How well does the Theory of Planned Behavior predict graduation among college and university students with disabilities?

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Abstract The goal of this research was to develop a model to predict which students with disabilities will drop out before graduation and to investigate the drop out pattern of students with disabilities. To accomplish this we evaluated potential predictors of persistence and drop-out among 611 college and university students with various disabilities and developed a prediction model. We tested this model in a retrospective study using an independent sample of actual graduates ($n = 133$) and premature leavers ($n = 39$). Results show that the best predictors of academic persistence and drop-out are the three Theory of Planned Behavior scales. These predicted 25 % of the variance in intention to graduate and correctly classified 83 % o f participants who were no longer in school (86 % of graduates and 74 % of premature leavers). Path analysis showed linkages between demographic, academic per-

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formance, personality, self-efficacy, and college experience measures and the three
Theory of Planned Behavior predictors. Key reasons for dropping out were: disability,
health, finances, career direction uncertainty, inadequate disability accommodations,
and lack of interest/motivation. A one-page questionnaire based on the Theory of
Planned Behavior (i.e., Attitude, Subjective Norms, Perceived Behavioral Control)
can add to the literature on predictors of intention to graduate, graduation and drop-
out among college and university students with disabilities; this is enclosed in the
"Appendix".

Keywords Academic persistence · Graduation · Postsecondary students
with disabilities · College · University · Drop-out

1 Introduction

The numbers of junior/community college and university students with various dis-
abilities (e.g., visual, hearing, learning) constitute a substantial proportion of post-
secondary enrollments in North America. For example, a large scale American study
showed that 11 % of undergraduates had a disability (Snyder and Dillow 2012). Data
from Canada's largest province show that as many as 14 % of junior/community
college students have a disability (Ministry of Training, Colleges & Universities
2012).

Students with disabilities must overcome unique barriers to pursue postsecondary
education. Many need both human and technological accommodations, such as note
takers and adaptive information and communication technologies (Fichten et al. 2012a;
Lang et al. 2014). Questions about postsecondary education for students with dis-
abilities abound. Some wonder whether the investment of resources for postsec-
ondary education for these students is worthwhile. "Does the extra cost produce
results?"

Findings related to the academic success of students with disabilities are inconsis-
tent. There are several conceptual and methodological reasons for this. First, academic
success is sometimes defined in terms of grades and other times in terms of graduation.
Second, both have multiple definitions and means of measurement. Of course grades
are an important aspect of academic success. Graduation—obtaining a credential—
however, is especially important for life outcomes, such as obtaining employment
(Achterberg et al. 2009; Lindsay 2011). For example some research shows that stu-
dents with and without disabilities have similar grades (e.g., Jorgensen et al. 2005;

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Wessel et al. 2009), while other investigations found that students with disabilities had lower GPAs (Adams and Proctor 2010; Jorgensen et al. 2009a).

When it comes to graduation, some investigations use actual graduation (e.g., Achola 2013; Barber 2012; Unger et al. 2000), others use persistence (i.e., students are enrolled a year or a semester after testing—e.g., Boutin 2008; Mamiseishvili and Koch 2011), "quality of degree" (i.e., various types of honors degrees—Richardson 2009), or a mixture of "positive outcomes" including graduation or persistence in a junior/community college or a transfer to a 4 year university (Jameson 2007). Other investigations use "graduating in prescribed time" (i.e., the time prescribed for the program of study—e.g., Jorgensen et al. 2005) while others evaluate graduation two, five or even 10 years after "prescribed time." Several longitudinal studies suggest that persistence rates of students with and without disabilities are similar when the possibility of longer times to graduate are taken into account (Jorgensen et al. 2009b, 2005; O'Neill et al. 2012; Wessel et al. 2009), although others have indicated that this is not the case (Getzel and Thoma 2008; Lombardi et al. 2012). Thus, definitive information about whether students with and without disabilities differ on grades or graduation is not available.

In addition, in spite of a vast literature on needs and concerns of students with disabilities, we know little about which students will persist and which will give up. The variables which seem to work relatively well in predicting grade point average, such as pre-entry characteristics (e.g., high school grades, scholastic aptitudes test results, parental education) and academic in-college variables (e.g., study habits, student satisfaction) (see reviews by Metz 2006; Hudy 2007) generally work relatively poorly in predicting persistence (Achola 2013; DaDeppo 2009; Jorgensen et al. 2009b).

Student retention and drop-out have important consequences for both society and the students, as dropping out can result in diminished access to employment and earning potential (Fassinger 2008; Metz 2006). Drop-outs also have a major impact on the finances of colleges and universities (Pascarella and Terenzini 2005).

Graduation of students without any disabilities has recently been reported to be as low as 29 % in 2-year American junior/community colleges (by the end of 3 years) and 40 % in public universities (by the end of 5 years), with approximately half of drop-outs occurring in the first year and half (ACT 2006). Nevertheless, it should be noted that a report from Statistics Canada concluded that, "The research shows that while about 50 % of all students failed to finish their initial programs of study within 5 years, only about 10 to 15 % can be considered true drop-outs. Many switched programs, either within a given institution or between institutions (sometimes even moving to a different level of study—e.g., switching from college to university or vice versa). Among those who left at some point, 40 % of college students and 54 % of university students returned to postsecondary studies within 3 years" (Finnie et al. 2010).

2 Education models

Theoretical frameworks for predicting student retention have largely been influenced by Tinto's Student Integration Model (Tinto 1993), and Bean's (1982) Student Attri-

tion Model. In Tinto's model, pre-entry characteristics (e.g., family, socio-economic status, high school performance), initial goals and commitments, academic and social integration, and goals and commitments resulting from experience within the institution are seen as identifiers for students at risk of drop-out. Working from a different theoretical base, Bean (1982) proposed a model that included external variables such as behavioral indicators, particularly student contact with faculty (measure of student interaction) and time spent away from campus (measure of lack of involvement). Student engagement also seems to be important (Kuh 2007). Both models have empirical support (Metz 2006). Attempts to integrate these models have found them to be complementary (Attewell et al. 2011). For example, Metz's (2006) review of traditional measures of retention among students without disabilities indicates that achievement and ability, family background (e.g., level of parental education), and student demographics (e.g., full vs. part-time, age, sex, ethnicity, financial need) are all important for retention. Both Metz' (2006) and Hudy's (2007) literature reviews also show that personality and psychosocial adjustment, social support, perceived institutional climate, and academic self-efficacy all have empirical support. Self-efficacy seems especially important (Chemers et al. 2001). Nevertheless, some variables are applicable only to certain groups and others show inconsistent results. Thus, education models have only limited ability to predict graduation among students with disabilities.

3 Psychological models

A different approach toward investigation of graduation has been evident in psychological models. Psychological models of persistence have included expectancy-value formulations and combinations of motivation and skills constructs (Pintrich 2000). For example, Eccles and Wigfield (2002) link academic persistence to the individuals' expectancy and task-value related beliefs. They define expectations in terms of self-efficacy beliefs and task-values in terms of intrinsic and extrinsic goals, relative costs (obstacles, effort), and attainment value (importance of doing well). Their model contains numerous linked constructs, including variables such as attitudes and expectations, which are key in Ajzen's (2002, 2012) Theory of Planned Behavior as well. Because of its success in predicting behavioral intention and actual behavior in many realms, we selected the constructs of the Theory of Planned Behavior (Ajzen 2012) for evaluation in this investigation.

3.1 Theory of Planned Behavior

A well-known social psychological model of behavior, Ajzen's (2002, 2012) Theory of Planned Behavior proposes that behavior is influenced by intention to carry out the behavior (Behavioral Intention). According to the theory, the criterion variable Behavior (in our case graduation) is related to Behavioral Intention (in our case intention to graduate). Behavioral Intention, according to Ajzen, is predicted by the following three predictors: Attitude, Subjective Norms, and Perceived Behavioral Control. An enormous variety of studies during the past 30 years have used the Theory of Planned

Behavior to understand and modify behavior. For example, Ajzen's own web page lists well over 100 books and journal articles on this topic authored or co-authored by him http://people.umass.edu/aizen/publications.html. We were interested in adding Theory of Planned Behavior constructs to education model predictors of graduation because of its exceptional ability in being able to predict behavior and behavioral intention. The examples below illustrate how this theoretical formulation is relevant to graduation.

Attitude is a positive or negative evaluation of behavior (graduation). For example, if a student's attitude toward graduation is positive, he or she is more likely to intend to graduate.

Subjective Norms refer to perceived social/peer pressure from individuals important in the student's life. The theory proposes that beliefs about the favorability of others' views about graduation are likely to influence a student's intention to graduate.

Perceived Behavioral Control represents perceptions of the ease or difficulty of enacting the behavior and is related to both self-efficacy beliefs and perceived controllability. The greater the Perceived Behavioral Control, the more likely the individual is to carry out the behavior (i.e., the stronger the student's belief about his or her ability to overcome obstacles to graduation, the more likely he or she is likely to intend to graduate).

A meta-analysis shows that the model can explain as much as 39 % of the variance in Behavioral Intention and 27 % in Behavior (Armitage and Conner 2001). We found some investigations using the Theory of Planned Behavior in disability and rehabilitation related areas (Brouwer 2009; Fraser et al. 2011; Hergenrather et al. 2011), although none examined academic persistence and drop-out. It was, therefore, timely to bring this theoretical formulation into the postsecondary education realm.

4 Persistence and drop-out among postsecondary students with disabilities

The literature suggests unique predictors of persistence and drop-out for this group (Koch et al. 2014; Mamiseishvili and Koch 2011; Getzel and Thoma 2008). For example, needed academic supports are not always available (e.g., Christ and Stodden 2005; Tagayuna et al. 2005). Availability of accommodations is variable and dependent on the student's impairment (e.g., poor accessibility of e-learning for students who are blind, problematic campus access for wheelchair users, difficulties with time off for students with medical or mental health impairments, and unsupportive peer attitudes). Students with disabilities may need to devote disproportionate amounts of time, energy and other resources during the academic year (Michallet et al. 2004). Faculty attitudes can also be problematic (Bissonnette 2006; Hindes and Mather 2007; Baker et al. 2012). In addition, students with disabilities must surmount unique obstacles, such as negotiating with faculty about academic accommodations (Cullen and Shaw 1996).

Studies of graduation rates of students with disabilities vary dramatically. For example, Mamiseishvili and Koch (2012) showed that almost 51 % of students with disabilities in 2-year institutions had left their studies by the end of their third year. On

the other hand, O'Neill et al. (2012) found that of those no longer enrolled, 74 % of university students with disabilities had graduated. Discrepancies in findings can be due to a variety of factors, including the level of studies (e.g., junior/community college vs. university) and length of follow-up. Although the literature is inconsistent, several longitudinal studies suggest that persistence rates for students with and without disabilities are similar when the possibility of longer time to graduate is taken into account and, as is the case for students without disabilities, males have a higher attrition rate than females (Jorgensen et al. 2009b; O'Neill et al. 2012; Wessel et al. 2009). An archival investigation of junior/community college students showed virtually identical graduation rates over 12 years for the 653 students with various disabilities and the 41,357 students without disabilities studied: these varied between 55 and 52 %, depending on the program of studies, but with the graduation rates of students with disabilities always slightly, although not significantly, greater than those of students without disabilities (Jorgensen et al. 2005).

5 The present study

The objective of the present investigation was to develop a model, using a concurrent design, to predict which students with disabilities would drop-out before graduation and to investigate the drop-out pattern of students with disabilities. To develop and test a model of persistence and drop-out, we used an online questionnaire consisting primarily of closed-ended measures which assess most of the constructs cited in the literature.

We developed the model using Intention to Graduate as the predicted variable in a sample of current college and university students with various disabilities (Sample 1). Predictor variables include the three components of the Theory of Planned Behavior (i.e., Attitude, Perceived Behavioral Control, Subjective Norms) as well as demographic and school related aspects as well as personality and academic experiences. To ascertain how well the model predicts actual graduation and drop-out we evaluated the prediction model retrospectively in an independent sample of individuals who had left college or university during the past two and a half years and were not currently enrolled (Sample 2).

5.1 Hypotheses

(1) We hypothesized that the three Theory of Planned Behavior predictors (i.e., more positive Attitude, greater Perceived Behavioral Control, more favorable Subjective Norms), which have worked so well in other contexts (Ajzen 2002, 2012), would also be related to academic persistence (i.e., intention to graduate for current students and actual degree/diploma completion for individuals no longer in school). (2) We also predicted that aspects such as personal and academic facilitators, strong academic self-efficacy, good social skills, an even temperament, higher academic performance, fewer disabilities/impairments, higher parental education, lower alienation on campus, and a good sense of connectedness with faculty and students are likely to be related

to persistence. (3) In addition, we expected that the largest number of students would drop-out during the early stages of their studies, as is typically found among students without disabilities (ACT 2006).

6 Method

6.1 Participants

6.1.1 Sample 1

A convenience sample of 611 Canadian postsecondary students with various disabilities who were enrolled in a certificate, diploma or degree program were participants (415 females, 194 males, 2 did not indicate). Of these, 65 % attended a university and 35 % a junior/community college. Participants attended school in 9 of Canada's 10 provinces. Mean age of participants was 29 (SD = 9, median = 25, range = 19–66). There was no significant difference in age between male and female students, although university students (M = 31, SD = 10) were significantly older than junior/community college students (M = 25, SD = 8), $t(603)$ = 7.53, $p < .001$. Participants were enrolled in 98 different Canadian universities and junior/community colleges. Forty-four percent of students had two or more disability/impairments. Students' self-reported disabilities are presented in Table 1.

Table 1 Median age and disabilities of students reporting each disability/impairment (Sample 1)

Type of disability/impairment	Number	Percent	Age
Psychological/psychiatric disability	189	19	26
Learning disability (LD)	181	18	24
Attention deficit hyperactivity disorder (ADHD)	174	17	24
Chronic medical/health problem	113	11	29
Limitation in the use of hands/arms	58	6	29
Hearing impairment	56	6	26
Low vision	49	5	27
Mobility impairment: use of a cane/crutches/walkers	44	4	32
Neurological impairment	43	4	26
Mobility impairment: wheelchair/scooter user	38	4	27
Speech/communication impairment	24	2	26
Totally blind	17	2	30
Pervasive developmental disorder (e.g. Asperger's)	15	1	23
Deaf	12	1	28
Total disabilities/impairments	1,013	–	25

611 students reported a total of 1,013 disabilities/impairments. Participants could check all disabilities that applied. 44 % of students had two or more disabilities/impairments

Table 1 shows that the most common disability/impairment of students was a psychological/psychiatric disability, followed by a learning disability, Attention Deficit Hyperactivity Disorder (ADHD), and a chronic medical/health problem. Almost half of the participants had two disabilities/impairments or more, with learning disability plus ADHD being most common, followed by ADHD plus another psychological disability, chronic health problems plus psychological disability, and mobility impairment plus limitation in the use of hands/arms. It should be noted that psychological/psychiatric disability was most often coupled with another disability/impairment, and was reported by only 9% of participants when this was the sole reported disability. Learning disability was reported as the sole disability by 12% of participants. Nevertheless, psychological/psychiatric disability and learning disability were the most common disabilities reported by students, regardless of how percentages were calculated.

About half of the sample ($n = 309$) did not work during the academic year. The 302 who did so worked an average of 17 h per week (range $= 1$–40 h, $SD = 11$). Most participants (83%) were full-time students, almost half (47%) were pursuing a Bachelor's degree at a university, and 32% were pursuing a junior/community college diploma/associate's degree. The rest were enrolled in certificate or graduate programs. Eighty-seven percent were registered with their school for disability related services and 84% were enrolled in their first choice program.

6.1.2 Sample 2

Participants consisted of a convenience sample of 133 recent (past 21/2 years) Canadian postsecondary graduates (79 females, 54 males) and 39 individuals who had dropped out (25 females, 14 males) during the 21/2 years before entering the study. Of these, 130 individuals last attended a university and 40 a junior/community college (2 did not specify). As in Sample 1, the rest had been enrolled in certificate and graduate programs. The 133 Graduates had been enrolled in 60 different Canadian universities and junior/community colleges and the 39 individuals who had dropped out (Premature Leavers) had been enrolled in 30 different schools. There was no significant difference in age between Graduates and Premature Leavers (mean for the groups combined $= 31$, $SD = 11$, range $= 18$–59, median $= 27$) or between males and females. As was the case for Sample 1, most participants were pursuing a Bachelor's degree at a university (55%), had registered for disability related services (87%), and had been enrolled in their first choice program (89%). There were no significant differences between Graduates and Premature Leavers on these variables. However, Premature Leavers were significantly more likely to have been part-time students (34%) than Graduates (16%), $X^2(1,172) = 5.85$, $p < .05$.

Fifty-two graduates (39%) and 24 Premature Leavers (61%) had two or more disabilities/impairments. Graduates' disabilities are presented in Table 2. This shows that both groups were most likely to have a learning disability or a psychological/psychiatric disability.

Table 2 Median age and disabilities of graduates and premature leavers

Type of disability/impairment	Graduates			Premature leavers		
	Number	Percent	Age	Number	Percent	Age
Learning disability (LD)	39	29	27	13	33	27
Psychological/psychiatric disability	35	26	25	21	54	36
Chronic medical/health problem	27	20	27	8	21	34
Low vision	21	16	27	6	15	24
Attention deficit hyperactivity disorder (ADHD)	21	16	24	7	18	34
Mobility impairment: wheelchair/scooter user	14	11	25	2	5	48
Hearing impairment	13	10	30	4	10	35
Limitation in the use of hands/arms	13	10	23	4	10	43
Mobility impairment: use of a cane/crutches/walkers	9	7	40	4	10	50
Neurological impairment	6	5	26	3	8	36
Speech/communication impairment	4	3	32	1	3	–
Deaf	3	2	24	0	0	–
Totally blind	2	2	25	2	5	24
Pervasive developmental disorder (e.g. Asperger's)	1	1	31	3	8	24
Total disabilities/impairments	208		26	78		29

133 graduates reported a total of 208 disabilities/impairments. 39 premature leavers reported a total of 78 disabilities

6.2 Measures

To evaluate test–retest reliability all measures were administered twice to both samples, with a 5 week interval (range 3–16 weeks, mean and median = 5). Three hundred and twenty-four participants completed the re-test. Results for all measures are included in the descriptions below.

6.2.1 Demographic questions

These include closed-ended questions related to: gender, age, and parental education. We also provided a list of 14 disabilities/impairments (see Table 1) and asked participants to self-identify as many as applied. We separated psychological/psychiatric disability from learning disability and from ADHD because these latter two are typically treated as separate entities in the literature due to their impact on academic work.

6.2.2 School related questions

Closed-ended questions asked about full or part-time status, registration for campus disability related services, qualifications/credentials pursued or abandoned (e.g.,

Bachelor's degree, college diploma), type of institution (junior/community college or university), whether the participant was/had been enrolled in their first choice program, whether their program included an internship, the number of hours they worked during the academic year while studying, whether they had taken a leave of absence, the percentage of their program that they had completed, and whether they knew others with the same disability as their own who successfully completed or dropped out of a similar program. We also asked Premature Leavers to indicate why they dropped out by checking as many reasons as applied to them on a list of 18 possible reasons; these were adapted from Jorgensen et al. (2009b) and Statistics Canada (2003, 2008). These questions have been used in previous studies (Fichten et al. 2010a, 2009).

6.2.3 Academic performance

We asked all participants two questions about their academic performance: one asked respondents to describe themselves as: an A, B, C, or a D or less student. The other asked participants to rank themselves against the rest of the students in their program of study: in the top, middle, or bottom third (modified from Statistics Canada, 2008). For both questions, participants could answer, "I don't know." Since the correlation between scores was high, $r(665) = .72$, $p < .001$), and because more participants answered, "I don't know" to the ranking question we only used the A, B, C, or D question in data analyses. Test–retest reliability for 312 participants was .83, $p < .001$.

6.2.4 College Experience Questionnaire (CEQ) (*Fichten et al. 2006, 2010b*)

This measure uses a 6-point Likert-type scale (1 = Much Harder, 6 = Much Easier) and inquires about aspects which can facilitate or act as barriers to academic success. It has three subscales which evaluate whether rated aspects made the participant's postsecondary studies harder or easier. Here we used two subscales: Personal Situation (9 items—e.g., study habits, financial situation) and School Environment (14 items—e.g., level of difficulty of courses, availability of computers on campus). The third subscale (Government and Community Supports and Services) was not used because it deals with specific services that are not applicable to all students. Good psychometric properties were reported by the CEQ's authors. In the present sample Cronbach's alpha for 323 participants was .76 and test–retest reliability was .73, $p < .001$, for the Personal subscale and .84 and .70, $p < .001$, respectively, for the School Environment subscale. Scores have also been shown to be related to the quality of academic supports that students with learning disabilities and ADHD report receiving (Wolforth and Roberts 2009). In addition, scores on both subscales were related to academic satisfaction of students both with and without disabilities and the Personal subscale was related to academic retention of junior/community students with disabilities (Jorgensen et al. 2011). Higher scores indicate facilitating conditions (i.e., made academic life easier), and lower scores indicate barriers (i.e., made academic life harder).

6.2.5 Theory of Planned Behavior (Ajzen 2002, 2012)

Traditional predictors of the criterion variable (Behavior/Behavioral Intention) are measures of Attitude, Subjective Norms, and Perceived Behavioral Control. Because there were no suitable measures related to postsecondary education, scales were adapted from Davis et al. (2002); these modified scales are available in the "Appendix". Six-point Likert scale ratings (Strongly Disagree to Strongly Agree) were used to evaluate Behavioral Intention (5 items—e.g., All things considered, it is possible that I might not complete my program of study), Perceived Behavioral Control (4 items—e.g., It is mostly up to me whether or not I complete my program of study), and Subjective Norms (3 items—e.g., Most people who are important to me think that I should complete my program of study). The Attitude scale (8 items) evaluates attitude toward completing one's program on 6-point semantic differential scale ranging from –3 to +3 (e.g., very rewarding to very punishing). Scoring is the mean of each scale (for ease of scoring we added 3 to the Attitude scale to eliminate negative numbers); thus the range of scores on all scales is 1 to 6. A Total score for the three predictor variables is calculated by summing Attitude, Subjective Norms, and Perceived Behavioral Control mean scores (range = 3–18). In the present study Cronbach's alpha for 322 participants was .83 and test–retest reliability was .67, $p < .001$, for Total score; Cronbach's alpha was .71 and test–retest reliability was .75, $p < .001$, for Perceived Behavioral Control: Cronbach's alpha was .74 and test–retest reliability was .62, $p < .001$, for Subjective Norms; and Cronbach's alpha was .78 and test–retest reliability was .74, $p > .001$, for Attitude). Higher scores indicate more favorable views about graduating.

Behavioral Intention scale items are as follows: I intent to complete my program of study; I will try to complete my program of study; I expect to complete my program of study; I am determined to complete my program of study; All things considered, it is possible that I might not complete my program of study. Cronbach's alpha for 325 participants was .79 and test–retest reliability was .75, $p < .001$. Higher scores indicate greater likelihood of graduating.

6.2.6 Self-Efficacy Questionnaire (Solberg et al. 1998)

This measures, on a 10-point scale (0–9), how confident respondents are that they could successfully enact various behaviors. We used two subscales: Course Self-Efficacy (7 items—e.g., take good class notes) and Social Self-Efficacy (6 items—e.g., talk to your professors/instructors). In the present study Cronbach's alpha for 324 participants was .81 and test–retest reliability was .89, $p < .001$, for Course Self-Efficacy and .84 and .89, $p < .001$, respectively for Social Self-Efficacy. Higher scores indicate stronger self-efficacy beliefs.

6.2.7 Campus Climate—Social Alienation (Wiseman et al. 1988)

Only the 4-item Social Alienation Subscale of this 6-point Likert scaled measure (Strongly Disagree—Strongly Agree) was used (e.g., I find myself lonely and lost on

this campus). In the present study Cronbach's alpha for 323 participants was .73 and test–retest reliability was .59, $p < .001$). Higher scores indicate greater alienation.

6.2.8 Eysenck Personality Questionnaire Revised-Abbreviated (EPQR-A) (*Francis et al. 1992*)

Only the Neuroticism (6 items—e.g., Are you a worrier?) and Extraversion subscales (6 items—e.g., Are you mostly quiet when you are with other people?) of this well-known forced choice questionnaire were used. In the present sample Cronbach's alpha for 324 participants was .73 and test–retest reliability was .83, $p < .001$, for Neuroticism and .81 and .88, $p < .001$, respectively, for Extraversion. Lower scores indicate greater Extraversion and greater Neuroticism.

6.3 Procedure

In the spring 2010 semester we sent invitations to all current and former postsecondary students with disabilities who had participated in our previous research and who indicated that we may contact them for future studies. We also emailed announcements to discussion lists focusing on Canadian postsecondary education and to project partners (mainly student and campus disability service provider groups). The announcement indicated that we were seeking college and university students currently enrolled in a program (i.e., diploma, certificate or degree program) as well as recent (past 21/2 years) graduates and individuals who had dropped out prior to completing their program. Individuals aged 18 or over were sought to help identify environmental, financial, personal and other factors that facilitate or pose barriers to students with disabilities pursuing a junior/community college or university education in Canada. Based on pre-testing we indicated that it would take approximately 20 min to complete the online questionnaire and that we were offering a $20 honorarium.

Individuals who indicated their interest were directed to a website where they read the information and consent form approved by Dawson College's Human Research Ethics Committee. Participants clicked on the "Continue" button to signal their agreement. This brought them to the accessible online questionnaire. Participants selected their category [current student, recent graduate, recent premature leaver (dropped out)] and answered questions. The same questions were asked of all groups of participants with the following exceptions: grammatical changes were made to reflect current or past studies, and only participants who had dropped out were asked about reasons for this. The final screen requested permission to contact the individual for future studies and invited them to provide contact information for the honorarium. Virtually all participants provided this information.

Four weeks later, those who indicated that we may contact them for future studies were e-mailed and asked to complete the same questionnaire again (to allow calculation of test–retest reliability). Three hundred and thirty-four individuals completed the re-test. They were informed that doing so would qualify them for a draw for one of five $100 gift certificates from Chapters/Indigo Books & Music. Prior to data analysis the

Table 3 Students: summary for stepwise regression for behavioral intention to graduate

Variable	R square	Beta	Δ F	p
Theory of Planned Behavior: Perceived Behavioural Control	0.167	0.29	94.546	<.001
Theory of Planned Behavior: Attitude	0.215	0.18	28.732	<.001
Theory of Planned Behavior: Subjective Norms	0.250	0.14	22.123	<.001
EPQR-A: Neuroticism	0.261	0.04	6.900	<.01
Academic Performance[a]	0.269	−0.09	5.133	<.05

[a]Lower is better

data set was thoroughly scrutinized to ensure the integrity of responses (cf. Prince et al. 2012).

7 Results

7.1 Sample 1: Students

To predict Behavioral Intention to Graduate we entered all 26 potential predictor variables into a stepwise linear regression equation. Results in Table 3 indicate that the first three variables to enter were the three Theory of Planned Behavior measures, with Perceived Behavioral Control, Attitude, and Subjective Norms all adding significantly to the prediction. These variables were significant, $F(3, 473) = 52.25$, $p < .001$, and together accounted for 25 % of the variance in Behavioral Intention to Graduate. Although two other variables (i.e., lower EPQR-A Neuroticism, and higher Academic Performance) also added at $p < .05$, Table 3 shows that these only added negligibly to the prediction. All other variables entered in the equation did not add significantly to the regression for Behavioral Intention to Graduate.

Due to shared variance, several variables of interest that were correlated with the Theory of Planned Behavior predictor variables did not add significantly to the model. Correlations with the predictor variables are presented in Table 4. Only coefficients significant at the .001 level remained significant after a Bonferroni correction to the alpha level was made. Table 4 shows that more positive Attitude as well as greater Perceived Behavioral Control were significantly related to: fewer Disabilities, more facilitating CEQ Personal and School experiences, greater Course and Social Self-Efficacy, lower Campus Climate—Social Alienation, and higher EPQR-A Extraversion and lower Neuroticism. More positive Attitude was also related to better Academic Performance. Greater Perceived Behavioral Control was also related to being Younger and to being enrolled in a College rather than a University. The pattern of variables significantly related to Subjective Norms was quite different: greater Parental Education, being Enrolled Full-Time, not having been on a Leave of Absence, younger Age, and lower Campus Climate—Social Alienation were related to Subjective Norms. It is noteworthy that the following variables were not related to any Theory of Planned Behavior predictor variables: Gender, Registration for Disability Related Services, being enrolled in one's First Choice Program, the Percent of Program Completed, whether one's program of studies included an Internship, the number of hours worked

Table 4 Students: correlations with Theory of Planned Behavior predictors

Variable	Attitude	Perceived Behavioral Control	Subjective Norms
Demographics			
Number of disabilities[a]	**−.150*****	**−.170*****	−.098*
Age	.035	**−.252*****	**−.269*****
Gender (1 = female, 2 = male)	−.065	.045	.005
Parental education			
Years of education of father	−.021	.103*	**.147*****
Years of education of mother	−.019	.055	**.178*****
School related aspects			
Full or part-time student (1 = full-time, 2 = part-time)	.017	−.078	**−.155*****
Registration for disability related services (1 = yes, 2 = no)	.031	−.048	−.052
First choice of program (1 = yes, 2 = no)	−.090*	−.074	−.058
Percent of program completed	−.038	.002	.062
Leave of absence (1 = yes, 2 = no)	.033	.110**	**.141*****
Internship (1 = yes, 2 = no)	−.085*	.020	.020
Employment hours per week	.019	−.007	.013
Type of institution: college = 1 or university = 2	.019	**−.137*****	−.071
Knowing others with same disability/impairment			
Someone who graduated (1 = yes, 2 = no)[a]	−.081*	−.123**	−.124**
Someone who dropped out (1 = yes, 2 = no)	−.004	.080	−.044
Academic performance[a]			
Grade (1 = A, 2 = B, 3 = C, 4 = D or worse)[a]	**−.135*****	−.107**	.023
College Experience Questionnaire (CEQ)			
CEQ—personal situation (higher score = more facilitating)	**.192*****	**.421*****	.081*
CEQ—school environment (higher score = more facilitating)	**.264*****	**.375*****	.100*
Self-efficacy (academic)			
Course self-efficacy	**.273*****	**.399*****	.090*
Social self-efficacy	**.294*****	**.320*****	.091*
Campus climate			
Social alienation (higher score = more alienated)[a]	**−.283*****	**−.435*****	**−.142*****
Eysenck Personality Questionnaire (EPQR-A)			
Extraversion (lower score = more extraverted)	**−.158*****	**−.149*****	.000
Neuroticism (lower score = more neurotic)	**.258*****	**.180*****	−.054

Table 4 continued

Variable	Attitude	Perceived Behavioral Control	Subjective Norms
Theory of Planned Behavior			
Attitude	1	**.337*****	**.151*****
Perceived Behavioral Control	**.337*****	1	**.261*****
Subjective Norms	**.151*****	**261*****	1
Total	**.683*****	**.773*****	**.656*****

Sample sizes range from 524 to 611. r values significant at the .001 level or better are bolded. After a Bonferroni correction to the alpha level, only coefficients significant at the .001 level remain significant
* $p < .05$, ** $p < .01$, *** $p < .001$
[a]Lower score is better, else higher score is better

Table 5 Discriminating graduates and premature leavers: discriminant function predicting graduation and drop-out based on the three Theory of Planned Behavior variables

Sample	Variables	Correlations to the discriminant function
Full sample: Canonical correlation = .54, $p < .001$		
	Theory of Planned Behavior: Perceived Behavioral Control	.899
	Theory of Planned Behavior: Subjective Norms	.640
	Theory of Planned Behavior: Attitude	.339
Females: Canonical correlation = .49, $p < .001$		
	Theory of Planned Behavior: Perceived Behavioral Control	.867
	Theory of Planned Behavior: Subjective Norms	.748
	Theory of Planned Behavior: Attitude	.278
Males: Canonical correlation = .64, $p < .001$		
	Theory of Planned Behavior: Perceived Behavioral Control	.904
	Theory of Planned Behavior: Subjective Norms	.453
	Theory of Planned Behavior: Attitude	.415

per week, or Knowing Someone with the Same Impairment who either Graduated or Dropped Out.

7.2 Sample 2: Graduates and premature leavers

To validate the model derived from the stepwise linear regression analysis on student data (Sample 1) we conducted a stepwise discriminant analysis to predict which individuals actually graduated or dropped out. Entered into the discriminant analysis were the three Theory of Planned Behavior predictor variables.

Results in Tables 5 and 6 show that 83 % of the entire sample was correctly grouped, with 74 % of Premature Leavers and 86 % of Graduates correctly classified. Although the model worked less well for females, with only 81 % correctly classified, when it

Table 6 Discriminating graduates and premature leavers: classification tables based on the three Theory of Planned Behavior variables

	Actual group	Entire sample[a] Predicted group		Females[b] Predicted group		Males[c] Predicted group	
		Graduates	Premature leavers	Graduates	Premature Leavers	Graduates	Premature leavers
Count	Graduates	113	19	67	12	49	4
	Premature leavers	10	28	8	17	1	12
%	Graduates	86	14	85	15	92	8
	Premature leavers	26	74	32	68	8	92

There was insufficient data for 1 male premature leaver

[a] Entire sample: 83 % of original grouped cases correctly classified

[b] Females: 81 % of original grouped cases correctly classified

[c] Males: 92 % of original grouped cases correctly classified

came to males, the results show that 92 % of both Graduates and Premature Leavers were correctly classified.

We also examined additional variables of interest. Graduates, compared to Premature Leavers, were more likely to have been full-time students, $X^2(1, 167) = 6.48$, $p < .05$. After a significant MANOVA on variables of interest from Table 4, $F(16, 131) = 6.59$, $p < .001$, a series of t tests were carried out. It can be seen in Table 7 that Graduates had more favorable scores than those who dropped out prior to obtaining their qualification not only on the three Theory of Planned Behavior Scales, with effect sizes ranging from medium to large, with Total score achieving the largest effect size of 1.34. In addition, Graduates had more Personal CEQ facilitators, stronger Self-Efficacy, and lower Campus Climate—Social Alienation scores. They also had fewer disabilities. There were no significant differences on Parental Education, Age, Academic Performance, CEQ School related facilitators, or EPQR-A scores. Chi square tests show no significant differences on Gender, Registration for Disability Related Services from the school, enrollment in one's First Choice of Program, or Enrollment at a junior/community college versus a university.

To test the expectation that most students drop-out during the early stages of their studies (i.e., that those who had completed a larger proportion of their studies would be less likely to drop-out) we examined the proportion of their studies that Premature Leavers had completed at the point when they dropped out. Results show that approximately 30 % of participants dropped out before completing 1/4 of their program (e.g., first year of a 4-year Bachelor's program), and that an additional 35 % dropped out before they completed 1/2 of their program. Another 17 % dropped out before completing 3/4 of their program of studies and a final 17 % dropped out in the last quarter of their program.

We also asked those who had dropped out about their reasons for leaving. Table 8 shows that the main reasons for dropping out, in rank order of frequency, were: disability, health, financial situation, career direction uncertainty, inadequate disability related accommodations, and lack of interest/motivation.

Table 7 Similarities and differences: graduates and premature leavers

	Graduates			Premature Leavers			Test			
	n	Mean	SD	n	Mean	SD	t	df	Sig. p <	d
Demographics										
Number of disabilities	133	1.56	0.83	39	2.00	1.03	2.73	170	**.01**	**0.47**
Age	125	30.45	10.08	37	33.57	11.99	1.58	160	.116	0.34
Parental education										
Years of education of father	127	12.65	3.89	36	12.74	3.97	0.11	161	.911	0.02
Years of education of mother	130	12.69	3.51	36	13.22	3.27	0.82	164	.410	0.16
Academic performance[a]										
Grade (1 = A, 2 = B, 3 = C, 4 = D or worse)[a]	130	1.72	0.67	37	1.97	0.87	1.921	165	.056	0.32
College Experiences Questionnaire										
CEQ—personal situation (higher score = more facilitating)	131	3.81	1.05	37	3.19	0.88	3.32	166	**.001**	**0.64**
CEQ—school environment (higher score = more facilitating)	131	3.96	1.09	37	3.61	0.93	1.80	166	.100	0.35
Self-efficacy										
Course self-efficacy	131	6.52	1.66	39	5.66	1.98	2.73	168	**.01**	**0.47**
Social self-efficacy	131	6.69	1.87	39	5.57	2.24	3.15	168	**.01**	**0.54**
Campus climate[a]										
Social alienation (higher score = more alienated)[a]	132	3.09	0.80	39	3.53	0.73	3.10	169	**.01**	**0.57**
Eysenck Personality Questionnaire (EPQR-A)										
Extraversion (lower score = more extraverted)	131	8.52	2.02	39	8.85	2.19	0.87	168	.386	0.16
Neuroticism (lower score = more neurotic)	131	8.42	2.00	39	8.08	1.74	0.96	168	.340	0.18
Theory of Planned Behavior										
Perceived Behavioral Control	133	4.44	0.94	39	3.22	1.10	6.89	170	**.001**	**1.20**
Subjective Norms	132	5.25	1.04	39	4.12	1.43	5.47	169	**.001**	**0.90**
Attitude	132	4.79	1.05	38	4.23	1.19	2.82	168	**.01**	**0.50**
Total	132	14.49	2.08	38	11.50	2.35	7.56	168	**.001**	**1.34**

Significant items are bolded

[a] Lower score is better, else higher score is better

7.3 Cut-off scores for students

To establish an easily implemented recommended cut-off for current students using Theory of Planned Behavior Total scores, we performed a series of tests. First we showed that Students' Total scores were significantly related to their Behavioral Intention to graduate scores, $r(604) = .52$, $p < .001$. Next we performed two t tests. One shows that Students who scored at or above the Behavioral Intention to graduate

Table 8 Premature leavers' reasons for leaving school

Reason	Number of responses	% of people	% of responses
Disability	18	47	13
Health reasons	16	42	12
Financial situation	13	34	9
Career direction uncertainty	12	32	9
Accommodations for my disability were inadequate	11	29	8
Lack of interest/motivation	11	29	8
Other	10	26	7
I was asked by my school not to return	6	16	4
Wanted to or needed to work	5	13	4
Wanted to take time off	5	13	4
Grades are not good enough	5	13	4
Program is too difficult	5	13	4
Program takes too long	5	13	4
There was one required course that I just could not complete	4	11	3
Quality of teaching	4	11	3
Program didn't help with my career goals	3	8	2
Other family responsibilities	2	5	1
Had a job	2	5	1
Maternity or parental leave, pregnancy	0	0	0
Total responses	137		

38 people reported a total of 137 reasons for leaving school. One individual did not indicate the reason for leaving school. The average number of reasons premature leavers indicated for dropping out of school was 3.61 (SD = 1.76)

mean (i.e., 5.50) had significantly higher Total scores ($M = 15.12$, $SD = 1.68$, $n = 392$) than those who scored below the mean ($M = 13.41$, $SD = 2.44$, $n = 214$.), $t(604) = 10.84$, $p < .001$. The other shows that the mean Total score of Graduates ($M = 14.49$, $SD = 2.08$) was significantly higher than that of Premature Leavers ($M = 11.50$, $SD = 2.36$), $t(168) = 7.56$, $p < .001$. There was also a significant difference among the Total scores of the three groups of participants, $F(2, 774) = 38.85$, $p < .001$. Tukey post hoc tests show that the Total for Students ($M = 14.51$, $SD = 2.03$) did not differ from those of Graduates ($M = 14.49$, $SD = 2.08$), while both were significantly higher than those of Premature Leavers ($M = 11.50$, $SD = 2.35$). In addition, a classification analysis to predict Graduate and Premature Leaver status using Theory of Planned Behavior Total score as the predictor variable correctly grouped 79% of participants, with 81% of Graduates and 71% of Premature Leavers correctly classified, again suggesting that the Total score is a good indicator of the likelihood of graduation and drop-out.

To establish the most appropriate cut-off for the Theory of Behavior Total score we computed an ROC curve for Students. This shows that a cut-off of 15.15 has a

sensitivity of .669 and a specificity of .690 (i.e., correctly identified 2/3 of those likely to graduate and almost 70 % of those likely to drop-out. The conditional probability of graduation, based on the proposed cut-off, is 65 %.

8 Discussion

8.1 Sample characteristics

Both current students (median age = 25) and those who had left school (median age when they left school = 27) were older than typical samples without disabilities. This is common in studies of students with disabilities, possibly because these students often enter postsecondary studies later (Mamiseishvili and Koch 2012) and stay longer (Jorgensen et al. 2005). For example, the mean age of students in O'Neill et al.'s (2012) recent study was 26 with a range of 17–67. Half of our sample of students worked during the academic year. Those who did so worked for an average of 17 h per week. The most common disabilities/impairments for participants in all groups in the present investigation were a learning disability, a psychological/psychiatric disability, a chronic health impairment, and ADHD. Although psychiatric/psychological disability is not commonly noted in most studies, in the present investigation this was found most often to co-occur with another disability/impairment. Almost half of all samples had two or more disabilities/impairments.

8.2 Predicting students' intention to graduate

The best predictors of the criterion variable "Intention to Graduate" were the three Theory of Planned Behavior Scales, with Perceived Behavioral Control being the most, and Subjective Norms the least important. Attitude was in the middle. Together these three variables predicted 25 % of the variability in students' Intention to Graduate. Two additional variables, lower neuroticism and higher grade also added to the prediction, but their joint contribution added only 2 % to the prediction.

In addition, because of shared variance, several variables of interest that were related to the predictor variables did not add significantly to the prediction model. Since we were also interested in variables found in the literature to be related to postsecondary academic persistence, we examined the relationship between the three Theory of Planned Behavior predictors (i.e., Perceived Behavioral Control, Subjective Norms and Attitude) and the remaining 23 variables in our investigation. We found that many of the variables related to Perceived Behavioral Control were also related to Attitude: these include fewer disabilities, more facilitating personal and school experiences, greater course and social self-efficacy, lower social alienation, higher extraversion and lower neuroticism. When it came to Subjective Norms, the pattern of variables was quite different: being younger, higher parental education, full-time studies, and not having been on a leave of absence.

On the other hand, several variables linked in the literature to academic persistence were unrelated to the predictor variables: gender, registration for disability related services, being enrolled in one's first choice program, the percent of program completed,

whether one's program of studies included an internship, knowing someone with the same impairment who either graduated or dropped out, or the number of hours worked per week. Although in samples of students without disabilities the number of hours that students work during the academic year is also related to graduation (Bozick 2007), this was not the case in the present study, even though approximately half of the sample of students worked during the academic year.

Registration for campus disability related services, usually rated the most important facilitator of academic performance by students with disabilities (Fichten et al. 2006), was similarly unrelated either to intention to graduate or to actual graduation. The literature on the role of registration for disability related services in predicting graduation is inconsistent, with some studies showing that this adds, although slightly, to the ability to predict persistence (O'Neill et al. 2012), while others show that the effect of accommodations is negated when other variables are included (Mamiseishvili and Koch 2011). Such differences may occur, in part, due to a priori differences between students who do and those who do not elect to register for such services. For example, in the present study students least likely to have registered for such services were those with chronic medical/health problems and those who used a cane, walker, or crutches. Another possibility relates to the actual use of disability related services, rather than to mere registration.

It should be noted that students' disabilities/impairments may have differential impact on the likelihood of graduation. The sample sizes in the present investigation precluded analysis of intention to graduate of students with different disabilities. Clearly, further research on students with diverse backgrounds and different disabilities is needed.

Several studies show that the attrition rate of male students is higher than that of females (Jorgensen et al. 2009b; National Center for Education Statistics 2010; Mamiseishvili and Koch 2011, 2012; O'Neill et al. 2012; Wessel et al. 2009). In these investigations graduation and drop-out rates were provided by the school, and were not based on volunteer participants' responses. We believe the failure to find a sex difference in drop-out and graduation may have been due to our methodology, as volunteers often have different profiles from those who do not volunteer for studies (Jorgensen and Fichten 2007; Woosley 2005). Research carried out at different schools is needed where all students complete measures and where graduation and drop-out are based on actual outcomes and, thus, are not affected by volunteer effects.

8.3 Validating the model: predicting actual graduation and drop-out

The goal here was to ascertain how well the variables which predicted intention to graduate predict actual graduation and drop-out. Therefore, in a discriminant analysis we examined how well the three Theory of Planned Behavior Scales predicted academic persistence in an independent sample comprised of former students who either recently graduated ($n = 133$) or dropped out ($n = 39$). The findings show that 83 % of these individuals were correctly classified by the three Theory of Planned Behavior predictors, with 92 % of males who had dropped out being classified correctly. Never-

theless, it should be noted that the sample sizes are small and replication of the results is needed.

As in the case of students, for graduates and premature leavers, too, we examined the hypothesized predictors of persistence. Here, we again found that graduates had more favorable scores than those who dropped out not only on the three Theory of Planned Behavior predictors but also on self-described academic performance, school and personal facilitators, academic self-efficacy, being enrolled on a full-time basis, and campus social alienation. They also had fewer disabilities. There were no significant differences on parental education, age, gender, registration for disability related services from the school, enrollment in one's first choice of program, or enrollment at a junior/community college versus a university. In fact, the only variables that we found to be related to predictors of intention to graduate among students that were unrelated to actual persistence are Neuroticism and Extraversion.

8.4 Using and researching the Theory of Planned Behavior to identify students at risk for dropping out

The one-page measure comprising the three Theory of Planned Behavior Scales, available in the "Appendix", can provide useful data and should be considered for addition to college and university institutional research measures for further study. It is free, takes minutes to complete, and appears to have excellent potential for predicting not only intention to graduate but also actual graduation and drop-out. To establish an easily implemented recommended cut-off for current students we recommend using a Total score of 15.15; this could be used as a tentative cut-off for initiating retention programming. Research using this cutoff in additional studies is needed.

8.5 When do students drop-out?

It has been suggested that students may have more "invested" the closer they are to graduation (Hatcher et al. 1992). This argument implies that students would be less likely to drop-out in their final years. Indeed, an ACT (2006) study showed that almost half of all drop-outs among students without disabilities typically occurred in the early semesters.

In the present investigation, current students' intention to graduate was not significantly related to percent of program completed. As for those who actually dropped out, our results show that about 30 % of individuals quit before completing the first quarter of their program (e.g., during the first year of a 4-year Bachelor's program or the first semester of a 2-year junior/community college program), another 30 % dropped out before completing half of their program, and almost 20 % dropped out in each subsequent quarter. It should be noted, however, that the number of participants who dropped out was relatively small. Nevertheless, such results are consistent with results of a previous study of junior/community college students where it was found that compared to students without disabilities, students with disabilities enrolled in junior/community college dropped out at lower rates between the first and third semesters, but at higher rates in later semesters, resulting in sim-

ilar drop-out and graduation rates at the end of ten semesters (Jorgensen et al. 2009b).

Examination of reasons for dropping out clarifies these results, since the most common reasons given for dropping out were one's health and one's disability, followed by financial concerns, career direction uncertainly, lack of interest/motivation, and inadequate disability related accommodations. Thus, the most common reasons for abandoning one's studies are impairment/disability related. These results are similar to findings of a previous study of junior/community college students (Jorgensen et al. 2009b) which found that a significantly larger proportion of both male and female students with than without disabilities indicated that they abandoned their studies due to disability/personal health issues. Parenthetically, in the Jorgensen et al. study the most important reasons for leaving given by females without disabilities were to attend university and career direction uncertainty/change. For males without disabilities the most frequent reasons were career direction uncertainty/change and dislike of one's academic program.

8.5.1 Limitations

While nine out of 10 Canadian provinces and both college and university sectors are represented, our samples are neither random nor fully representative of the populations studied. Self-selection biases, volunteer effects, the use of e-mail discussion lists as a main form of recruitment, and the small proportion of individuals who had not registered for disability related services pose methodological challenges in this regard. Given the regression analysis in Sample 1, we talk about predicting intention to graduate. It should also be noted that all measures were administered concurrently, and that the best design for evaluating the validity of the prediction model is in a longitudinal design. Such a study is currently ongoing in our laboratory. Moreover, Sample 2 involved retrospective ratings, raising the possibility of confirmatory self-rating bias. In addition, the sample of participants who had dropped out was small.

8.5.2 Future research

Younger age was related to two components of intention to graduate among students, a finding consistent with some studies (Jorgensen et al. 2009b; Mamiseishvili and Koch 2012) but not others (O'Neill et al. 2012). The literature suggests that some students wait before starting postsecondary studies, and it is these students' older age that is related to drop-out (Mamiseishvili and Koch 2011). Clearly the role of age in predicting academic persistence needs further investigation.

Future research should also examine larger samples and evaluate the Theory of Planned Behavior based model to compare persistence, intention to graduate, and drop-out between individuals with and without disabilities. The generalizability of the model for students with different disabilities/impairments also needs further evaluation. In addition, a longitudinal study to explore the link between intention to graduate and actual graduation and drop-out should be carried out. Moreover, studies where volunteer effects have no bearing need to be implemented. Reasons identified in this

study for dropping-out can help identify strategies and best practices that could either manage or largely eliminate these.

9 Recommendations

When it comes to addressing drop-out among students with disabilities, our data suggest that the following characteristics put these students at higher risk of dropping out: lower grades, a leave of absence, having more than one disability/impairment, being older, feeling alienated on campus, personal and school related variables that make academic studies harder, higher neuroticism, lower levels of academic self-efficacy, being introverted, and studying on a part-time basis.

Students with disabilities are often unsure about the value of a college or university education to help them gain jobs. The incorrect, but ubiquitous "70 % of people with disabilities are unemployed" (see Fichten et al. 2012b) can discourage students from continuing their studies (Why bother studying if it just leads to unemployment?), resulting in career direction uncertainty and lack of interest/motivation. To assist students with disabilities secure employment after graduation, campus-based services charged with career discovery/transition, along with internship and other related programs need to be carefully evaluated to ensure that the full range of tools, resources, and opportunities that are available to students without disabilities are accessible to students with different disabilities as well (e.g., online career aptitude tests and job-related resources being accessible to students using adaptive software such as a screen reader).

Given that most premature leavers cited health and disability/impairment related issues for dropping out, more needs to be done by colleges and universities to follow-up with students with disabilities who are facing health-related issues while in school. First, these students can be encouraged to return once the health concern has been addressed. Postsecondary institutions should make it easy for students to return in this case. Second, schools can help students explore other options that might be practical, such as long leaves of absence or taking courses using some form of distance education provided students are interested and able to do this while away from the physical campus.

Since another common reason cited for dropping out was poor financial situation, policy makers who deal with student financial aid, as well as rehabilitation and campus-based financial aid professionals need to gain better insight into the special situations faced by some students with disabilities and address these in order to assist students in financial distress. The older age of students with disabilities, who may no longer be living with parents and who may already have a family, should be considered. Moreover, some students are forced to choose between being eligible for funding to go to school and being eligible to receive financial assistance through other disability support programs for life's necessities. Since graduation from post-secondary education for individuals with disabilities is related to employment (e.g., Fichten et al. 2012b), it is in everyone's interest, including society's, to facilitate their graduation.

Appendix: Theory of planned behavior predictors: student version[1]

For each statement below, rate your level of agreement using the following scale:

1— Strongly disagree
2— Moderately disagree
3— Slightly disagree
4— Slightly agree
5— Moderately agree
6— Strongly agree

Subjective Norms

- Most people who are important to me think that I should complete my program of study.
- Most people who are important to me would be disappointed if I did not complete my program of study.
- Most people who are important to me expect me to complete my program of study.

Perceived Behavioral Control

- I have complete control over completing my program of study.
- I can overcome any obstacles or problems that could prevent me from completing my program of study if I want to.
- It is mostly up to me whether or not I complete my program of study.
- For me to complete my program of study will be:[2]

1— Very easy
2— Somewhat easy
3— Slightly easy
4— Slightly difficult
5— Somewhat difficult
6— Very difficult

Attitude Answer the following questions about how you view completing your program of study. Completing my program of study will be:

	Very	Somewhat	Slightly	Slightly	Somewhat	Very	
Rewarding	3	2	1	−1	−2	−3	Punishing
Useful	3	2	1	−1	−2	−3	Useless
Bad	−3	−2	−1	1	2	3	Good
Harmful	−3	−2	−1	1	2	3	Beneficial
Wise	3	2	1	−1	−2	−3	Foolish
Unpleasant	−3	−2	−1	1	2	3	Pleasant
Desirable	3	2	1	−1	−2	−3	Undesirable
Boring	−3	−2	−1	1	2	3	Exciting

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[1] Adapted from Davis et al. (2002).

[2] Reverse scores.

Scoring Average scores, with higher means indicating more favorable responses. Add 3 to Attitude Scale mean. A Total score is calculated by summing the three Scale means.

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