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Growth Mindset and Academic Support as Predictors of Academic Motivation in Female First-Generation Students

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A B S T R A C T

Objective: The objective of this study was to examine how growth mindset and academic support predict academic motivation among female first-generation university students.

Methods and Materials: A correlational descriptive design was employed with 474 participants recruited from multiple Canadian universities. Each participant self-identified as female and first-generation, reporting on validated questionnaires that measured growth mindset, perceived academic support, and academic motivation. Data were analyzed using Pearson correlation and multiple linear regression in SPSS-27. Descriptive statistics, including means and standard deviations, were computed for all variables to determine overall trends in the sample. The assumptions for linear regression—linearity, multicollinearity, normality, and homoscedasticity—were confirmed prior to analysis. Ethical approval was obtained, and informed consent was collected from each participant.

Findings: Pearson correlation analyses revealed that both growth mindset ($r = .48$, $p < .01$) and academic support ($r = .56$, $p < .01$) had significant positive relationships with academic motivation. The multiple linear regression model was statistically significant, $F(2, 471) = 138.62$, $p < .001$, explaining 37% of the variance in academic motivation ($R^2 = .37$). Growth mindset ($\beta = .29$, $p < .001$) and academic support ($\beta = .38$, $p < .001$) emerged as significant predictors, indicating that higher levels of each factor were associated with greater academic motivation in this sample.

Conclusion: The findings underscore the pivotal role of both cognitive and contextual variables in predicting academic motivation among female first-generation students. Interventions that cultivate growth mindset beliefs and bolster academic support could have a substantial impact on enhancing motivation, ultimately promoting academic persistence and success within this demographic.

Keywords: *Growth mindset, Academic support, Academic motivation, First-generation students.*

1. Introduction

The concept of a growth mindset, popularized by Carol Dweck, refers to the belief that intelligence and abilities can be developed through effort, strategies, and constructive feedback. Individuals with a growth mindset tend to embrace challenges, persist in the face of setbacks, and view effort as a path to mastery. In contrast, a fixed mindset involves the belief that intelligence is static and unchangeable, often resulting in avoidance of challenges and a fear of failure (Kapasi & Pei, 2021; Krataytong & Saleemad, 2023). Numerous studies have illustrated that fostering a growth mindset can significantly enhance academic engagement, resilience, and performance (Calo et al., 2022; Stuart & Wolcott, 2021). For example, interventions targeting growth mindset beliefs have been associated with improved GPA, increased motivation, and greater satisfaction in academic settings (Fink et al., 2022; Mohamoud, 2024). In female students specifically, cultivating a growth mindset has been linked to better coping strategies and reduced academic stress, highlighting its potential to empower vulnerable student populations (Khilma & Utami, 2024; Supriyadi et al., 2023).

Moreover, the relevance of growth mindset to marginalized groups, including first-generation students, has drawn increasing scholarly attention. Research has shown that mindset interventions can be particularly effective among students who lack traditional forms of academic capital, helping to level the playing field and promote educational equity (Betanzos et al., 2024; Wang, 2024). Growth mindset not only influences cognitive engagement but also correlates with key emotional and behavioral constructs such as grit, resilience, and academic buoyancy (Aransado & Prudente, 2024; Gray et al., 2022; Valdez, 2023). These interrelationships highlight the multifaceted impact of growth mindset beliefs and underscore the importance of examining their predictive value for academic motivation among underrepresented students in higher education.

In addition to individual cognitive beliefs, the role of contextual support systems cannot be overstated in shaping academic motivation. Academic support refers to the perceived availability and quality of assistance students receive from various sources, including instructors, peers, family members, and institutional resources. It encompasses both instrumental support—such as tutoring and access to learning materials—and emotional support, including encouragement and recognition of effort (Vestad & Bru, 2023; Zhang et al., 2024). Academic support has been consistently linked to higher levels of academic engagement, self-efficacy, and persistence. When students perceive that their academic environment is supportive, they are more likely to adopt adaptive learning strategies, engage in help-seeking behavior, and maintain motivation in the face of obstacles (Kroeper et al., 2022; Zhao et al., 2023).

First-generation students, in particular, benefit profoundly from academic support networks due to the absence of familial experience in navigating academic systems. The lack of parental guidance on higher education expectations, academic norms, and institutional processes often places these students at a disadvantage (Meng et al., 2024). Academic support thus acts as a compensatory mechanism, fostering a sense of belonging and reinforcing the value of academic effort. Female first-generation students may face additional cultural and gender-based barriers that impact their academic trajectory. In such cases, supportive relationships and affirming academic climates serve not only to bolster academic motivation but also to mitigate the psychological burden of marginalization (Demırdöğen & Lewis, 2023; Zhang et al., 2024).

Studies have further shown that academic support interacts with mindset beliefs, jointly influencing motivational outcomes. For instance, students who perceive strong support from teachers and mentors are more likely to internalize growth mindset messages and apply them effectively to their learning process (Goldhorn et al., 2023). This synergy between internal beliefs and external resources forms a foundation for adaptive motivation. In fact, models of academic success increasingly emphasize the interplay of individual dispositions and environmental factors, underscoring the necessity of multidimensional research approaches (Calo et al., 2022; Campbell et al., 2021). As a result, investigating the combined influence of growth mindset and academic support on motivation provides a more nuanced understanding of what drives academic persistence, especially in populations with limited access to traditional forms of academic socialization.

The academic experiences of female first-generation students also reflect broader systemic challenges, including socioeconomic disparities, cultural expectations, and limited access to mentorship. These challenges often contribute to lower retention and graduation rates among this demographic. However, existing evidence suggests that when such students are equipped with adaptive psychological frameworks—such as a belief in the malleability of intelligence—and embedded in supportive

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learning environments, they can thrive academically and develop high levels of intrinsic motivation (Alfonso Sophia Ana Jesusa et al., 2023; Sun et al., 2021). Given the intersectionality of gender, generational status, and educational opportunity, it is imperative to understand how cognitive and contextual resources converge to influence academic outcomes in this group.

Despite the promising findings in the literature, gaps remain in the empirical understanding of how growth mindset and academic support collectively predict academic motivation among female first-generation students. Much of the existing research has been conducted in primary and secondary education contexts or among general student populations, with limited focus on the unique challenges faced by this specific group in higher education (Mutluer & Altun, 2023; Sugiarti et al., 2024). Furthermore, many studies emphasize either psychological or environmental factors in isolation, failing to capture their interactive effects. The present study seeks to address these gaps by exploring how growth mindset and academic support independently and jointly predict academic motivation in a sample of female first-generation university students in Canada.

The theoretical foundation for this research is informed by the expectancy-value theory of motivation, which posits that individuals' motivation to engage in academic tasks is influenced by both their expectations of success and the value they place on the task. Within this framework, growth mindset can be conceptualized as influencing students' expectancy beliefs, while academic support contributes to their perceived value and utility of educational engagement. The interaction of these variables can significantly enhance students' sustained effort, goal orientation, and resilience in academic settings (Mohamoud, 2024; Zhang et al., 2024). This framework offers a comprehensive lens through which to analyze how both belief systems and environmental factors shape academic motivation.

In sum, this study aims to examine how growth mindset and academic support predict academic motivation among female first-generation university students.

2. Methods and Materials

2.1. Study design and Participant

This study adopted a correlational descriptive design to investigate the relationship between growth mindset, academic support, and academic motivation in female first-generation university students. The target population consisted of undergraduate students enrolled in public universities across Canada. A total of 474 participants were selected using a simple random sampling method, and the sample size was determined based on the Morgan and Krejcie sample size table for a known population size, ensuring adequate statistical power for correlational and regression analyses. All participants self-identified as female and reported being the first in their family to pursue higher education, satisfying the criteria for first-generation status.

2.2. Measures

2.2.1. Academic Motivation

The Academic Motivation Scale (AMS), developed by Vallerand et al. in 1992, is a widely used standardized instrument designed to assess academic motivation among students, grounded in self-determination theory. The scale comprises 28 items divided into seven subscales: three for intrinsic motivation (to know, to accomplish, and to experience stimulation), three for extrinsic motivation (external regulation, introjected regulation, and identified regulation), and one for amotivation. Each item is rated on a 7-point Likert scale ranging from 1 ("Does not correspond at all") to 7 ("Corresponds exactly"). Higher scores on each subscale reflect stronger endorsement of the respective motivational orientation. Numerous studies have supported the AMS's construct validity and internal consistency, with Cronbach's alpha coefficients typically exceeding 0.70, confirming its reliability across diverse educational and cultural contexts (Jehanghir et al., 2024; Meyer & Stutts, 2024).

2.2.2. Growth Mindset

To measure growth mindset, the Theories of Intelligence Scale developed by Dweck (1999) is commonly utilized, particularly the subscale assessing beliefs about the malleability of intelligence. This subscale includes 8 items rated on a 6-point Likert scale ranging from 1 ("Strongly disagree") to 6 ("Strongly agree"), where higher scores reflect a stronger endorsement of a fixed mindset, and reverse-scoring is applied to reflect a growth mindset orientation. The instrument is unidimensional, specifically targeting implicit theories about intelligence as either fixed or expandable. The scale has been validated in numerous studies involving student populations, with reported Cronbach's alpha values typically ranging from 0.80 to 0.85, indicating strong internal consistency and reliability. Its validity has also been confirmed through correlations with

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academic resilience, learning behaviors, and achievement outcomes (Bai & Wang, 2023; Chen et al., 2022; Khilma & Utami, 2024).

2.2.3. Perceived Academic Support

The Perceived Academic Support Scale (PASS), developed by Malecki and Demaray (2002), is a validated instrument used to assess students' perceptions of academic support received from significant sources such as teachers, peers, and family. The full version consists of 60 items across four subscales, but the academic support dimension specifically includes items relevant to perceived help with learning and encouragement in school contexts. Items are rated on a 6-point Likert scale ranging from 1 ("Never") to 6 ("Always"), with higher scores indicating greater perceived support. For studies focusing specifically on academic support, researchers often use the relevant 15-item subscale, which has demonstrated strong psychometric properties. The PASS has been shown to have high internal consistency (Cronbach's alpha values above 0.85) and robust construct validity, making it a reliable tool for assessing perceived support in academic environments (Barimani & Hashemi, 2021; Maleki, 2022; Somayeh & Neda, 2020).

2.3. Data Analysis

Data were analyzed using IBM SPSS version 27. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated to describe participant characteristics. Pearson correlation coefficients were computed to assess the strength and direction of the bivariate relationships between the dependent variable (academic motivation) and each independent variable (growth mindset and academic support). Additionally, standard multiple linear regression analysis was conducted to examine the combined predictive power of growth mindset and academic support on academic motivation. Prior to conducting the regression analysis, assumptions of linearity, normality, multicollinearity, homoscedasticity, and independence of residuals were assessed and met.

3. Findings and Results

Of the 474 participants included in the study, 196 (41.35%) were aged between 18 and 20 years, 178 (37.55%) were aged between 21 and 23 years, and 100 (21.10%) were aged 24 years or older. Regarding academic standing, 128 participants (27.00%) were in their first year, 142 (29.96%) in their second year, 113 (23.83%) in their third year, and 91 (19.20%) in their fourth year or higher. In terms of ethnic background, 224 students (47.26%) identified as White, 98 (20.68%) as South Asian, 76 (16.03%) as Black, 51 (10.76%) as East Asian, and 25 (5.27%) as other or mixed ethnicities. All participants confirmed that neither parent had completed post-secondary education, meeting the criteria for first-generation status.

Table 1

Descriptive Statistics for Study Variables

Variable	Mean (M)	Standard Deviation (SD)
Academic Motivation	5.38	0.64
Growth Mindset	4.92	0.71
Academic Support	5.45	0.59

The descriptive statistics in Table 1 indicate that participants reported high levels of academic motivation (M = 5.38, SD = 0.64), growth mindset (M = 4.92, SD = 0.71), and academic support (M = 5.45, SD = 0.59). The relatively low standard deviations across variables suggest moderate variability in the responses.

Prior to performing the multiple linear regression analysis, assumptions were tested and confirmed. The linearity assumption was verified by inspecting scatterplots, which showed a linear relationship between the dependent and independent variables. Normality of residuals was confirmed through the Shapiro-Wilk test (p = .168) and Q-Q plot inspection, suggesting no significant deviation from normality. Multicollinearity was ruled out, as the Variance Inflation Factor (VIF) values were 1.38 for growth mindset and 1.42 for academic support, both well below the cutoff of 10. Homoscedasticity was confirmed through visual inspection of the standardized residuals versus predicted values scatterplot, which showed a random and equal spread. Lastly, the Durbin-Watson statistic was 1.87, indicating no autocorrelation in the residuals and confirming the independence assumption.

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Table 2

Pearson Correlation Coefficients Between Variables

Variables	1	2	3
1. Academic Motivation	—		
2. Growth Mindset	.48** (p < .01)	—	
3. Academic Support	.56** (p < .01)	.39** (p < .01)	—

Table 2 shows that academic motivation was positively correlated with both growth mindset (r = .48, p < .01) and academic support (r = .56, p < .01). Growth mindset and academic support were also significantly correlated with each other (r = .39, p < .01), suggesting a moderate positive relationship among the predictors.

Table 3

ANOVA Summary for Regression Model Predicting Academic Motivation

Source	Sum of Squares	df	Mean Square	R	R^2	Adj. R^2	F	p
Regression	67.45	2	33.73	.61	.37	.36	138.62	< .001
Residual	114.76	471	0.24					
Total	182.21	473						

As shown in Table 3, the overall regression model was statistically significant, F(2, 471) = 138.62, p < .001, with an R^2 of .37, indicating that 37% of the variance in academic motivation was explained by growth mindset and academic support. The adjusted R^2 value of .36 suggests a stable model with strong explanatory power.

Table 4

Multiple Regression Coefficients for Predicting Academic Motivation

Predictor	B	SE	β	t	p
Constant	2.14	0.18	—	11.89	< .001
Growth Mindset	0.31	0.05	.29	6.20	< .001
Academic Support	0.42	0.06	.38	7.85	< .001

Table 4 presents the results of the multiple regression analysis. Both growth mindset (β = .29, t = 6.20, p < .001) and academic support (β = .38, t = 7.85, p < .001) were statistically significant predictors of academic motivation. The unstandardized coefficients indicate that for every one-unit increase in growth mindset, academic motivation increases by 0.31 units, and for each unit increase in academic support, academic motivation increases by 0.42 units, holding all else constant.

4. Discussion and Conclusion

The present study investigated the predictive roles of growth mindset and perceived academic support on academic motivation in a sample of 474 female first-generation university students in Canada. The findings revealed significant positive correlations between academic motivation and both independent variables—growth mindset and academic support. Furthermore, the multiple linear regression analysis indicated that both variables were significant predictors of academic motivation, collectively accounting for a substantial portion of the variance. These results highlight the importance of both individual cognitive beliefs and contextual resources in shaping motivational outcomes among underrepresented student populations.

The strong correlation between growth mindset and academic motivation aligns with prior research emphasizing the critical role of mindset beliefs in fostering goal-oriented behaviors and resilience in academic contexts. Students who view intelligence as malleable are more likely to persist through difficulties and interpret challenges as opportunities for growth, which in turn enhances their motivation to learn and succeed (Calo et al., 2022; Demırdöğen & Lewis, 2023). This is particularly relevant for first-generation students, who often face heightened academic pressures and limited support from family systems familiar with higher education structures. The current findings reinforce previous evidence

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suggesting that interventions targeting growth mindset can effectively promote academic engagement and persistence among students from marginalized backgrounds (Fink et al., 2022; Mohamoud, 2024). Moreover, the significant role of growth mindset in this study resonates with the research of Betanzos et al. (Betanzos et al., 2024), who found that students from disadvantaged demographics derived more benefits from mindset interventions compared to their more privileged peers.

The predictive role of academic support in academic motivation further underscores the foundational role of social and institutional resources in student success. Participants who reported higher levels of perceived support from instructors, peers, and academic services were significantly more motivated in their academic pursuits. This is consistent with the findings of Vestad and Bru (Vestad & Bru, 2023), who demonstrated that supportive educational environments foster students' internal motivation by reinforcing their sense of belonging and capability. Similarly, Zhao et al. (Zhao et al., 2023) found that early academic support, particularly from teachers, was instrumental in helping students reframe academic failure and regain motivation. In the context of female first-generation students, the absence of parental academic modeling makes institutional and peer-based support even more vital, as these external sources provide scaffolding for academic navigation and identity development (Meng et al., 2024; Zhang et al., 2024).

Notably, the results also suggested that growth mindset and academic support function not in isolation but rather as complementary mechanisms enhancing academic motivation. This interaction aligns with theoretical propositions that students' beliefs about their learning capacities are reinforced through social affirmation and constructive feedback (Kapasi & Pei, 2021; Kroeper et al., 2022). For example, a student who believes she can improve her academic abilities through effort is more likely to benefit from support structures that validate and encourage such beliefs. This dynamic was previously supported by the work of Aransado and Prudente (Aransado & Prudente, 2024), who observed that students with a strong growth mindset and robust academic support reported higher levels of perseverance and task engagement. These dual influences offer a more comprehensive understanding of the motivational architecture in educational settings, especially for students navigating multiple identity-based barriers.

The contextual specificity of this study also adds valuable insight to the international literature on academic motivation. In the Canadian higher education landscape, efforts to widen participation and support diversity have increasingly emphasized the importance of inclusive pedagogy and student-centered support services. The results of this study align with those of Sun et al. (Sun et al., 2021), who noted that culturally responsive educational systems can enhance the motivational trajectories of students from diverse backgrounds when combined with psychologically empowering frameworks like the growth mindset. Furthermore, the intersectionality of gender and first-generation status explored in this study is an important contribution to the literature, as it addresses an often-overlooked subgroup in academic motivation research. Findings from Wang (Wang, 2024) also support the view that mindset interventions yield nuanced effects depending on students' backgrounds, gender, and institutional context.

Additionally, the study's results contribute to the growing body of literature that connects mindset theory with motivational and affective outcomes in higher education. Campbell et al. (Campbell et al., 2021) emphasized that mindset beliefs are most effective when integrated into supportive learning environments—a condition confirmed by the present study's dual-variable model. The reciprocal reinforcement between cognitive beliefs and environmental validation creates a self-sustaining motivational loop, particularly potent in populations such as female first-generation students who may lack traditional forms of academic social capital (Supriyadi et al., 2023; Valdez, 2023). Furthermore, the findings are consistent with the recent bibliometric review by Sugiarti et al. (Sugiarti et al., 2024), which identified growth mindset and academic support as two of the most frequently cited predictors of educational resilience during and after the COVID-19 pandemic.

Despite these affirming patterns, it is also worth noting that the strength of the correlation and predictive power of academic support was slightly higher than that of growth mindset in this study. This might indicate that while internal beliefs are powerful motivators, they are most effective when embedded within a tangible support structure. Research by Gray et al. (Gray et al., 2022) and Goldhorn et al. (Goldhorn et al., 2023) similarly indicated that growth mindset beliefs alone may not lead to significant motivational outcomes unless reinforced through interaction with supportive peers and educators. Thus, institutional policies and pedagogical practices must consider this interdependence when designing student success interventions.

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The findings of this study also resonate with the outcomes of Stuart and Wolcott (Stuart & Wolcott, 2021), who implemented a semester-long mindset intervention and observed enhanced academic success only among students who also reported strong perceived support from faculty. Similarly, Alfonso Sophia Ana Jesusa et al. (Alfonso Sophia Ana Jesusa et al., 2023) documented that the highest levels of academic motivation occurred in students with both high growth mindset scores and high perceived support, further confirming the significance of dual predictors. Taken together, the convergence of these studies reinforces the reliability of the present study's findings and points to the synergistic role of personal and environmental factors in fostering academic motivation.

5. Limitations and Suggestions

While the study provides meaningful insights, several limitations should be acknowledged. First, the use of self-report questionnaires introduces potential biases related to social desirability and self-perception, which may not accurately reflect actual behaviors or attitudes. Second, the study utilized a cross-sectional design, which limits the ability to draw causal inferences between the variables. Longitudinal studies would offer a more robust understanding of how growth mindset and academic support influence motivation over time. Third, the sample consisted exclusively of female first-generation students from Canadian universities, which, while intentional, limits the generalizability of the findings to other genders, cultural contexts, and educational systems. Additionally, the reliance on a single national sample may not capture regional or institutional differences in academic support structures. Finally, while the instruments used were standardized and validated, cultural nuances in interpreting items related to mindset and support may have influenced responses in ways not fully captured by the analysis.

Future research should consider employing longitudinal or experimental designs to explore the causal relationships between growth mindset, academic support, and academic motivation. Intervention-based studies could test the efficacy of combined programs that simultaneously cultivate growth mindset beliefs and enhance academic support systems. Moreover, expanding the demographic scope to include male students, students from other marginalized groups, and those in international contexts would increase the generalizability of findings. Qualitative research, including interviews and focus groups, could also provide deeper insights into how students interpret and internalize support and mindset messages. Additionally, examining the mediating or moderating roles of variables such as self-efficacy, emotional regulation, and cultural identity would offer a more comprehensive understanding of the psychological mechanisms underlying academic motivation.

Educators and university administrators should consider implementing integrated support systems that combine academic skill development with growth mindset training, particularly targeted at first-generation students. Faculty development programs should train instructors to communicate growth-oriented messages and create affirming academic climates. Peer mentoring programs and structured support networks can provide accessible pathways for academic and emotional assistance. Institutions should also ensure that academic support services are culturally sensitive and gender-responsive to better serve diverse student populations. Finally, embedding growth mindset language and principles into curricula and advising practices can normalize the view of intelligence as developable, reinforcing persistence and motivation in students navigating the challenges of higher education.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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