

Academic motivation in post-secondary students: Effects of career outcome expectations and type of aspiration

José F. Domene
University of New Brunswick

Krista D. Socholotiuk
University of British Columbia

Lyndsay A. Woitowicz
Trinity Western University

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Abstract

Using a social cognitive theory framework, we examined the effects of career outcome expectations (COE) and aspiration to enter a science, technology, or math (STM) career on post-secondary academic motivation. Data were collected online from a sample of 380 post-secondary students in Canada and the United States. Analysis of covariance revealed that, compared to other post-secondary students, those with high COE and STM to be more intrinsically and extrinsically motivated in terms of their academics. Overall, the results suggested that expanding students' expectations of a successful career outcome and promoting interest in STM occupations may benefit their academic motivation. Limitations and implications are discussed.

Keywords: Post-secondary education; academic motivation; career development; occupational aspirations

Résumé

À partir d'une théorie sociocognitive, nous avons étudié les effets de l'espérance de résultats de carrière (ERC) et de l'aspiration à une carrière en science, technologie ou mathématique (STM) sur la motivation scolaire postsecondaire. Les données ont été collectées en ligne à partir d'un échantillon de 380 étudiants de niveau postsecondaire au Canada et aux États-Unis. Des analyses de covariance ont révélé que, comparativement aux autres étudiants de niveau postsecondaire, ceux qui avaient un niveau élevé d'ERC et de STM étaient plus motivés intrinsèquement et extrinsèquement par leur cheminement académique. Dans l'ensemble, les résultats suggèrent

qu'une augmentation des attentes au regard d'une carrière satisfaisante et qu'une promotion des STM pourraient être bénéfiques à la motivation scolaire. Des limites et implications sont présentées.

Academic motivation in post-secondary students: Effects of career outcome expectations and aspirations

Introduction

Participation in post-secondary education in Canada has increased over the past two decades, to the point where obtaining some form of advanced education is becoming the norm for many Canadians (Knighton, Hujaleh, Iacampo & Werkneh, 2009). For example, Andres and Adamuti-Trache (2008) found that 86% of their large sample of British Columbia youth had obtained some form of post-secondary credential (community college diploma, bachelor's degree, professional degree) within 15 years after high school. The pursuit of higher education has been promoted by parents and the federal government, at least in part in response to the expectation that Canada is transforming from a resource-based to a knowledge-based economy, in which most future occupations will require some kind of post-secondary credential (Anisef & Sweet, 2005; Human Resources Development Canada, 2002).

Unfortunately, the high post-secondary participation rate and promotion of post-secondary education as the optimal way for students to realize more beneficial employment outcomes may contribute to the large variation in academic motivation levels that has been observed in Canadian university and community college populations (Faye & Sharpe, 2008; Mills & Blankstein, 2000; Vallerand & Bissonnette, 1992). The consequences of having low academic motivation have been well documented, and include lowered academic performance (Fortier, Callendar, & Guay, 1995), difficulties with psychological adjustment (Miquelon, Vallerand, Grouzet, & Cardinal, 2005), and, for non-intrinsic forms of motivation at least, increased procrastination regarding schoolwork (Senécal, Koestner, & Vallerand, 1995).

One potential way to assist students experiencing difficulties with their motivation levels is for post-secondary counsellors, academic advisors, and educators to more strongly explicate the links between students' courses and their later life goals. Supporting this possibility, Peetz, Wilson, and Strahan (2009) recently found that first-year undergraduate students who were induced to think about graduation and their possible selves upon degree completion as being closer to their present state reported higher academic motivation than those who were induced to think about graduation as more distant. Indeed, psychoeducational and therapeutic interventions to clarify students' aspirations and promote positive outcome expectations have already begun to emerge (Diegelman & Subich, 2001; Fouad, Smith, & Enochs, 1997; Kelly & Price, 2009; McWhirter, Crothers, & Rasheed, 2000). However, as strategies to improve academic motivation, these types of interventions rely on the assumption that altering these aspects of an individual's career development will have an effect on students' sense of motivation.

Social Cognitive Career Theory (SCCT) provides some theoretical justification for this expectation. Drawing on Bandura's (1986) general social cognitive theory, SCCT is a systematic framework for conceptualizing career development, including what contributes to educational and occupational performance and persistence (Lent, Brown, & Hackett, 1994). Lent, Brown, and Hackett postulate that three specific psychological mechanisms exert particular influence on career-related motivation and behaviour: (a) self-efficacy beliefs, (b) goal representations, and (c) outcome expectations. Of the three social cognitive mechanisms, self-efficacy has been the primary focus of research, generating a voluminous body of research literature (for a review, see Gainor, 2006).

In contrast, the concept of career outcome expectations, has received relatively little

empirical attention (Fouad & Guillen, 2006). Lent et al. (1994) define career outcome expectations as the anticipated results or desired outcomes of career decisions and behaviour; that is, outcome expectations involve the imagined consequence of performing particular behaviours, and may be elicited by responding to questions like “If I do this, what will happen?” Outcome expectations are proposed to uniquely influence the exercise of personal agency in that people will decide to act or not act to achieve goals in part based on their assessment of the outcome their actions will generate. For example, if a young woman believes that individuals in her field of work are hired primarily on the basis of previous work experience rather than academic credentials, she may not pursue the advanced training in her field, even if she has high self-efficacy and ability levels (this applies to students of both genders). Consequently, according to the SCCT framework, career outcome expectations can be considered one of the determinants of students’ motivation for engaging in their academics.

In Canada and elsewhere, participation in post-secondary education is a prerequisite for entry into many career paths (Baran, Bérubé, Roy, & Salmon, 2000; Fisher, Rubenson, Jones, & Shanahan, 2009; Hektner, 1995). It follows, then, that if a student has positive expectations for a career outcome, these expectations are likely to be an important source of motivation for engaging in his or her program of study. Conversely, students with low career outcome expectations will have less reason to persist with their education or excel in their academics. Additionally, although career outcome expectations and self-efficacy beliefs are similar insofar as both are self-referent mechanisms influencing motivation and behaviour, outcome expectations are less attached to core personal beliefs (e.g., confidence in abilities) (Bandura, 1986, 1997). As such, the development of expectation-focused intervention programs may

become a highly viable option for educators and counsellors seeking to assist post-secondary students.

It must be recognized, however, that academic motivation is not a unidimensional construct, and career outcome expectations may have differential effects on different aspects of academic motivation. Working from a self-determination theory perspective, Vallerand, Pelletier, Blais, Brière, Senécal, and Vallières (1992, 1993) proposed a multidimensional model of the motivation that individuals possess for their school-related drive and determination. Within their model, intrinsic motivation is conceptualized as a drive that emerges from within, being enhanced by students' desire to gain knowledge, to achieve competence and mastery, and for the intrinsic pleasure and stimulation of achieving. In contrast, students' sense of extrinsic motivation is the drive to perform academically for instrumental reasons; that is, external rewards and punishments, and to maintain socially important values. Intrinsic and extrinsic motivation are theorized to co-occur for an individual; that is, a person may be both intrinsically and extrinsically motivated to pursue a particular academic goal. Although not a focus of the present study, Vallerand and colleagues (year) also identify a third dimension of academic motivation, amotivation, which is reflective of students' lack of motivation.

The longer-term employment consequences of obtaining or failing to obtain a post-secondary credential should be conceptualized as primarily an instrumental motivator within Vallerand and colleagues' model of academic motivation. As such, the theory suggests that career outcome expectations should have a greater effect on extrinsic than on intrinsic academic motivation, which, in turn, suggests a need to attend to intrinsic and extrinsic motivation separately in examining the effects of career outcome expectations on academic motivation.

Present Study

As an important precursor to examining the potential benefits of using career-oriented interventions to improve post-secondary students' academic motivation, the present study was designed to establish whether students' career outcome expectations and aspirations are linked to their sense of intrinsic and extrinsic motivation for their program of study. Based on SCCT (Lent et al., 2004) and the work of Vallerand and colleagues (1992, 1993) on the measurement of academic motivation, it was hypothesized that students with high expectations for a successful career outcome would have higher extrinsic motivation than their peers with lower expectations. In contrast, no such effect was anticipated for the effect of career outcome expectations on intrinsic motivation.

In designing this study, it was also recognized that some educational paths are more readily linked to specific future occupations than others. Many scientific, technological, and mathematics (STM) occupations have either (or both) advanced degree requirements that are highly competitive to enter (i.e., high academic achievement is a necessary prerequisite to pursuing these career paths), and more specialized and restricted programs of study starting from the beginning of post-secondary education and even earlier. Consequently, students who are aspiring to careers in scientific and technological fields are more likely to be aware of the connection between their schooling and their future careers and this awareness is likely to increase their motivation for their academics. Therefore, our second hypothesis is that students with aspirations to enter science, technology, and math careers will have higher levels of intrinsic and extrinsic academic motivation than students with other career aspirations. Academic motivation may be affected by how long students have been in post secondary education and by

their previous academic performance. It was decided to statistically control for the influence of these variables, to better isolate the influence of career outcome expectations and STM aspirations on academic motivation.

Finally, given the existence of sex differences in both career outcome expectations (Mello, 2008; Metz, Fouad, & Ihle-Helledy, 2009; McWhirter, 1997) and interest in STM careers (Jacobs, 2005; Watt & Eccles, 2007), it is possible that the effects of outcome expectations and aspirations on academic motivation differ for males and females. Therefore, the possible interactions between students' sex and their expectations and aspirations were also explored in this study.

Method

Participants

The final sample was comprised of 380 individuals (72.4% female and 27.6% male) between the ages of 17 and 25 ($M = 20.43$, $SD = 2.04$). All participants were enrolled in post-secondary education programs in Canada (78.4%) or the United States (21.6%), with 88.7% in undergraduate degree programs, 9.1% in graduate programs, and 2.2% in trades certification, diploma, or other educational programs. A variety of ethnicities were present in the data set, including European ancestry (74%), Asian (13.6%), Latino/Caribbean (2.3%), African (1.7%), First Nations (1.1%), and mixed heritage (7.3%). Participants were recruited using electronic and physical advertisements posted at post-secondary institutions in British Columbia and Washington State, and on the Internet. The chance to win one of three \$50 gift certificates to a major online retailer was offered as an incentive for participation.

Instruments

Data were collected online, using an anonymous, self-report survey method. The instruments were embedded in a larger questionnaire package assessing various aspects of educational functioning, career development, and interpersonal relationships. Pearson and point-biserial intercorrelations revealed low to moderate relationships among the variables used in the analyses.

Academic motivation.

The Academic Motivation Scale (Vallerand et al., 1992, 1993) was used to assess extrinsic motivation and intrinsic motivation for engaging in participants' programs of study. The Academic Motivation Scale (AMS) is a 28-item, self-report, 7-point Likert scale instrument, asking students to indicate how well different statements, such as "Because I experience pleasure and satisfaction while learning new things" (intrinsic) and "Because I think that a college education will help me better prepare for the career I have chosen" (extrinsic), correspond to why they are currently in post-secondary education. Only the intrinsic (12 items) and extrinsic (12 items) sub-scales of the instrument were used in the present study. The AMS was designed specifically for use with college and university student populations (Vallerand & Bissonnette, 1992), and has been shown to have good validity and reliability (Grouzet, Otis, & Pelletier, 2006; Vallerand et al., 1992, 1993). Cronbach alphas of .92 for the intrinsic sub-scale and .87 for the extrinsic sub-scale revealed high levels of internal consistency in the present study.

Career outcome expectations.

Participants' career outcome expectations (COE) were assessed using McWhirter's Vocational Outcome Expectations scale. Grounded in SCCT, this unidimensional scale is

designed to assess youths' overall sense of being able to achieve a successful vocational outcome. It is composed of six 4-point Likert items, such as "I will be successful in my chosen career/occupation," assessing participants' overall sense of being able to obtain a successful outcome for their future career. Possible scores range from 4 to 24. The scale has been used to examine the effects of vocational education programs (McWhirter et al., 2000), career aspirations of rural youth (Rasheed Ali & Saunders, 2009), and the career development of international university students (Reynolds & Constantine, 2007). It has been shown to have adequate test-retest reliability and good internal consistency in previous research. In the present study, the internal consistency of the scale was found to be high, with a Cronbach alpha of .83. However, COE was found to be non-normal and examination of the histogram of scores revealed a distribution with multiple peaks and a severe negative skew, suggesting that students' outcome expectations should not be conceptualized as a continuous variable in this sample. Consequently, participants were divided into three approximately equal groups based on their scores: Low COE ($n = 125$), defined as those scoring 18 or less; Medial COE ($n = 106$), scoring 19 to 21; and High COE ($n = 149$), comprised of those scoring 22 or higher on the scale .

STM aspirations.

Participants' aspirations to enter a career in science, technology, and math was coded as a dichotomous variable, based on participants' responses to the question: "What occupation or other career path do you plan on pursuing, once you have finished all your schooling?"

The remaining variables—participant sex, number of completed years of post-secondary education (YPS), and academic performance in their final year of high school (GPA)—were self-reported by the participants in the demographic portion of the questionnaire. The average

participant had completed nearly 3 years of post-secondary education (YPS $M = 2.96$, $SD = 2.02$), and reported having a satisfactory high school academic performance (GPA $M = 2.58$, $SD = 0.68$).

Data Preparation and Analysis Procedures

Prior to conducting the analyses, the data were screened for problems with missing data and violations of test assumptions. From the 388 respondents who completed the entire survey, those with missing data on the dependent and independent variables were removed, with the exception of 7 cases whose missing data on the STM was estimated from their reported field of study. This resulted in final sample of 380 participants. Mean substitution (i.e., replacement of missing data with sample mean scores) was used to estimate the number of completed years of post-secondary education for four participants who omitted that question. There was no missing data for Sex or GPA. No outliers or overly influential cases were present in the data set. Reflected square root transformations were successful in correcting a problem with significantly negative skew in both motivation variables (the scores were then reflected back to facilitate interpretation). The assumptions of independence between the independent variables and covariates and equality of error variances were met, as were the assumptions for inclusion of the covariates in the model (i.e., linear relationships between the covariates and the outcome variables; homogeneous residual variances within factors; homogeneity of regression coefficients within factors).

The hypotheses were tested using analysis of covariance. Separate analyses were conducted for extrinsic and intrinsic motivation because the two constructs are conceptually distinct (Vallerand et al., 1992, 1993). In both analyses, the independent variables were COE,

STM, and Sex, with YPS and GPA were entered into the models as covariates. All data preparation and analyses were conducted using SPSS, version 17.

Results

Pearson and point-biserial intercorrelations among the variables used in the analyses are reported in Table 1. When the effects of YPS and GPA are partialled out (i.e., statistically controlling for their influence), COE and STM significantly affected extrinsic motivation (see Table 2). Additionally, although no significant interactions with Sex emerged, the Sex by STM interaction approached significance. Intriguingly, the YPS covariate was also significant, with the parameter estimate revealing an inverse relationship with extrinsic motivation ($B = -.02$). A Bonferroni-corrected pairwise comparison revealed only one significant difference between the groups: Participants with high COE had higher levels of extrinsic motivation than those in the low COE group ($MD = .18, p < .05$, Cohen's $d = .56$). Additionally, examination of the subgroup means (Table 3) revealed that students aspiring to a career in science, technology, or mathematics were more externally motivated than their peers who aspired to other career paths, although the magnitude of this difference (Cohen's $d = .36$) was somewhat smaller than the COE effect size.

Table 1.						
<i>Intercorrelations Among Variables in the ANCOVA Analyses</i>						
	Intrinsic Motivation	COE	YPS	GPA	STM ¹	Sex ¹
Extrinsic Motivation	.47*	.22*	-.11*	.07	.12*	-.12*
Intrinsic Motivation		.20*	.01	-.04	.10	-.05

COE			.07	.00	-.03	-.06
YPS				.01	.06	-.07
GPA					.09	.09
* $p < .05$						
¹ Results in final two columns are point-biserial correlations; all other results are Pearson correlations.						

Table 2.
Effects of Career Outcome Expectations (COE) and Aspiration for a Science, Technology, or Math Career (STM) on Extrinsic Academic Motivation, Controlling for Number of Years in Post-Secondary Education (YPS) and High School Academic Performance (GPA)

	df	F	p
YPS	1	8.19	.004*
GPA	1	2.02	.156
COE	2	5.88	.003*
STM	1	12.85	< .001*
Sex	1	.08	.779
COE X STM	2	2.16	.116
COE X Sex	2	.56	.570
STM X Sex	1	3.37	.067

COE X STM X Sex	2	.75	.475
Error	366		
* $p < .05$			

Table 3.			
<i>Mean Extrinsic Motivation Scores for Participant Sub-Groups</i>			
	Type of Career Aspiration		
	STM Career	Other Career	Total
	M (SD)	M (SD)	M (SD)
COE	n	n	n
High	1.38 (.35) 21	1.35 (.31) 128	1.36 (.32) 149
Medium	1.47 (.26) 11	1.20 (.29) 95	1.23 (.30) 106
Low	1.27 (.25) 21	1.18 (.30) 104	1.19 (.29) 125
Total	1.36 (.30) 53	1.25 (.31) 327	1.27 (.31) 380

A similar pattern of results emerged for intrinsic motivation, with the main effects of COE and

STM both emerging as significant (Table 4). However no interactions even approached significance and, in this analysis, none of the covariates were significant. Post hoc analysis using Bonferroni-corrected pairwise comparisons revealed that students with high COE had significantly greater levels of intrinsic motivation than those in the low COE group ($MD = .20, p < .05$), with a moderate effect size (Cohen's $d = .46$). As can be seen from Table 5, STM students also had higher levels of intrinsic motivation than non-STM students although, again, the effect size was somewhat smaller than the effect of COE (Cohen's $d = .25$).

Table 4. <i>Effects of Career Outcome Expectations (COE) and Aspiration for a Science, Technology, or Math Career (STM) on Intrinsic Academic Motivation, Controlling for Number of Years in Post-Secondary Education (YPS) and High School Academic Performance (GPA)</i>			
	df	F	p
YPS	1	.04	.852
GPA	1	.92	.337
COE	2	6.42	.002*
STM	1	6.25	.013*
Sex	1	.26	.614
COE X STM	2	1.67	.191
STM X Sex	2	.72	.487
COE X Sex	1	1.42	.235
COE X STM X Sex	2	.75	.495

Error	366		
* $p < .05$			

Table 5.			
<i>Mean Intrinsic Motivation Scores for Participant Sub-Groups</i>			
	Type of Career Aspiration		
	STM Career	Other Career	Total
	M (SD)	M (SD)	M (SD)
COE	n	n	n
High	1.33 (.32) 21	1.21 (.33) 128	1.23 (.33) 149
Medium	1.21 (.31) 11	1.06 (.25) 95	1.08 (.26) 106
Low	1.10 (.33) 21	1.09 (.27) 104	1.09 (.28) 125
Total	1.21 (.33) 53	1.13 (.30) 327	1.14 (.30) 380

Discussion

The results of this study reveal important effects of career outcome expectations and

occupational aspirations on post-secondary students' academic motivation, with the hypotheses being largely supported. First, with the effects of number of years of post-secondary education completed and previous academic performance partialled out, students with high COE were more highly motivated, on both the intrinsic and extrinsic dimensions of academic motivation, than their peers with lower outcome expectations. Similarly, students aspiring to careers in science, technology, or math had significantly higher intrinsic and extrinsic academic motivation than students aspiring to other career paths. Finally, although no statistically significant interaction effects were found, the interaction between sex and aspirations approached significance for extrinsic motivation. This somewhat ambiguous test result reveals the need for further empirical examination of the possibility that male and female students may differ on how extrinsic motivation is affected by career aspirations.

Limitations

One limitation with the quasi-experimental research design that was used is that all variables were assessed at a single point in time using self-report measures. Although there is theoretical justification for expecting outcome expectations and aspirations to be antecedents of academic motivation (Lent et al., 1994), the fact that the COE and STM variables were not directly manipulated in the study prevents strong causal conclusions from being made. Nonetheless, the design permitted exploration of the issue and generated results that justify the expenditure of resources to develop programming to improve students' expectations and aspirations, which can then be systematically assessed in terms of their effects on academic motivation.

The design was also limited by the use of entirely self-report methods of data collection.

Consequently, the results reflect participants' perceptions of themselves, and there may be some discrepancy between actual and reported experiences of COE and intrinsic and extrinsic academic motivation. This potential problem was mitigated by the use of established measures for all the variables of interest.

Another potential limitation related to the data collection is the use of a single item indicator to assess STM. In classical psychometric theory, single item indicators are perceived to jeopardize the reliability of a measure, and to provide inadequate breadth of measurement. However, current research on test construction calls into question the assumption that single item indicators are automatically problematic, with the psychometric adequacy of single item assessment constructs being demonstrated for many psychological concepts, including employment satisfaction (Nagy, 2002), emotional well-being (Hürny et al., 1996), organizational justice (Jordan & Turner, 2008), and aspects of personality (Grice, Mignogna, & Badzinski, 2011). Indeed, for a unidimensional concept such as whether students are aspiring to a career in science, technology, or math, the argument could be made that multiple items are redundant. It is perhaps for this reason that the method used for assessing STM in the present study, that is coding for STM interest from the actual occupations listed by students as their career aspirations, has been widely used in previous educational research (e.g., Shapka, Domene, & Keating, 2006; VanLeuvan, 2004; Watt, 2006; York, 2008).

One difficulty with interpreting the non-significant interactions with sex was the uneven distribution of males and females in the sample. This imbalance may have influenced the results, requiring great caution when making any interpretations about sex difference from the data. Future research on sex differences in the effects of COE and STM on academic motivation

should take steps to ensure more equal numbers of males and females.

Finally, a limitation to the generalizability of this study is the nature of the sample. Approximately 89% of participants were completing bachelors degrees, which raises the possibility the results may be less applicable to students in other kinds of post-secondary education programs (e.g., professional degrees, trades certification programs). Additionally, involvement was voluntary and required students to access and complete the online survey on their own initiative. Consequently, it is possible that students with low levels of motivation were under-represented in the sample.

Together, these limitations indicate that the results of this study must be interpreted with caution, particularly in terms of the results related to sex, and its application to people other than undergraduate students. Additionally, the fact that this study did not employ an experimental research design means that extraneous and alternative influences cannot be completely ruled out.

Interpretation of Results

As a whole, the results of this study lend support to the SCCT framework for understanding the connections between aspects of career-related cognitions and academic motivation. Additionally, this study suggests that changes in COE and aspirations for STM occupations may have important implications for post-secondary students' motivation for their programs of study. Although there are several important design limitations with this study that must be acknowledged, there is now sufficient empirical support to warrant investing resources to develop interventions to promote COE and STM aspirations, in an effort to enhance academic motivation. Developing such interventions will also permit experimental research on the potential beneficial effects of modifying these aspects of students' thinking about future careers

on their academic motivation. The question of sex differences in the links between outcome expectations, aspirations, and motivation remains an open one. Therefore, practitioners seeking to develop these interventions should consider the possibility of attending to sex when creating such curricula.

The significance of the main effect of COE on intrinsic academic motivation requires further consideration. There are at least two possible explanations for this unanticipated result, both of which would apply independently of the effects of STM (recall that the interaction between COE and STM was non-significant). It is possible that the current generation of post-secondary students may place a great importance on obtaining a career that is personally fulfilling and reflects what they are passionate about. Indeed, recent qualitative research reveals that some youths are encouraged by their parents to follow their occupational ambitions and the path that is most fulfilling for them (Domene, Socholotiuk, & Young, in press; Jones, O'Sullivan, & Rouse, 2006). For these youth, who emphasize the intrinsic aspects of work, future career may serve as both an intrinsic and an extrinsic motivator, rather than being purely extrinsic. Alternatively, students with higher COEs may already identify with their future occupation, and treat their education program not as a hurdle to overcome, but rather part of the process of learning their trade, and constructing a sense of self as a professional in their field of work. Thus, they may possess a more general mastery-related intrinsic motivation reflecting a desire to achieve mastery in their profession as much as in their education. This, in turn, may be directly related to their expectations for achieving a successful career outcome.

One alternative interpretation of the results is that students with high COE and aspirations for STM careers may be inherently more academically motivated in general. That is, some other

aspect of their psychology or social context may be responsible for the patterns of aspiration, expectation and motivation that were observed. Given the literature suggesting that self-efficacy may be a direct influence on academic motivation (Scheel & Gonzales, 2007; Scheel, Madabhushi, & Backhaus, 2009; Schunk, 1991; Zimmerman, 2000) and the fact that it was not possible to separate out the potential overlapping relationships between self-efficacy, outcome expectations, and academic motivation in this study, efficacy perceptions must be considered as one such variable. However, self-efficacy is theorized to be a different construct from outcome expectations, with the two having different influences in many situations (Lent et al., 1994). Therefore, the explanation that students' outcome expectations, aspirations, and motivation are entirely driven by their efficacy perceptions is inconsistent with the SCCT framework.

One final alternative that merits consideration is that previous academic performance may, in part, be responsible for students' subsequent outcome expectations, appraisals of their aspirations, and levels of academic motivation. This possibility is mitigated, however, by the fact that the effects of one measure of previous performance (i.e., academic performance in the final year of high school) was partialled out of the models as a covariate. That is, to reduce the possibility that the results were the result of students' academic performance, steps were taken within the statistical analysis process to control for the variation in scores that could be attributed to academic performance. Additionally, previous research reveals that the direction of influence is at least in part from motivation to performance (Fortier et al., 1995), making it more consistent with theory that the direction of causality is from motivation to performance, rather than the other way around.

Overall, there is a clear need for additional research to address some of the outstanding

questions in this area, such as the efficacy of programs designed to modify students' career expectations and aspirations on academic motivation, the reasons why intrinsic academic motivation is affected by COE, and to clarify potential sex differences in the process. The findings of this study, that career outcome expectations and type of aspiration are concepts with moderate yet still substantive links to post-secondary students' intrinsic and extrinsic academic motivation, can serve as a stepping stone to these future projects, and suggests that these psychological constructs should be included in the on-going effort to comprehend and improve post-secondary students' drive to succeed academically.

Conclusion

Despite the potential difficulties raised by the limitations inherent in research of this type, the present study was successful in adding to knowledge about the role of career outcome expectations in young adults' educational and career development, an issue that has received relatively little attention in the empirical literature (Fouad & Guillen, 2006). The practical importance of the results is twofold: career-related outcome expectations may be a worthwhile target for intervention when attempting to enhance post-secondary student engagement. They may also assist those at risk for withdrawing from their programs of study due to a perceived lack of relevance between their education and their future life. Outcome expectations can emerge from many sources, such as vicarious experience, or imagined consequences of what could happen given a course of action (Bandura, 1986, Lent et al., 1994). Consequently, there may be many different avenues for post-secondary educators and counsellors to promote students' outcome expectations in an effort to encourage and enhance post-secondary students' persistence with their academic programs. In light of the wide variation in academic motivation level

experienced by students in universities and community colleges, developing and evaluating such interventions becomes an important next step for applied research in this field.

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