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Academic Motivation and Self-Regulated Learning Among University Students

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ABSTRACT

This study investigates the relationship between academic motivation and self-regulated learning strategies among university students in Canada, examining how different motivational orientations influence students' capacity to manage their learning processes effectively. Utilizing a comprehensive survey design with 680 undergraduate students from eight Canadian universities across diverse disciplines and academic levels, this research explores patterns of intrinsic and extrinsic motivation, autonomous and controlled regulation, and their associations with metacognitive, cognitive, and resource management strategies. Data analysis employed structural equation modeling to test theoretical relationships between motivation constructs and self-regulation dimensions while controlling for demographic and contextual variables. Findings reveal significant positive associations between autonomous forms of motivation and sophisticated self-regulated learning strategies, with intrinsic motivation showing particularly strong relationships with metacognitive regulation and deep processing approaches. Conversely, controlled motivation and amotivation correlated with surface learning approaches and reduced self-regulatory capacity. Mediating analyses indicate that perceived academic autonomy and competence partially mediate motivation-regulation relationships. This research contributes empirical evidence

supporting self-determination theory applications in higher education contexts while providing practical implications for instructional design and student support services.

INTRODUCTION

Academic success in higher education increasingly depends not merely on cognitive ability or prior knowledge but on students' capacity to actively manage their own learning processes through self-regulated learning strategies. University environments differ fundamentally from secondary education contexts, typically providing greater autonomy, reduced external structure, and increased expectations for independent learning that challenge many students unprepared for these demands. Self-regulated learning encompasses the metacognitive, motivational, and behavioral processes through which students actively direct their learning, including goal-setting, strategy selection, progress monitoring, and adaptive adjustments when difficulties arise (Mulyana et al., 2021). According to Zimmerman (2002), self-regulated learners approach academic tasks proactively rather than reactively, demonstrating awareness of their strengths and limitations, strategic knowledge about learning processes, and intrinsic motivation sustaining effort despite obstacles or competing demands.

Motivation represents a critical foundation for self-regulated learning, providing the energizing and directional forces that initiate learning activities, sustain engagement through challenges, and influence which regulatory strategies students employ (Ibrahim, 2020). However, not all forms of motivation equally support self-regulation, with substantial research distinguishing between autonomous motivation driven by interest, enjoyment, or personal values versus controlled motivation originating from external pressures, expectations, or contingencies (Muhsyanur and Mustapha, 2023). Ryan and Deci (2020) articulate through self-determination theory that autonomous motivation facilitates deeper cognitive engagement, greater persistence, enhanced well-being, and more sophisticated learning strategies compared to controlled motivation, which may generate short-term compliance but undermines long-term learning quality and psychological health. Understanding these motivational dynamics becomes particularly important in higher education where students face numerous competing demands and must sustain engagement across extended timeframes with limited external monitoring.

Canadian higher education presents a distinctive context for examining motivation and self-regulation relationships due to its diverse student population, institutional variety, and particular challenges facing contemporary university students (Muhsyanur, 2024b; Santalia et al., 2025). Canadian universities enroll substantial proportions of international students, first-generation students, and

learners balancing academic responsibilities with employment and family obligations, creating heterogeneous student bodies with varying preparedness for university-level independent learning (Muhsyanur et al., 2021). Perry et al. (2019) describe how Canadian universities simultaneously maintain rigorous academic standards while expanding access to diverse populations, creating contexts where self-regulated learning skills become essential for success yet cannot be assumed as uniformly developed among entering students. Economic pressures leading many students to work substantial hours alongside studying, mental health challenges affecting increasing proportions of students, and transition difficulties particularly for first-year students compound the importance of understanding factors supporting effective self-regulation.

Theoretical frameworks examining motivation-regulation relationships draw primarily from self-determination theory and social-cognitive perspectives on self-regulated learning. Self-determination theory proposes that autonomous motivation emerges when three fundamental psychological needs are satisfied: autonomy (experiencing choice and volition), competence (feeling effective), and relatedness (experiencing connection with others). Pintrich (2004) integrates motivational and cognitive perspectives (Muhsyanur, 2024a), proposing that self-regulated learning involves dynamic interactions between motivational beliefs including self-efficacy, task value, and goal orientation alongside metacognitive and cognitive strategies. These frameworks suggest that educational environments supporting psychological needs facilitate autonomous motivation, which in turn promotes sophisticated self-regulatory processes including metacognitive monitoring, deep cognitive processing, and persistent effort regulation.

Despite extensive research examining motivation and self-regulation independently, empirical investigations of their interrelationships in specific higher education contexts remain limited, with most existing studies conducted in controlled laboratory settings or focusing on particular courses rather than examining patterns across students' overall academic experiences. Furthermore, while theoretical frameworks propose specific relationships between motivational orientations and regulatory strategies, empirical evidence testing these propositions shows inconsistent patterns across studies, suggesting potential moderating influences of contextual or individual difference factors. Broadbent and Poon (2015) note methodological limitations in much existing research including reliance on self-report measures susceptible to bias, cross-sectional designs limiting causal inference, and failure to account for disciplinary or cultural contexts that may influence motivation-regulation relationships.

This study addresses gaps in existing literature by systematically examining relationships between multiple dimensions of academic motivation and various self-regulated learning strategies among a diverse sample of Canadian university students, investigating how motivational orientations relate to metacognitive, cognitive, and resource management aspects of self-regulation, and exploring whether these relationships vary across student characteristics or academic contexts.

Research questions guiding this investigation include: What relationships exist between different forms of academic motivation and self-regulated learning strategies among Canadian university students? How do intrinsic, extrinsic, and amotivation relate to metacognitive regulation, cognitive strategies, and resource management? What individual or contextual factors moderate motivation-regulation relationships? According to Schunk and Greene (2018), answering these questions requires comprehensive assessment of motivational constructs alongside detailed measurement of self-regulatory processes, examining relationships while accounting for relevant covariates and potential mediating mechanisms.

METHODE

This research employed a cross-sectional survey design to examine relationships between academic motivation and self-regulated learning among Canadian university students, with data collected through online questionnaires administered during the 2023-2024 academic year. The sample comprised 680 undergraduate students from eight universities representing diverse institutional types (research-intensive, comprehensive, primarily undergraduate), geographic regions (Atlantic, Quebec, Ontario, Western, British Columbia), and program areas across humanities, social sciences, natural sciences, engineering, and professional programs. Participants ranged from first-year through fourth-year students, with deliberate oversampling of first-year students (n=220) given their particular relevance for understanding academic transitions. Recruitment occurred through course announcements, student services communications, and snowball sampling, with participation incentivized through entry into prize drawings for gift cards. The survey instrument integrated validated scales including the Academic Motivation Scale measuring intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation based on self-determination theory; the Motivated Strategies for Learning Questionnaire assessing metacognitive self-regulation, cognitive strategies, and resource management; and demographic questions capturing student characteristics including year of study, program area, employment hours, living arrangements, first-generation status, and international versus domestic student status. Reliability analysis of scales in the current sample yielded Cronbach's alpha coefficients ranging from 0.79 to 0.94, indicating acceptable to excellent internal consistency.

Data analysis proceeded through multiple phases beginning with descriptive statistics and correlation analyses examining bivariate relationships between motivation and self-regulation variables, followed by structural equation modeling testing theoretically-derived models of motivation-regulation relationships while controlling for relevant covariates. Confirmatory factor analysis first established measurement models for motivation and self-regulation constructs before examining structural relationships between latent variables. Mediation analyses investigated whether psychological need satisfaction and perceived competence mediated relationships between contextual factors and motivational orientations. Multi-group

analyses tested whether motivation-regulation relationships varied across student subgroups defined by year of study, program area, or demographic characteristics. Missing data, present for fewer than 5% of responses on any variable, were handled through full information maximum likelihood estimation. Model fit evaluation employed multiple indices including chi-square statistics, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), with acceptable fit indicated by CFI and TLI above 0.90, RMSEA below 0.08, and SRMR below 0.08. Ethical approval was obtained from research ethics boards at all participating institutions, with informed consent obtained from all participants and confidentiality protections implemented throughout data collection and analysis. Limitations include reliance on self-report measures potentially subject to social desirability bias or limited self-awareness, cross-sectional design precluding definitive causal claims, and potential self-selection bias as more motivated students may have been more likely to participate.

RESULT AND DISCUSSION

Motivational Profiles and Self-Regulated Learning Patterns

Descriptive analysis reveals considerable variability in motivational orientations among Canadian university students, with most participants reporting moderate to high levels of identified regulation (M = 5.8, SD = 1.2 on 7-point scale) and intrinsic motivation (M = 5.1, SD = 1.4), suggesting that many students experience their studies as personally meaningful and inherently interesting. External regulation showed lower mean levels (M = 4.3, SD = 1.5), while introjected regulation fell in the middle range (M = 4.9, SD = 1.6). Approximately 15% of participants scored above the midpoint on amotivation, indicating a concerning subset of students who question the value of their studies and lack clear reasons for pursuing their degrees. Cluster analysis identified four distinct motivational profiles: autonomous learners (32%) characterized by high intrinsic motivation and identified regulation with low controlled motivation, externally driven students (23%) showing high external regulation and low autonomous motivation, mixed motivation students (28%) with elevated scores across multiple motivation types, and amotivated students (17%) with low scores across all motivation forms except amotivation.

Self-regulated learning strategy use varied substantially across these motivational profiles in theoretically consistent patterns. Autonomous learners reported significantly higher use of metacognitive strategies including planning, monitoring, and regulating cognition (M = 5.6, SD = 0.9) compared to all other groups ($p < 0.001$, $\eta^2 = 0.24$). They also showed greater employment of deep cognitive processing strategies such as elaboration and critical thinking (M = 5.4, SD = 1.0) and more effective resource management including time management and help-seeking (M = 5.2, SD = 1.1). Externally driven students demonstrated moderate strategy use overall but showed particular reliance on rehearsal and surface

processing approaches. Mixed motivation students exhibited inconsistent strategy patterns, sometimes employing sophisticated approaches but struggling with sustained effort regulation. Amotivated students reported significantly lower use of all self-regulatory strategies, particularly metacognitive regulation and effort management.

Qualitative comments provided by survey participants who opted to elaborate on their motivational experiences illuminate these statistical patterns and reveal the subjective experiences underlying different motivational orientations. Autonomous learners frequently described genuine intellectual curiosity, enjoyment of learning processes, and connections between their studies and personal goals or values. Representative comments included "I genuinely love what I'm studying and want to understand deeply" and "My courses relate directly to the career I'm passionate about pursuing." Externally driven students more often referenced parental expectations, credential requirements, or avoidance of negative consequences: "I need good grades to keep my scholarship" or "My parents expect me to get a degree." Amotivated students expressed uncertainty about their academic direction and questioned whether university represented the right path: "I'm not sure why I'm here or what I'm working toward." These qualitative insights suggest that motivational orientations reflect not merely intensity of motivation but fundamentally different relationships students have with their academic work.

Structural Relationships Between Motivation and Self-Regulation

Structural equation modeling analysis reveals significant positive relationships between autonomous forms of motivation and multiple dimensions of self-regulated learning, with intrinsic motivation showing particularly strong associations. The standardized path coefficient from intrinsic motivation to metacognitive self-regulation reached 0.52 ($p < 0.001$), indicating that students experiencing genuine interest and enjoyment in their studies demonstrate substantially more sophisticated metacognitive awareness and regulation. Intrinsic motivation also predicted deep cognitive processing ($\beta = 0.48$, $p < 0.001$) and effective resource management ($\beta = 0.41$, $p < 0.001$). Identified regulation, representing engagement based on personal value and goal alignment, showed similar though slightly weaker patterns with path coefficients ranging from 0.38 to 0.45 across self-regulation dimensions (all $p < 0.001$).

Controlled forms of motivation demonstrated more complex relationships with self-regulated learning strategies. External regulation showed near-zero or weakly negative associations with metacognitive regulation ($\beta = -0.08$, $p = 0.14$) and deep processing ($\beta = -0.12$, $p < 0.05$) but positive relationships with rehearsal strategies ($\beta = 0.28$, $p < 0.001$), suggesting that externally motivated students may employ surface-level strategies focused on immediate task completion rather than deep understanding. Introjected regulation, reflecting internalized pressures and ego involvement, showed positive associations with effort regulation ($\beta = 0.31$, $p < 0.001$), perhaps reflecting anxiety-driven persistence, but negative relationships with help-seeking ($\beta = -0.19$, $p < 0.01$), potentially indicating reluctance to reveal

difficulties that might threaten self-esteem. Amotivation demonstrated consistent negative associations with all self-regulation dimensions, with the strongest negative relationships appearing for effort regulation ($\beta = -0.44$, $p < 0.001$) and time management ($\beta = -0.39$, $p < 0.001$).

Model fit indices indicated acceptable fit of the proposed structural model to the observed data: $\chi^2(324) = 567.3$, $p < 0.001$; CFI = 0.93; TLI = 0.91; RMSEA = 0.04 (90% CI [0.03, 0.05]); SRMR = 0.06. The model explained substantial variance in self-regulation outcomes, with R^2 values of 0.48 for metacognitive regulation, 0.41 for deep cognitive processing, 0.35 for effort regulation, and 0.29 for resource management. These findings provide strong empirical support for theoretical propositions that autonomous motivation facilitates self-regulated learning while controlled motivation and amotivation undermine it. However, mediation analyses revealed important nuances, with perceived competence partially mediating relationships between intrinsic motivation and metacognitive regulation (indirect effect = 0.18, 95% CI [0.12, 0.25]), suggesting that motivation enhances self-regulation partly through increasing students' confidence in their learning capabilities.

Contextual and Individual Difference Moderators

Multi-group analyses examining whether motivation-regulation relationships varied across student subgroups revealed several noteworthy moderating influences. Year of study emerged as a significant moderator, with motivation-regulation relationships strengthening progressively from first year through fourth year. Among first-year students, the path from intrinsic motivation to metacognitive regulation reached $\beta = 0.38$ ($p < 0.001$), increasing to $\beta = 0.49$ for second-year, $\beta = 0.56$ for third-year, and $\beta = 0.61$ for fourth-year students (χ^2 difference test for equality constraints: $\Delta\chi^2(3) = 18.7$, $p < 0.001$). This pattern suggests that either students develop stronger connections between motivation and self-regulation over time, or that students who fail to develop such connections disproportionately leave university, creating survivor effects in upper years (Kartini and Muhsyanur, 2025).

Disciplinary context also moderated motivation-regulation relationships in domain-specific patterns. STEM students (science, technology, engineering, mathematics) showed stronger relationships between identified regulation and deep processing strategies ($\beta = 0.52$) compared to humanities and social science students ($\beta = 0.38$), potentially reflecting STEM disciplines' emphasis on problem-solving requiring sustained cognitive effort and strategic approach selection. Conversely, humanities students demonstrated stronger associations between intrinsic motivation and critical thinking strategies ($\beta = 0.56$ vs. $\beta = 0.41$ for STEM), possibly reflecting humanities pedagogy emphasizing interpretive analysis and argumentation. Professional program students (business, education, nursing) showed particularly strong links between identified regulation and time management ($\beta = 0.49$), perhaps due to these programs' explicit career preparation focus creating clear connections between current studies and future goals.

Employment hours represented another significant contextual moderator influencing motivation-regulation patterns. Students working fewer than 10 hours weekly showed positive relationships between autonomous motivation and all self-regulation dimensions. However, for students working 20+ hours weekly, these relationships weakened substantially, with paths from intrinsic motivation to metacognitive regulation declining from $\beta = 0.54$ for low-employment students to $\beta = 0.31$ for high-employment students ($\Delta\chi^2(1) = 12.4$, $p < 0.001$). Qualitative comments from heavily employed students revealed time constraints forcing reliance on efficiency-focused strategies even when students felt intrinsically motivated: "I love my courses but barely have time to do more than the minimum required given my work schedule." These findings highlight how structural constraints can disrupt otherwise positive motivation-regulation relationships, suggesting that individual motivational interventions may prove insufficient without addressing contextual barriers to self-regulated learning.

Academic Motivation and Self-Regulated Learning Strategy Use

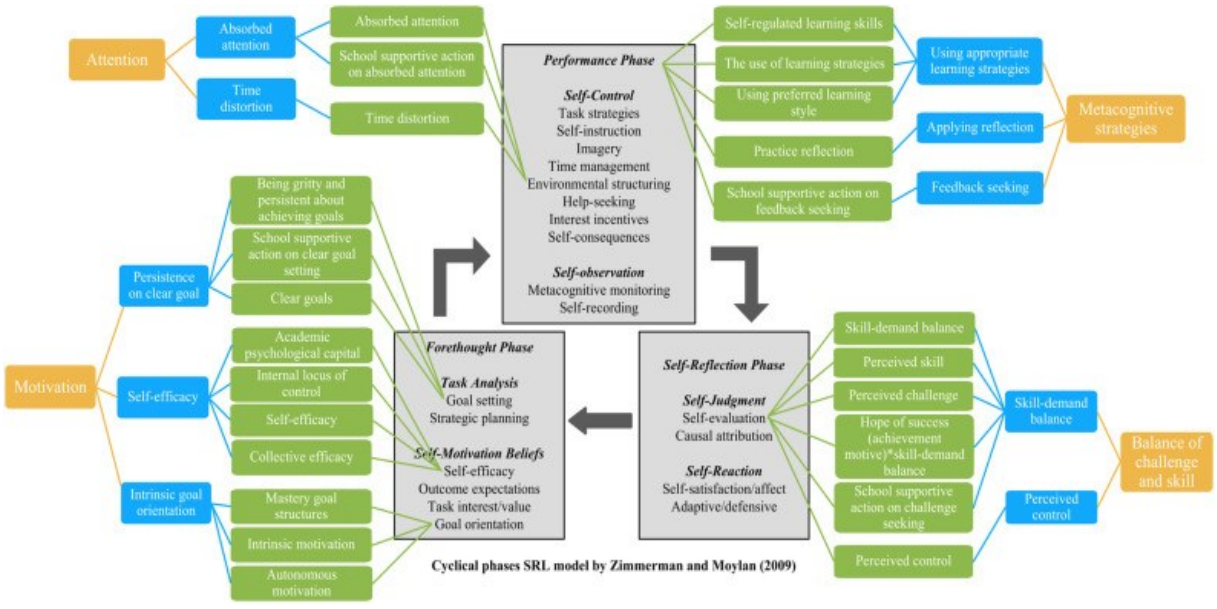

Figure 1. Standardized Path Coefficients: Academic Motivation → Self-Regulated Learning Strategies (N=680)

Note. Positive values indicate positive relationships; negative values indicate inverse relationships.
***p < 0.001, **p < 0.01, *p < 0.05. Model fit indices: CFI = 0.93, TLI = 0.91, RMSEA = 0.04, SRMR = 0.06.

CONCLUSION

This study demonstrates that academic motivation significantly influences self-regulated learning among Canadian university students, with autonomous forms of motivation including intrinsic motivation and identified regulation showing strong positive associations with sophisticated metacognitive, cognitive, and resource management strategies, while controlled motivation and amotivation correlate with surface learning approaches and reduced self-regulatory capacity, though these relationships are moderated by contextual factors including year of study, disciplinary context, and employment demands. Findings provide empirical support for self-determination theory's application to higher education while revealing important nuances including the partial mediating role of perceived competence, differential patterns across academic disciplines, and contextual constraints that can disrupt otherwise positive motivation-regulation relationships.

Based on these findings, recommendations for educational practice include designing learning environments that support psychological needs for autonomy, competence, and relatedness through providing meaningful choices, optimal challenges with appropriate support, and collaborative learning opportunities; implementing explicit instruction in self-regulated learning strategies rather than assuming students enter university with well-developed self-regulatory skills, particularly targeting first-year students and those showing controlled motivation or amotivation patterns; helping students develop connections between their studies and personal interests, values, or goals to facilitate identified regulation when intrinsic interest proves difficult to cultivate; providing academic advising that addresses motivational dimensions alongside course selection and career planning, recognizing that motivation represents a legitimate target for educational intervention; creating flexible learning structures that accommodate students balancing substantial employment with academic responsibilities, recognizing that time constraints can undermine even strong intrinsic motivation; developing early warning systems identifying students showing amotivation patterns for targeted intervention before academic difficulties compound; and fostering faculty awareness of how instructional practices including autonomy support, competence feedback, and relatedness cultivation influence student motivation and subsequent self-regulation.

Future research should employ longitudinal designs tracking motivation and self-regulation development over time, investigate whether motivation-focused interventions successfully enhance subsequent self-regulated learning, examine reciprocal relationships between self-regulation success and motivational development, explore how specific instructional practices influence student motivation and self-regulation in authentic classroom contexts, investigate cultural factors that may influence motivation-regulation relationships among international students, and examine how digital learning environments and emerging technologies might support or undermine autonomous motivation and self-regulated learning processes.

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