0.03	-0.06	0.02	0.11	1.00											
8. Small class size	0.07	-0.09	0.11	0.12	-0.06	0.02	-0.20	1.00										
9. Campus social support	-0.06	0.12	-0.00	0.03	0.03	0.03	0.07	-0.06	1.00									
10. Campus volunteering	-0.03	0.06	0.01	0.00	0.01	0.01	0.11	-0.10	0.12	1.00								
11. Existence of people to talk about personal issues	-0.05	0.03	0.02	0.07	-0.00	0.02	0.11	0.02	0.11	0.04	1.00							
12. Hours each week spent in studying outside of class	-0.07	0.09	-0.01	0.06	0.03	0.02	0.12	-0.14	0.10	0.09	0.05	1.00						
13. Times each month thought about dropping out	0.01	-0.05	-0.08	-0.14	-0.03	0.04	-0.03	0.00	-0.06	-0.01	-0.16	-0.05	1.00					

Appendix C-2 (continued)
Inter-Correlation Coefficients of Postsecondary Education Integration (Part I)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
14. Missed deadlines for assignments	-0.02	-0.06	-0.08	-0.12	-0.05	0.02	-0.01	0.03	-0.07	-0.02	-0.05	-0.11	0.19	1.00				
15. Consulted the instructor due to a lack of understanding	0.05	-0.05	0.14	0.15	-0.04	0.03	-0.03	0.22	0.03	-0.04	0.15	-0.00	-0.21	-0.12	1.00			
16. Felt just a number to this institution	-0.05	0.06	-0.11	-0.15	0.03	0.01	0.08	-0.30	-0.02	0.05	-0.14	0.04	0.19	0.10	-0.43	1.00		
17. Became a good friend with others during the first year	-0.03	0.02	0.01	0.05	0.02	0.01	0.11	0.01	0.04	0.02	0.35	0.06	-0.16	-0.05	0.12	-0.11	1.00	
18. Number of instructors who had strong teaching abilities	0.03	-0.05	0.10	0.11	-0.02	-0.01	-0.03	0.17	0.05	-0.04	0.14	0.01	-0.19	-0.08	0.60	-0.34	0.10	1.00

Note: For the sake of space, only statistically significant independent variables within each block (postsecondary education academic ability, social network, attitude toward postsecondary education, and institutional support) are presented. Given the large number of independent variables in this category, more contextually oriented variables are set aside for the next table in order to make the presentation possible.

Appendix C-3

Inter-Correlation Coefficients of Postsecondary Education Integration (Part II)

Inter-Correlation Coefficients of Postsecondary Education Integration (Part II)									
	1	2	3	4	5	6	7	8	9
1. Employment insurance	1.00								
2. Social assistance	-0.00	1.00							
3. Scholarship	-0.05	-0.03	1.00						
4. Parent loan	-0.08	-0.07	0.06	1.00					
5. Government loan	0.05	0.12	-0.03	-0.06	1.00				
6. Single	-0.06	-0.09	0.03	0.05	-0.08	1.00			
7. Dependent children	0.09	0.44	-0.03	-0.07	0.18	-0.23	1.00		
8. University program	0.03	-0.01	-0.10	-0.03	0.00	-0.06	-0.00	1.00	
9. College program	-0.07	-0.07	0.33	0.11	0.07	0.08	-0.07	-0.50	1.00

Note: For the sake of space, only statistically significant independent variables within each block (financial condition, personal obligation, and program characteristics) are presented.

Appendix C-4

Inter-Correlation Coefficients of Variables in the Final Survival Model

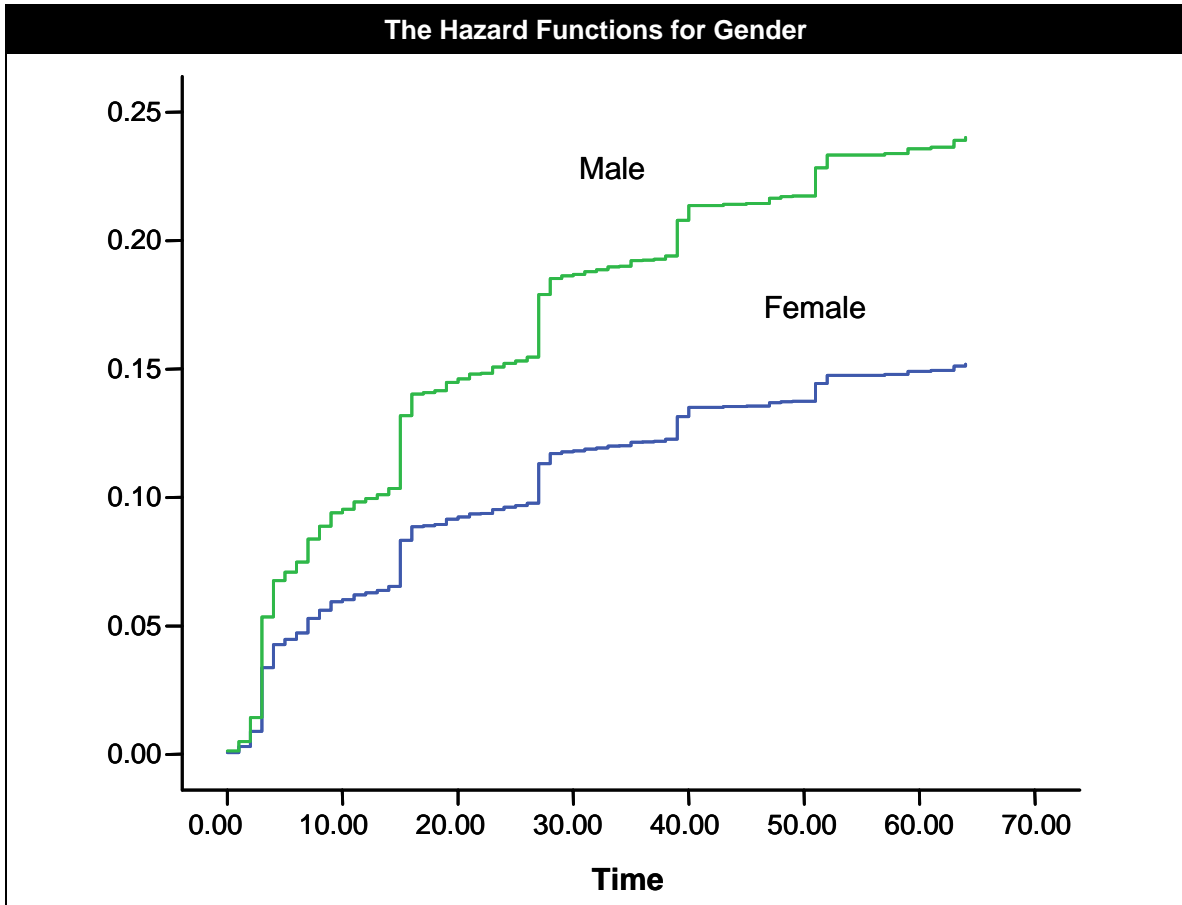
Inter-Correlation Coefficients of Variables in the Final Survival Model																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Male	1.00																
2. Postsecondary educational goals: university	-0.07	1.00															
3. Postsecondary educational goals: college	0.05	-0.90	1.00														
4. Dropping out of high school	-0.00	-0.15	0.04	1.00													
5. Using drug in high school	0.10	-0.05	0.03	0.10	1.00												
6. First-year postsecondary education GPA > 90%	-0.02	-0.10	0.09	0.08	-0.02	1.00											
7. First-year postsecondary education GPA > 80% < 90%	-0.04	-0.02	0.03	0.01	-0.02	-0.18	1.00										
8. First-year postsecondary education GPA > 70% < 80%	-0.02	0.06	-0.05	-0.04	0.01	-0.24	-0.52	1.00									
9. Campus volunteering	-0.06	0.19	-0.18	-0.05	-0.05	0.01	0.00	0.01	1.00								
10. Existence of people to talk about personal issues	-0.04	0.03	-0.02	-0.04	-0.01	0.02	0.07	-0.00	0.04	1.00							
11. Times each month thought about dropping out	-0.05	-0.10	0.07	0.02	0.07	-0.08	-0.14	-0.03	-0.01	-0.16	1.00						

Appendix C-4 (continued)
Inter-Correlation Coefficients of Variables in the Final Survival Model

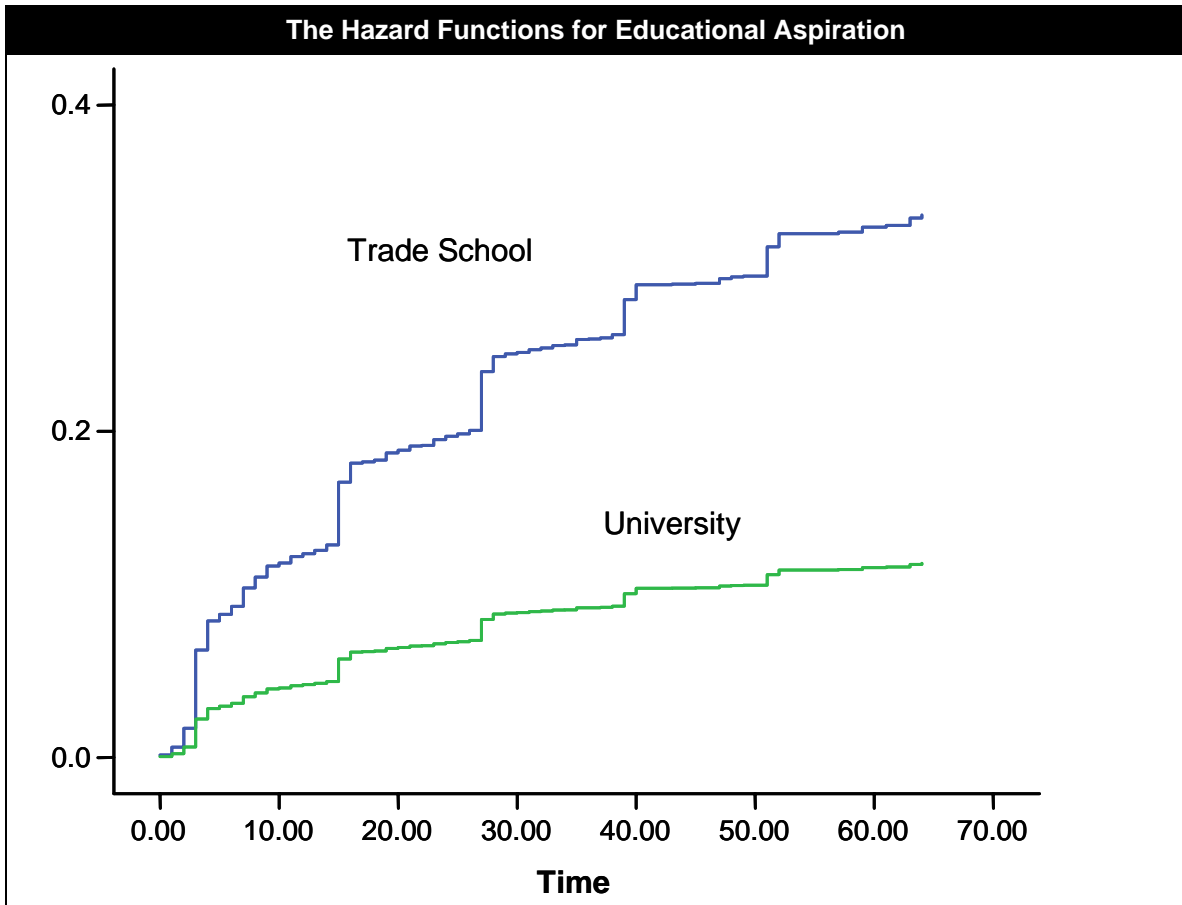
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
12. Felt just a number to this institution	0.03	0.20	-0.19	-0.06	.05	-.11	-.15	.03	.05	-.14	.19	1.00					
13. Social assistance	-0.07	-0.09	0.06	0.18	-0.00	0.05	-0.01	-0.03	-0.02	-0.03	0.05	-0.01	1.00				
14. Scholarship	-0.05	0.21	-0.18	-0.07	-0.06	0.05	0.05	0.00	0.02	0.03	-0.06	0.04	-0.03	1.00			
15. Parent loan	-0.02	0.15	-0.12	-0.05	0.03	-0.04	-0.01	0.03	0.04	0.03	-0.03	0.05	-0.07	0.06	1.00		
16. Single	0.09	0.10	-0.08	-0.09	-0.02	-0.05	-0.03	0.03	0.03	0.02	0.03	0.05	-0.09	0.03	0.05	1.00	
17. University program	-0.06	0.53	-0.47	-0.13	-0.06	-0.11	-0.09	0.04	0.17	-0.01	-0.02	0.31	-0.07	0.33	0.11	0.08	1.00

Appendix D-1

The Hazard Functions for Gender

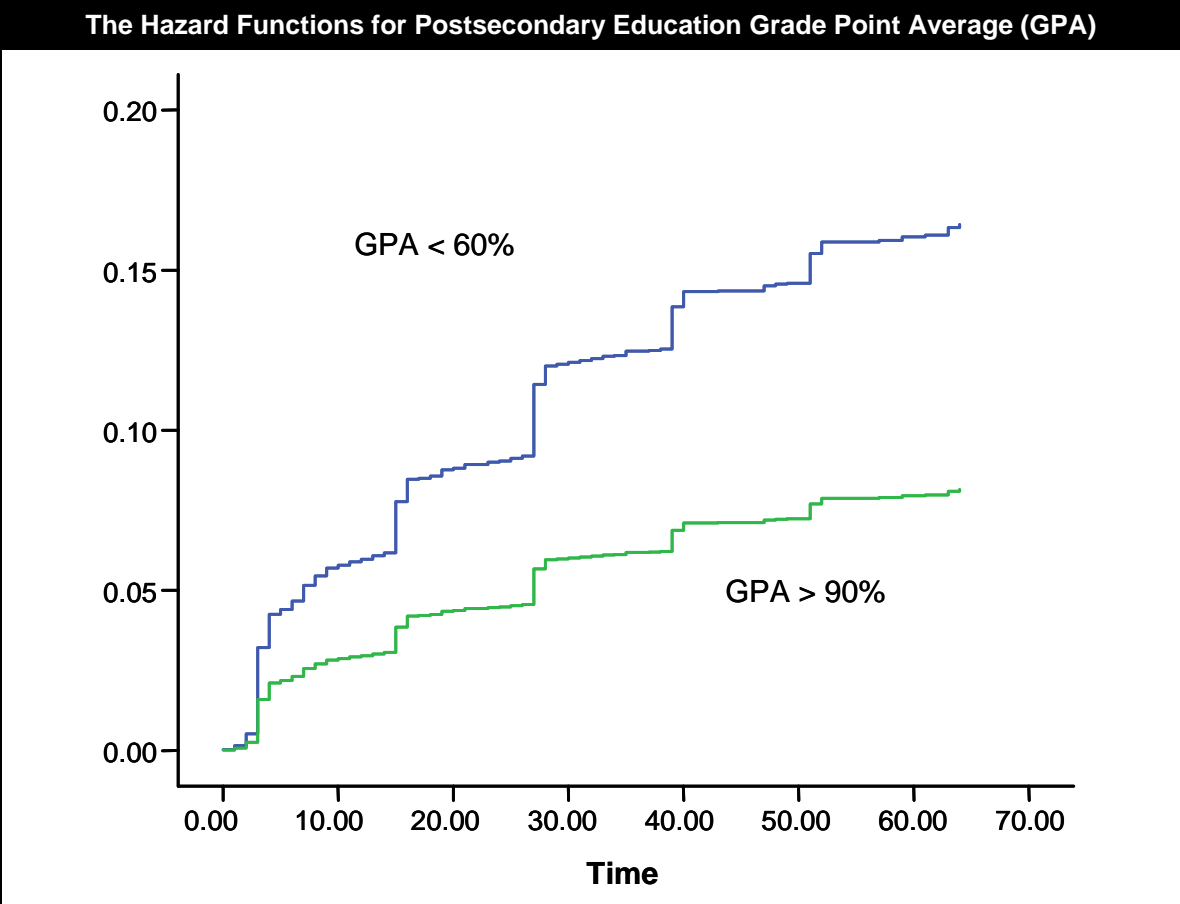


Appendix D-2 The Hazard Functions for Educational Aspiration



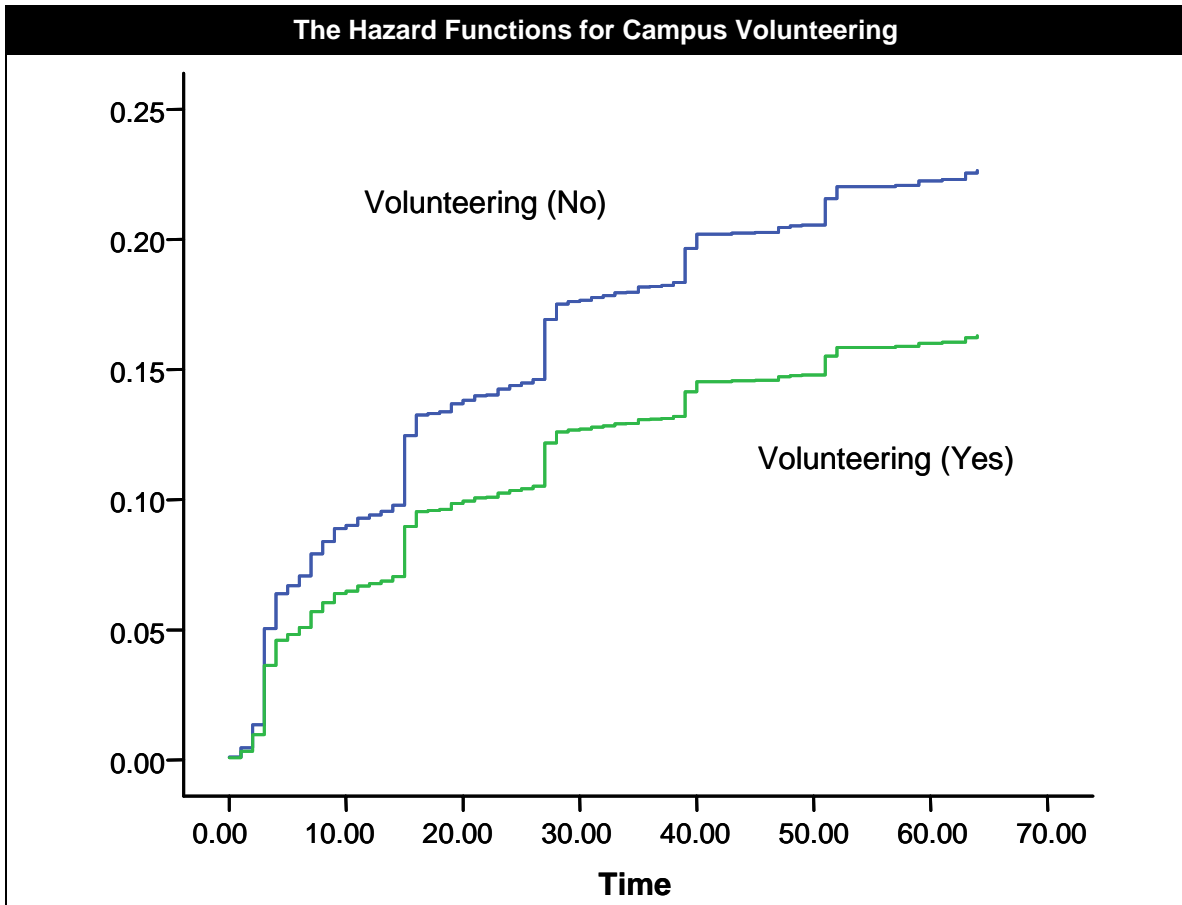
Appendix D-3

The Hazard Functions for Postsecondary Education Grade Point Average (GPA)

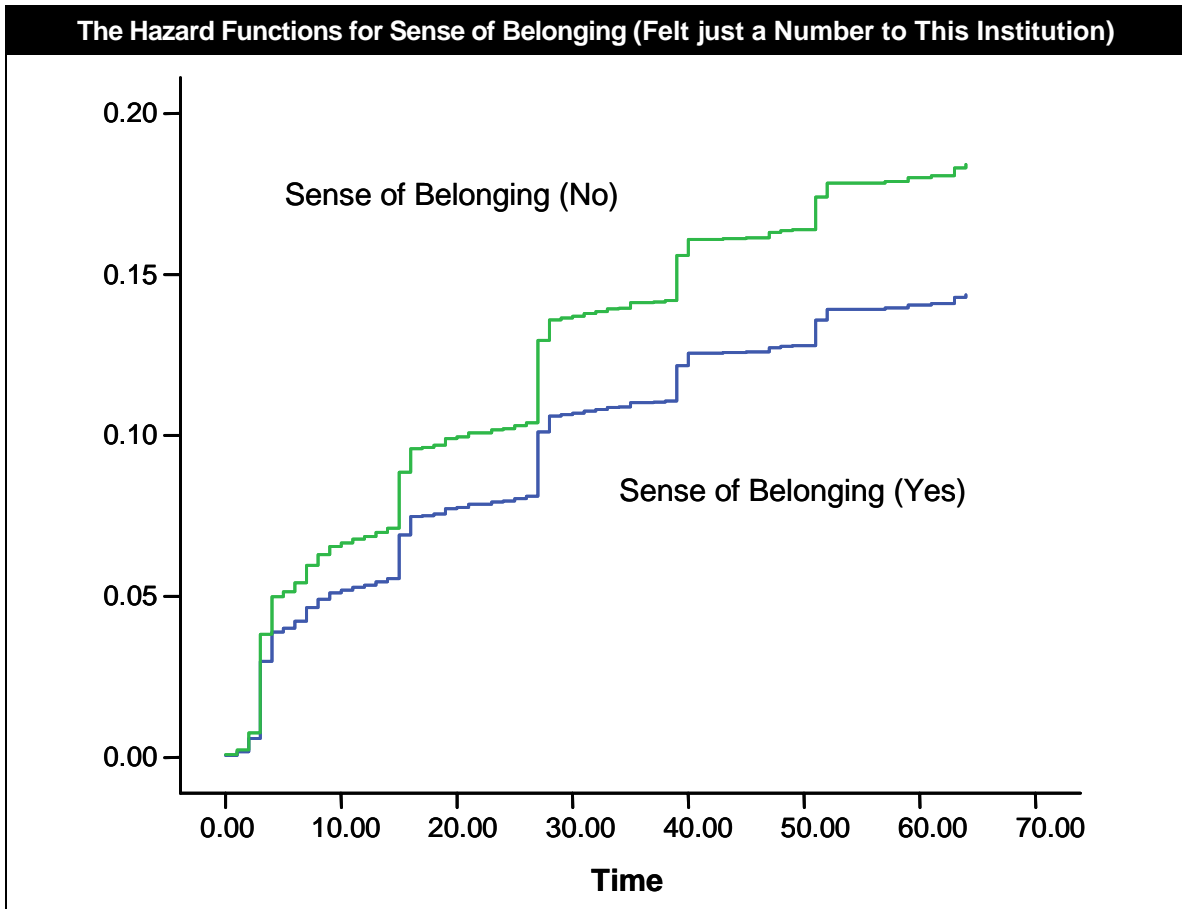


Appendix D-4

The Hazard Functions for Campus Volunteering



*Appendix D-5
The Hazard Functions for Sense
of Belonging
(Felt just a Number to This Institution)*



Appendix D-6

The Hazard Functions for Social Assistance

