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Gender-Differentiated Motivation and Academic Self-Concept as Predictors of Student Retention Among Community College Students

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Abstract: Attrition in community colleges has become a major focus of education research over the last four decades. This cross-sectional aimed to establish associations between student attrition and predictors including gender-differentiated motivation styles and academic self-concept in a community college population. A sample of 339 students enrolled in semester one of a two-year full-time diploma program at Humber College were recruited and surveyed, and their responses were crops-referenced with institutional data to establish these associations. The findings showed no difference in motivational styles between genders. Academic self-concept score significantly predicted first semester attrition, while motivational styles were predictive of second semester attrition.

Keywords: Motivation, Gender, Academic Self-Concept, Retention, College.

Introduction

Student attrition has been a persistent problem for community colleges in Ontario since their establishment in the 1960s. During the 2018-19 academic year, 23% of college students in Ontario dropped out of their program (College Ontario, 2019). Rates as high as 40% have been observed in the United States—with 75% of these being first generation students (National Student Clearing House Research Centre, 2022).

Postgraduate education is also a significant determinant of socio-economic success (Statistics Canada, 2018), with nearly 87% of employed Canadians having a post-secondary education in 2020 (Statistics Canada, 2021). Community colleges are therefore critical for meeting labour demands in Canada (Association of Canadian Community Colleges, 2009). However, most research on this problem to date has been conducted in the United States rather than in Canada.

Early attrition studies found that community college students were more likely to drop out (43.6%) than university students. Despite this, the existing models are limited to university populations.

The literature on student attrition suggest that behaviours associated with eventual attrition can start from the first class of the first semester, through to the end of the second semester (Bradburn, 2002; Driscoll, 2007; Horn & Carroll, 1998). But despite increased attention in recent decades, research has not been able to adequately explain this in the community college context (Fisher & Engemann, 2009; Ishitani, 2016; McMurray & Sorrells, 2009; Roman, 2007), especially focusing on the first year (Andreu, 2002; Reason, 2003).

Models of Student Attrition

The existing postsecondary attrition models are based on four-year degree institutional frameworks. Three of these that have shaped the mainstream research on student attrition in higher education serve as a basis for the current study.

Spady's Model of the Drop out Process

According to Spady's Model of the Drop out Process (Spady, 1970), students who fail to identify with other students' values and integrate into the college's academic and social systems are more likely to drop out. In his revised model, Spady (1970) argued that *academic self-concept* (ACS) was also a powerful factor, which later research has supported (Hansen & Henderson, 2019; Lyon, 1993; Marsh et al., 1988; Marsh & Shavelson, 1985; Shavelson & Bolus, 1982).

Tinto's Institutional Departure Model

Tinto's (1975) Institutional Departure Model incorporates personal and institutional attributes as strong factors of success and persistence.

According to this model, students enter post-secondary education with a set of personal attributes (e.g., academic preparedness) that may not be compatible with an optimal experience and lead to dropping out.

Like Spady, Tinto included ASC as a predictor of attrition. Subsequent research has shown a positive correlation between ASC and academic success (e.g., Hotulainen & Shofield, 2003; Marsh, 2004; Montague & Garderen, 2003; Pyryt & Mendaglio, 1994; Ziegler et al., 1996).

Bean and Metzner's Non-Traditional Undergraduate Student Attrition Model

Bean and Metzner's model (1985) focuses on the interaction between psychological variables (e.g., motivation, stress, and study habits) and environmental variables (e.g., program advising, external encouragement), and argues that attrition can be predicted by certain interactions between them. The addition of motivation as a factor is of particular relevance to the current study.

Academic Self-Concept

There is currently no consensus on the definition of self-concept in the literature, but it is frequently used as a substitute for terms such as self-regard, self-identity, self-esteem, self-perception and/or self-efficacy (APA Dictionary of Psychology, 2020; Cicero, 2017; Jansen et al., 2015, Karimova & Csapó, 2020; Rüschenpöhler & Markic, 2019). This article defines it as the mental representation of one's self-evaluation of their abilities or progress in an academic environment (APA Dictionary of Psychology, 2020; Bracken et al., 2009; Brunner et al., 2010; Han, 2019), and focuses on *academic* self-concept (ASC) in particular based on the models of Spady (1971) and Tinto (1975), and because it has been found to be a better predictor of academic success than self-concept in general (e.g., Hansen & Henderson, 2019; Honicke & Broadbent, 2016; Jansen et al., 2015; Khalaila, 2015; Marsh et al., 2017; Smith, 2019).

Gender and Academic Achievement

Gender-based differences in child development have been known to exist for several decades (Kagan et al., 1971; Anastasi, 1958; Freedman & Sears, 1965; Bryden, 1972; Brownfield, 1965), but without a clear consensus on how they manifest (Block, 1976). More recent research has described gender differences in students' academic development with many reporting differential outcomes (e.g., Hedges & Olkin, 1985; Hunter et al., 1986; Hyde, 2014), often finding males to better performance on various cognitive and behavioural tasks than females. But the literature has been inconsistent in this regard (Andrews, 2018; Cutumisu & Bulut, 2017; Fisher et al., 2020; Plante et al., 2019; Steegh et al., 2019), with females outperforming males in math, science and reading in some countries (Cutumisu & Bulut, 2017), and vice versa in others (Aurah, 2017; Cahan et

al., 2014). In a meta-analysis on the topic, Hyde (2014) argued against any strong gender differences, with most studies having small effect sizes under (d = <.20).

Studies on gender as a factor of attrition specifically have also yielded inconsistent results, with some finding higher attrition for males (Baxter, 2004; Ma & Frempong, 2008), others reporting higher rates for females (Looker & Lowe, 2001; Thiessen, 2001), and some finding no difference (Almås et al., 2016; Aquino, 1990; Mohammadi, 1994).

Motivation Types: Instrumental vs. Integrative

Motivation has also been found to be an important driver of academic outcomes (Graham & Hudley 2005; Pintrich, 2003; Schunk & Zimmerman, 2007). Deci and Ryan (2000) proposed a multidimensional model that included intrinsic (or integrative) motivation, extrinsic (or instrumental) motivation, and amotivation.

Gardner and Lambert (1959; cited in Gardner, 2020) developed the Orientation Index to measure these competing *motivational styles* (MS), represented by the integrative–instrumental dichotomy (Gardner, 2020; Zangeneh, 2015). Integrative motivation describes wanting to pursue goals like higher education because it feels inherently rewarding (Gogol et al., 2014), whereas instrumental motivation is the desire for practical external rewards like a good paying job (Al-Hoorie & MacIntyre, 2020; Masgoret & Gardner 2003; Gardner, 2020; González Ardeo, 2016; Hudson, 2000).

Much of the available evidence on academic achievement and motivation is inconsistent. Some studies have linked integrative MS with academic persistence (Asmar et al., 2011; Brubacher & Silinda, 2019; Fong et al., 2018; Gardner & Lambert, 1972; Heid, 2016; Janke, 2020; Rump et al., 2017; Rutledge, 2019), others have found instrumental MS to be more predictive of persistence (e.g., Al-Ta'ani, 2018; Boddy, 2020; Hammoudi, 2019; Kirk, 2020; Meyer & Thomsen, 2018; Morgan, 2021; Saito-Abbott & Samimy, 1997; Savage et al., 2019; Speiller, 1988; Tanvir & Chounta, 2021; Vollet & Kindermann, 2020), while another set of studies point to the importance of both types (e.g., Deci & Ryan, 2000; Masum, 2016; Güvendir, 2016; Fischer et al., 2019). Furthermore, few studies have considered motivation as an attrition factor, especially in community college settings.

Gender and Motivational Style

Emerging findings do, however, point to a link between gender and motivational style (Arnold & Rowaan, 2014; Ehrman et al., 2003; Gujare & Tiwari, 2016; Huang & Uba, 1992; Kirk, 2019; Zangeneh, 2015; Zangeneh et al., 2004). Studies have shown that males tend towards integrative motivational orientations (e.g., "I need an A grade for future graduate school entrance"), while females have more integrative motives (e.g., "I am motivated to study psychology because I enjoy learning about the subject"). There are however no published studies relating attrition to gender-

differentiated motivational style.

Objectives

Despite increasing interest in this topic, the research has not been able to fully capture the factors of attrition among community college students and any associations with motivational style (MS), academic self-concept (ASC), and gender. This cross-sectional survey research explored this gap by examining these potential factors of student attrition in community colleges, with a sample of students from Humber College in Toronto.

The first three hypotheses were that student attrition rate would be associated with ASC, integrative MS, and instrumental MS. The next three were that these three scales would differ by gender.

Methods

Participants and Sampling

This survey study used convenience sampling to recruit students in semester one of a two-year full-time diploma program in the faculties of either Business or Applied Science and Technology at Humber College. Only students with a minimum of a 60% course load were included. Humber Collage granted access to the database of registered students to use for contacting participants, and flyers were also posted in areas frequented by these students. There were two cohorts of students, one in Fall 2018 and one in Winter 2019.

Participants were asked to complete a survey including two questionnaires to measure ASC and MS: the Self-Description Questionnaire II (Marsh, 1992) and the Motivation Scale Questionnaire, with some additional demographic items.

Additional data on the students came from the institutional database that was used to contact the students. This included enrollment status, admission date, program of study, and gender.

This research followed ethical guidelines of Humber College and Canada's Tri-Council Policy Statement, and all students provided informed consent prior to participation.

Instruments

The SDQ-II includes 29 items with statements that participants rate agreement with on a 6-point scale where 1 = false and 6 = true. The items are divided into math, verbal, and general academic abilities. Marsh (1992) reported Chronbach's α values between .83 and .92 for each subscale.

The Motivational Scale questionnaire, adapted from Gardner and Lambert (1972), includes 28 items examining instrumental motivation (e.g., "In order to obtain a more prestigious job later on") and integrative motivation (e.g., "Because I really like going to school"), rated on a five-point Likert scales from "Strongly disagree" to "Strongly agree." Items were scored as from 1 to 5, summed, and then divided by the total possible

score (5*28 = 140). Gardner and Lambert (1972) found it to have good internal consistency (α = .91).

Half of the items on both scales are phrased negatively to detect invalid responses. These were reverse coded prior to calculating scale scores.

Analysis

Statistical analyses were performed with SPSS v. 25. Instrumental MS, integrative MS, and ASC were treated as quasi-independent or predictor variables contributing to the dependent variable of student persistence, while demographic characteristics including gender and age acted as mediators between the independent variables.

Motivation and self-concept scores were compared between genders with *t*-tests. Hierarchical logistic regression was used to test the motivation and self-concept scores as predictors of attrition (dropped out vs remained enrolled), first with the variables alone, then with all other factors added.

Results

The final sample consisted of 339 students across the two recruiting periods (Cohort 1 $n = 110$, Cohort 2 $n = 129$). The gender balance reflected the overrepresentation of females in the student population, with 226 females and 110 males, and 3 others. The mean age was 23 years ($SD = 6.58$), with a median of 20.

Gender and Motivational Style

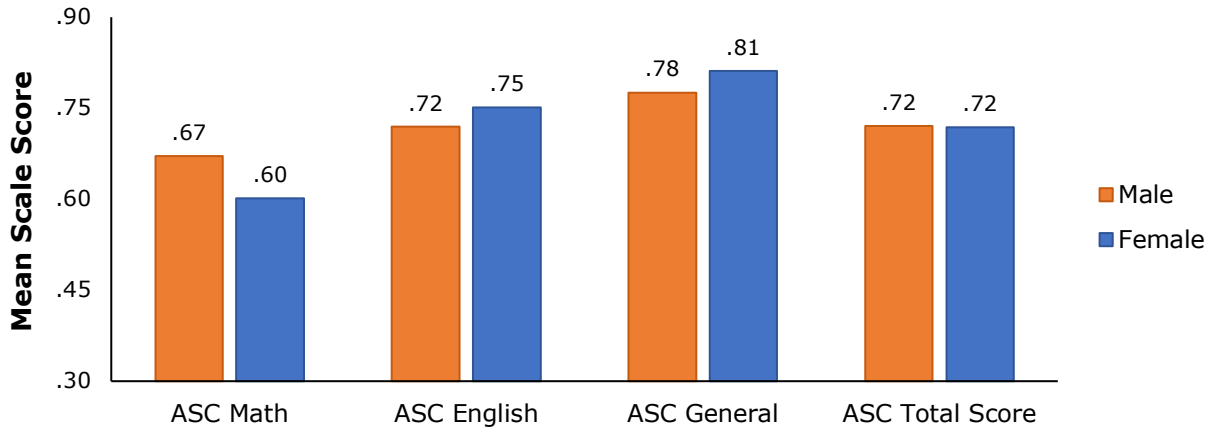
Integrative MS did not significantly differ by gender, $t(294) = 1.772$, $p = .077$, nor did instrumental MS, $t(294) = -1.229$, $p = .220$.

Gender and Academic Self-Concept

For ASC, overall score as well as the English subscale did not differ by gender. But for the Math subscale, males had significantly higher scores than females, $t(313) = 2.484$, $p = .014$, while females had higher scores on the General subscale, $t(313) = -2.113$, $p = .035$ (Figure 1).

Figure 1

Academic Self-Concept Scores by Gender



Attrition Rates

Overall, 62 of 339 (18.3%) students dropped out by the end of their 2nd semester. First semester attrition made up 34 of these (10%), and 28 of the remaining 277 (9.2%) dropped out during or immediately after the 2nd semester.

Academic Self-Concept and Attrition

Academic self-concept had a significant zero-order association with 1st semester attrition, with higher score predicting better persistence, χ^2 (1, N = 318) = 6.489, p = .011, but not with 2nd semester attrition.

When controlling for MS and gender with the hierarchical regression, ASC score resulted in a significant model improvement in Step 2, χ^2 (1) = 4.084, p = .043 (See Table 1).

Table 1

Hierarchical Logistic Regression of ASC Association with 1st Semester Attrition

Overall Model			Coefficients	*B*	S.E.	Wald	Exp(*B*)	Sig.
Step 1	Cox & Snell	.008	Integrative MS	1.253	1.789	.491	3.502	.484
	Nagelkerke R^2	.015	Instrumental MS	.462	2.084	.049	1.587	.825
	Sig.	.519	Gender	.497	.434	1.314	1.644	.252
			Constant	-3.665	1.087	11.380	.026	.001*
Step 2	Cox & Snell R^2	.210	Integrative MS	.248	1.885	.017	1.281	.895
	Nagelkerke R^2	.430	Instrumental MS	.505	2.157	.055	1.658	.815
	Sig.	.174	Gender	.465	.435	1.140	1.592	.286
	Step Sig.	*.043*	*ASC score*	*-3.109*	*1.551*	*4.019*	*.045*	*.045**
			Constant	-1.035	1.671	.383	.355	.536

Note. *$p < .05$

Instrumental Motivational Style and Attrition

Instrumental MS did not correlate with 1st semester attrition by itself, nor when controlling for ASC score and gender in step 2 of the hierarchical model. It did however have a marginally significant zero-order association with 2nd semester attrition, χ^2 (1, N = 267) = 3.643, p = .056. And when controlling for gender and ASC score in the hierarchical model, step 2 also showed a marginally significant improvement, χ^2 (1, N = 266) = 2.985, p = .084.

But while instrumental MS score as an individual predictor was also marginally significant, χ^2 (1, N = 266) = 3.138, p = .076, the model itself was not a significant predictor with all three variables included, χ^2 (3, N = 266) = 6.141, p = .105.

Integrative Motivational Style and Attrition

Integrative MS score had no zero-order association with 1st semester attrition, nor any step 2 model improvement. It did however have a zero-order association with 2nd semester attrition, χ^2 (1, N = 267) = 7.868, p = .005, and significantly improved the hierarchical model in Step 2 with ASC score and gender, χ^2 (1, N = 266) = 5.21, p = .022 (See Table 2).

Table 2.

Hierarchical Logistic Regression of MS Association with 2nd Semester Attrition

Overall Model			Coefficients	B	S.E.	Wald	Exp(B)	Sig.
Step 1	Cox & Snell R^2	.012	Gender	-.549	.442	1.542	.578	.214
	Nagelkerke R^2	.027	ASC score	-2.191	1.714	1.636	.112	.201
	Sig.	.206	Constant	.090	1.399	.004	1.095	.948
Step 2 - Integrative	Cox & Snell R^2	.031	Gender	-.384	.456	.706	.681	.401
	Nagelkerke R^2	.070	ASC score	-.984	1.794	.301	.578	.583
	Sig.	.039	*Integrative MS*	*3.739*	*1.626*	*5.288*	*42.076*	*.021**
	Step Sig.	*.022*	Constant	-2.674	1.911	1.957	.069	.162
Step 2 - Instrumental	Cox & Snell R^2	.023	Gender	-.578	.445	1.690	.561	.194
	Nagelkerke R^2	.051	ASC score	-1.792	1.702	1.109	.167	.292
	Sig.	.105	*Instrumental MS*	*3.276*	*1.849*	*3.138*	*26.475*	*.076*
	Step Sig.	*.084*	Constant	-1.311	1.612	.661	.416	.270

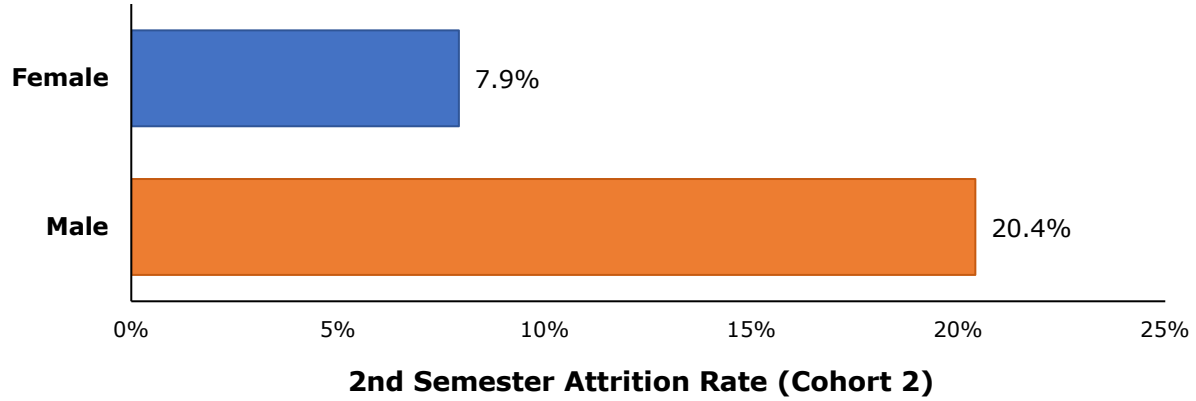
Note. * $p < .05$

Gender and Attrition

There was no difference in 1st semester attrition rate between genders, χ^2 (1, N = 336) = 1.199, p = .273. But when only including Cohort 2 students, there was: males had significantly higher 2nd semester attrition (20.4%) than females (7.9%), χ^2 (1, N = 150) = 4.872, p = .027 (Figure 2).

Figure 2

Second Semester Attrition Rate by Gender for Cohort 2 Students



Discussion

This study contributes to the literature on student attrition in a community college setting as it relates to motivation and academic self-concept, building on the work of Tinto (1975), Spady (1970), and Bean and Metzner (1985).

The first two hypotheses were that integrative and instrumental MS scores would differ by gender. The results did not support these hypotheses, having found no gender difference in either integrative or instrumental MS scores. This finding is in line with several previous studies (Turhan, 2020; Khong et al., 2017), but is is inconsistent with the findings of Zangeneh (2015) and Gardner et al. (2004), who found a gender difference in motivational style.

The results of the logistic regression analyses found that ASC and MS were predictive of student retention/attrition. Previous studies (e.g., Runner-Rioux et al., 2018) found ASC to be predictive of academic success, while others have demonstrated the role of motivation (e.g., Brubacher & Silinda, 2019). While ASC was found to be predictive of 1st semester attrition but not 2nd semester, for MS it was the reverse.

The results also indicate that both integrative and instrumental MS mediated some of the relationships between ASC and attrition/retention. This is consistent with the findings of Areepattamannil (2011) and Hammoudi (2019) that both intrinsic and extrinsic motivation were related to ASC. It can be argued that integrative and instrumental MS may not necessarily present opposite dimensions of motivation, and students might report both types of motivation (Ryan & Connell, 1989). Lepper et al. (2005) argued that the dimensions of intrinsic and extrinsic motivation may generally intersect where both types of motivation can be adaptive for them. While it appears that motivation functions as a mediator of academic success (and hence student retention), future studies should investigate this

relationship further.

One additional notable finding in this research is that both integrative and instrumental motivational orientation were at least marginally predictive of 2nd semester student attrition. Contrary to previous research, however, no evidence was found for any gender differences in motivational orientation.

Limitations

The first limitation is the use of self-report surveys for the motivation and self-concept measures. Self-report methods are not fundamentally inferior to behavioural or physiological measures (see Haeffel & Howard, 2010), but critics question their validity and reliability (see Fulmer & Frijters, 2009) because it can be susceptible to various confounds (Furnham, 1986). On the other hand, Huizinga and Elliott (1983) argue that self-repot measures meet the conventional social-science standards for quality data collection. Further, the retention data was objective institutional data, so this concern does not apply to that element of the results.

The second limitation is the use of a non-random convenience sample limiting generalizability. However, convenience sampling is a common and standard method in the social sciences (Jager et al., 2017), and the limitations are generally considered acceptable, and assumed as a given when interpreting the data. The sample size was also relatively small (n = 339), which could explain the failure to detect any gender differences in MS and ACS.

Conclusion

These findings provide evidence that academic self-concept is predictive of *first* semester attrition, while integrative motivational style, and to some extent instrumental, are predictive of *second* semester attrition. No difference was found in attrition rate between genders, contradicting many previous studies. To better understand the mediators of attrition/persistence among college students, replications and expansions of the current research are necessary.

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Declaration of conflict of interest
No conflict of interest.

Ethics Approval and informed consent

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants for being included in the study.

This study protocol was approved by the Research Ethics Board at Humber College and University of Southern Queensland.

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