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Quantitative Article

Academic Adjustment and Academic Performance of Thai Undergraduates: The Moderated-mediating Roles of Motivation and Psychological Well-being

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Abstract

Background/problem: The higher education environment presents significant challenges for first year Thai undergraduates, with inadequate adjustment leading to academic difficulties and higher dropout rates. Current research focuses on negative psychological issues and outcomes, neglecting the crucial role of psychological well-being in enhancing adjustment and academic performance.

Objective/purpose: This study examined the role of psychological well-being as a moderator and motivation as a mediator in the relationship between academic adjustment and performance.

Design and Methodology: A quantitative online questionnaire was used to collect data from 572 first-year undergraduate students from a university in Thailand. Data analysis was conducted using Hayes's PROCESS macro for moderated-mediation analysis.

Results: The results indicate that positive extrinsic motivation significantly and partially mediates the relationship between academic adjustment and academic performance (β = .01, 95% CI = [.002, .03]). Conversely, negative amotivation also significantly and partially mediates this relationship (β = .01, 95% CI = [.002, .02]). Furthermore, moderated mediation analysis shows that psychological well-being significantly moderates the relationship between academic adjustment and academic performance when mediated by extrinsic motivation (β = .03, 95% CI = [.002, .06]).

Conclusion and Implications: This study recommends that educators integrate extrinsic motivation and psychological well-being into their pedagogies to promote academic adjustment and enhance academic performance.

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Originality/Value for the Sustainable Development Goals (SDGs)
This study offers valuable insights for improving educational practices and policies in line with SDG-4 (quality education) emphasizing quality and inclusivity. It highlights the significance of external rewards and psychological well-being in enhancing academic outcomes for first-year students. By promoting a supportive environment that integrates mental health services and reward systems, the research advocates for boosting extrinsic motivation and well-being, which are crucial for fostering lifelong learning and personal growth. The strategic use of external rewards also helps sustain engagement and improve academic performance by addressing students' need for connection and support.

The transition from secondary to higher education often presents students with heightened expectations and anxiety due to the substantial changes in their academic environment. The shift from secondary to higher education involves significant differences in both content and methodology. This

challenge has become even more pronounced in the aftermath of the COVID-19 pandemic, which has exacerbated psychological issues such as anxiety, depression, stress, and sleep disturbances. These issues have led to notable declines in both life satisfaction and academic performance (Li et al., 2023). Despite the benefits of a smooth transition, first-year university students continue to face high dropout rates. It is therefore crucial for educators to find effective strategies to support students through this transition. A critical factor in facilitating a successful transition is academic adjustment, which involves students effectively interacting with and adapting to the new academic environment (Baker & Siryk, 1989). Academic adjustment can be assessed through various dimensions, including motivation to learn, having clear academic goals, diligence in academic work, effort to meet academic demands, and satisfaction with the academic environment (Baker & Siryk, 1984). Research consistently shows that these aspects of academic adjustment significantly impact academic performance and achievement (Bailey & Phillips, 2015; Raza et al., 2021; Rodríguez et al., 2017, van Rooij et al., 2018).

In addition to this, Rodríguez et al. (2017) observed that the recognition of accomplishments and achievements significantly influences the transition process. Motivation, a crucial determinant of academic performance, such as grade point average (Gilar-Corbi et al., 2020), is often linked to the ability to adjust to the university environment (Baker, 2004). Self-determination theory (SDT) provides a framework for understanding motivation by differentiating between intrinsic and extrinsic types. Intrinsic motivation, characterized by a genuine interest in seeking challenges, exploring, and learning, is associated with more effective learning strategies, a preference for challenging tasks, increased enjoyment of classes, and sustained involvement (Bailey & Phillips, 2015; Meng & Hu, 2022; Raza et al., 2021; Ryan & Deci, 2017). In contrast, extrinsic motivation involves performing tasks to achieve external rewards or to avoid punishment (Ryan & Deci, 2017). While intrinsic motivation generally leads to greater engagement and better academic performance, the impact of extrinsic motivation on educational outcomes is complex and context-dependent (Bailey & Phillips, 2015; Meng & Hu, 2022). SDT also addresses amotivation, a state of lacking motivation, which is typically linked to poorer academic outcomes. This study aims to explore motivation as a mediating variable between academic adjustment and academic performance, proposing that motivation enhances engagement and thus academic achievement. Consequently, students who are both academically adjusted and possess intrinsic and extrinsic motivation are expected to exhibit higher academic performance compared to those who, despite being adjusted, lack sufficient motivation.

According to Bailey and Phillips (2015) also emphasize that psychological well-being is another important factor in academic adjustment and performance. Psychological well-being, often equated with life satisfaction or happiness, encompasses behavioral competencies, external contexts, beliefs, and overall satisfaction with life. It involves reflecting on one's circumstances and deriving satisfaction from emotional experiences such as relationships and support (Rodríguez et al., 2017). Research indicates that high life satisfaction enhances students' ability to experience positive emotions, which can improve academic motivation and performance. Conversely, low psychological well-being can lead to decreased interest and motivation, resulting in poor adjustment and academic performance (Chen et al., 2023). Therefore, students with high life satisfaction are better positioned to adjust their behaviours and improve their academic performance. Although research highlights the significant impact of motivation and psychological well-being on academic performance, there is a notable gap in studies exploring their intersection in the context of academic adjustment. For many Thai undergraduates, the first year of university introduces both opportunities and challenges. Common barriers include lack of motivation influenced by teaching methods, content difficulty, anxiety, fear of failure, and social challenges. These factors can lead to demotivation and dissatisfaction, complicating the adaptation process and potentially resulting in poor academic performance or dropout (Pusapanich et al., 2023). This study aims to address

this gap by investigating the moderating role of psychological well-being in the relationship between academic adjustment and academic performance, with motivation proposed as a mediating factor.

Literature Review

This section reviews pertinent literature and previous studies, examining the relationships among the study variables to develop the research hypotheses.

Academic Adjustment and Academic Performance

The student's academic performance is the outcome of their studying process and academic effort towards education. Academic achievement outcomes reflect the attainment of curricular goals and are primarily assessed using grade point systems (Vizoso et al., 2019). Most of the current studies use GPA as a scale to measure and evaluate student's academic performance in most educational institutes (Slavinski et al., 2021; Tatar & Düştegör, 2020). The GPA of students shows how well a student is performing, while several credit hours indicate the passing report of student's courses. Previous studies have shown the crucial role of student adjustment in projecting higher education achievement (Rodríguez et al., 2017). The successful interaction between a first-year student and the academic characteristics and demands of the university environment can be summarized by the construct of academic adjustment. Prior literature consistently shows the pivotal role of academic adjustment in predicting achievement (Bailey & Phillips, 2015; Raza et al., 2021; Rodríguez et al., 2017; van Rooij et al., 2018) in higher education. Moreover, van Rooij et al. (2018) concluded that academic adjustment plays an essential role in predicting GPA. Therefore, it is expected that students' academic adjustment reflects their academic performance and academic success. Thus, the following hypothesis was proposed.

H1: Academic adjustment will positively predict academic performance.

The Mediating Role of Motivation

Based on self-determination theory and previous research investigating the significance of academic adjustment as a key factor in first-year success, it is essential to identify which variables influence this adjustment. Manganelli et al. (2019) underscored the importance of integrating motivational factors and study skills in understanding academic achievement. This study builds on that perspective by exploring the various motivational influences on the relationship between academic adjustment and academic performance. Extensive literature and meta-analyses have consistently demonstrated a positive relationship between motivation and academic achievement (Gilar-Corbi et al., 2020; Manganelli et al., 2019; Richardson et al., 2012). For instance, a study involving first-year students in both Taiwan and America revealed that both intrinsic and extrinsic motivation serve as positive predictors of academic performance (Cheng, 2018). Additional investigations have examined the link between motivational factors and adjustment, finding a significant positive correlation between intrinsic motivation and successful academic adjustment (Girelli et al., 2018).

Baker and Siryk (1984) identified a correlation between achievement motivation and academic adjustment, while Baker (2004) found that intrinsic motivation was linked to lower stress levels and higher self-esteem, both of which contributed positively to academic performance. Students who perceived academic-related behaviours as intrinsically worthwhile demonstrated better adjustment to their educational environments. Conversely, findings indicated that only extrinsically regulated motivation significantly predicted academic performance, while amotivation was associated with poorer academic outcomes. Baker (2004) also highlighted that a lack of motivation correlates with inadequate adjustment to university life, noting that students driven solely by external rewards, such as high grades, often performed poorly. Building on these insights and positing that students who are intrinsically and

extrinsically motivated are better equipped to navigate and adjust to their educational environments it is anticipated that academic adjustment will exert both direct and indirect effects on academic achievement through various forms of motivation, including intrinsic motivation, extrinsic motivation, and amotivation. This framework aligns with SDT, which emphasizes the critical role of intrinsic and extrinsic motivations in facilitating optimal adjustment and performance outcomes in academic contexts. Thus, the following hypotheses were proposed.

H2a: Intrinsic motivation will mediate the effect of academic adjustment on academic performance.

H2b: Extrinsic motivation will mediate the effect of academic adjustment on academic performance.

H2c: Amotivation will mediate the effect of academic adjustment on academic performance.

The Moderating Role of Psychological Well-being

Psychological well-being provides the foundation for the effective and efficient functioning of an individual, playing a crucial role in growth and development in early adulthood, leading to a flourishing and fulfilling life. Well-being encompasses happiness, health, purpose in life, the development of potential, and good social relationships (Huppert, 2009). Subjective well-being, as defined by previous researchers such as Diener et al. (1999) and Ryan and Deci (2001), is an evaluation of life circumstances, including a cognitive assessment of satisfaction with life and the frequency of experiencing positive and negative affects (Diener et al., 1999). It is studied in two main approaches: the hedonic and eudaimonic approaches. The hedonic approach views subjective well-being from a happiness-oriented perspective, measuring subjective experiences with indicators such as positive affect and job satisfaction. The eudaimonic approach considers subjective well-being as achieving one's potential, viewing it as a construct of psychological well-being measured by indicators such as self-actualization and personal achievement (Ryan & Deci, 2001).

This study defines psychological well-being as life satisfaction and fewer experiences of negative emotions and a general experience of positive emotions, manifested as a cognitive appraisal during which the person's life is evaluated according to definite criteria, such as having a more positive outlook on life (Diener et al., 1999; Diener et al., 1985). Studies related to psychological well-being are crucial because if students' psychological well-being is good and prosperous, they can function more effectively, improving their academic adjustment and potentially influencing their academic achievement. Students with higher levels of psychological well-being often perceive their environment as positive and student-centered, fostering psychological security that aids in academic adjustment and active engagement in learning. High life satisfaction enhances students' ability to experience positive emotions, such as pride and joy from improved grades, which in turn boosts their academic motivation. Conversely, low psychological well-being leads to diminished interest and motivation, resulting in poor adjustment and performance (Chen et al., 2023). While many studies examine academic adjustment, motivation, well-being, and performance, few explore these dynamics with motivation as a mediator and well-being as a moderator. This study, therefore, contributes valuable insights to the existing research. Thus, the following hypotheses were proposed.

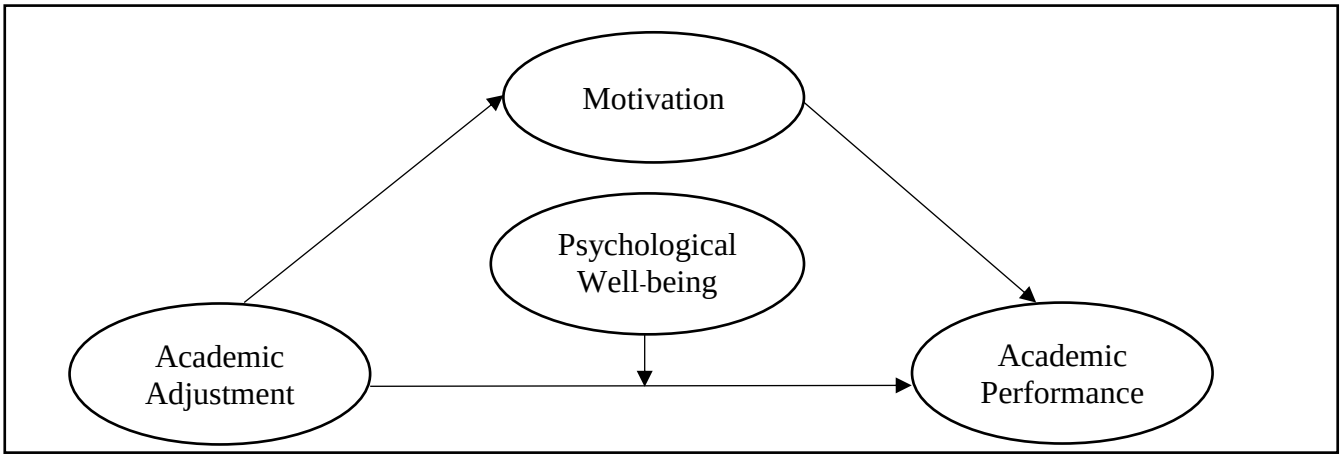
H3a: Psychological well-being will moderate the effect of academic adjustment on academic performance through intrinsic motivation.

H3b: Psychological well-being will moderate the effect of academic adjustment on academic performance through extrinsic motivation.

H3c: Psychological well-being will moderate the effect of academic adjustment on academic performance through amotivation.

The Figure 1 shows the conceptual framework of the study.

Figure 1
Proposed Conceptual Framework



Method

Research Design

This study employs a causal research design to explore the relationships among specified variables within the research's conceptual framework. This study examines the role of mediator and moderator variables in influencing the relationship between the independent and dependent variables. The independent variable in this study is academic adjustment, while the dependent variable is academic performance. Motivation— comprising intrinsic motivation, extrinsic motivation, and amotivation— serves as the mediator variable, and psychological well-being is the moderator variable.

Sample

The participants in this study were undergraduate students at Chiang Mai University in Thailand, meeting the following criteria: (1) active students; (2) having studied for at least one year; (3) enrolled in a Thai program. This research focuses solely on Chiang Mai University, located in northern Thailand, due to its relevance and potential future importance concerning the increasing dropout rates among first-year university students. The total number of first-year students was 7,027 (as of June 13, 2021). The G*Power 3.1 application was utilized to determine the minimum sufficient sample size for this study. The analysis indicated that a minimum of 485 participants would be necessary to detect a medium effect size with statistical significance at the .05 level (Faul et al., 2007), considering four predictor variables. Convenience sampling, a non-random sampling technique, was used for sample selection. Data collection occurred between June and August 2021 using an online questionnaire. Initially, 600 participants were collected, however 28 did not pass the item checker, resulting in a final sample size of 572 participants. This sample size represents an acceptable participation rate for examining moderated-mediation analysis (Warner, 2013).

Instruments

All research instruments used in this study, except for academic performance based upon grade point average (GPA) and a demographic information sheet, were translated from English to Thai and then back-translated to ensure language equivalence. This process was conducted by two experts in language proficiency. The content validity of the instruments was evaluated by five psychology experts using the index of item-objective congruence (IOC). Items with an IOC value lower than .50 were revised according to the experts' recommendations, while those with a value of .50 or higher were retained.

(1) Academic performance: GPA represents academic performance and is based on self-reported data. The GPA for first-year courses is calculated by multiplying the number of credits by the grade earned

in each course across both semesters, and then dividing by the total number of credits registered over the two semesters. Thai university grading system ranges from 0.00 (failed) to 4.00 (excellent).

(2) Academic adjustment: The academic adjustment subscale of the student adaptation to college questionnaire (SACQ), developed by Baker and Siryk (1984), was utilized to assess academic adjustment. This subscale comprises of 24 items rated on a 9-point scale, ranging from 1 (does not apply to me at all) to 9 (applies to me perfectly). A sample item is, "I keep up with the learning, papers, and assignments received in classes."

(3) Motivation: The academic motivation scale (AMS), developed by Vallerand et al. (1992), was used to assess intrinsic motivation, extrinsic motivation, and amotivation. The scale consists of 28 items rated on a 7-point scale, ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Sample items include: “Because I experience pleasure and satisfaction while learning new things” (intrinsic motivation), “Because I think that a college education will help me better prepare for the career I have chosen” (extrinsic motivation), and “I can’t see why I go to college and frankly, I couldn’t care less” (amotivation).

(4) Psychological well-being: The satisfaction with life scale (SWLS), developed by Diener et al. (1985), was utilized to measure psychological well-being. This scale comprises five items rated on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A sample item is “I am satisfied with my life.”

(5) Personal information sheet; The personal information sheet requested participants to provide their gender, academic year, and GPA.

Measurement Model Validation

Before testing the hypotheses, confirmatory factor analysis (CFA) using AMOS (v.29) software was used to examine the convergent validity of each construct. According to the CFA results of default model were satisfactory: AGFI = .91, TLI = .90, NFI = .91, CFI = .93, GFI = .95 all values more than .90 (Hair et al., 2019). The Chi-Square are $\chi^2/df = 5.57$, $p = .000$ and RMSEA value in this study is .07, which is lower than recommended threshold of .08 (Hair et al., 2019), indicating that the research model was sufficient. Cronbach’s alpha values of each construct exceed .70, suggesting that this questionnaire has high internal consistency (Nunnally & Bernstein, 1944). The validity testing shows that the values of composite reliabilities (CRs) exceed .70 and the average variance extracted (AVEs) of each construct exceed .50 indicating that each variable meets the requirements for discriminant validity (Hair et al., 2019) (see Table 1). However, the average variance extracted is below than .50 and the composite reliability is above than .60, the construct has acceptable convergent validity (Fornell & Larcker, 1981).

Table 1

Reliability and Validity of the Study Variables

Variables	Cronbach’s Alpha	AVE	Composite Reliability
Academic adjustment	.87	.43	.66
Intrinsic motivation	.92	.50	.80
Extrinsic motivation	.87	.51	.74
Amotivation	.82	.53	.58
Psychological well-being	.76	.51	.60

Data Analysis

Data analysis was performed using the SPSS version 29. Descriptive statistics, including means, standard deviations, and Cronbach’s alphas, were calculated to evaluate the reliability and measures of the assessed constructs. Pearson product-moment correlations were employed to assess the relationships

between variables. For the moderated mediation analysis, the procedure outlined by Hayes' PROCESS Macro (5) for SPSS (version 4.2) was applied to assess the significance of both direct and indirect effects. Normality testing was not conducted, as bootstrapping (n = 5,000) was utilized in accordance with Hayes' recommendations (Hayes, 2022).

Ethical Considerations

Before data collection, an invitation message with the questionnaire link was sent to contacts and shared on social media platforms. Participants were informed about the study's purpose and process, their right to voluntarily withdraw, and the assurances of privacy, confidentiality, and anonymity. Each participant consented to the study by completing and signing the consent form.

Results

Descriptive Results

The demographic characteristics of the 572 participants included 32.9% identifying as men, 67.0% as women, and .2% who did not specify their gender. Regarding their fields of study, 49.0% were enrolled in humanities and social sciences, 30.5% in science and technology programs, and 20.5% in health sciences. The participants had a mean grade point average (GPA) of 3.04 with a standard deviation of .52. Table 2, shows that descriptive statistics, internal consistencies, and correlations between the variables. The correlations ranged from .16 to .72 ($p < .01$). Academic adjustment was significantly positively correlated with academic performance and psychological well-being. Additionally, both intrinsic and extrinsic motivation showed positive correlations with psychological well-being academic adjustment, academic performance, and psychological well-being. The negative correlation of amotivation with all variables was significant. Moreover, academic performance was significantly and positively correlated with psychological well-being.

Table 2

Means, Standard Deviations and Correlation among the Study Variables

Variables	Mean	SD	1	2	3	4	5	6
1. Academic adjustment	5.09	1.00	1.00					
2. Intrinsic motivation	5.05	1.10	.43**	1.00				
3. Extrinsic motivation	5.12	1.01	.29**	.72**	1.00			
4. Amotivation	2.62	1.25	-.46**	-.31**	-.29**	1.00		
5. Academic performance	3.04	.52	.27**	.17**	.16**	-.28**	1.00	
6. Psychological well-being	4.02	1.30	.49**	.38**	.31**	-.27**	.19**	1.00

Note. n = 572, ** $p < .01$.

Hypothesis Testing Results

The mediating and moderated-mediation effects were tested using the PROCESS 4.2 macro in SPSS v. 29.0 (model 5). The bias-corrected bootstrap estimation method, based on a 5000 resample, was used to obtain the bias-corrected 95% confidence interval (BCIs) for the direct and conditional effects (Hayes, 2022). When the 95% bootstrapped confidence interval does not include 0, all effects are considered significant. The results of the PROCESS macro (model 5) were employed to examine the mediating role of motivation, including intrinsic motivation, extrinsic motivation, and amotivation, on the relationship between academic adjustment and academic performance, as demonstrated in Table 3. The findings from the three models examining different dimensions of motivation indicate that academic adjustment is positively predicting academic performance in model 1 (intrinsic motivation; direct effect = .47, t = 11.29, $p < .001$) and model 2 (extrinsic motivation; direct effect = .29, t = 7.22, $p < .001$). However, the results of model 3 (amotivation) suggest a negative association between academic adjustment and academic performance (direct effect = -.22, t = -4.38, $p < .001$). Therefore, the results supported H1.

According to the results, 5000 bootstraps were employed to examine the mediating roles of intrinsic motivation, extrinsic motivation, and amotivation. The results indicate that both extrinsic motivation and amotivation mediate the relationship between academic adjustment and academic performance. The indirect effects between academic adjustment and academic performance through extrinsic motivation and amotivation were significant (extrinsic motivation: β = .01, 95% BCI = [.002; .03]; amotivation: β = .01, 95% BCI = [002; .02]) respectively. Thus, H2b and H2c were supported. Additionally, the indirect effect between academic adjustment and academic performance through intrinsic motivation was significant (β = .01, 95% BCI = [-.01; .03]). The direct effect of academic adjustment on intrinsic motivation was also significant (direct effect = .10, $t = 4.04$, $p < .01$), however, the direct effect of intrinsic motivation on academic performance was not significant (direct effect = .02, $t = 1.11$, $p > .05$). Intrinsic motivation did not mediate the relationship between academic adjustment and academic performance and therefore rejected H2a.

Table 3

Results of Moderated Mediation Effects Hayes PROCESS Macro (5)

Direct effects	Motivation			Academic performance		
	β	SE	*t*-value	β	SE	*t*-value
Model 1: Intrinsic motivation						
Constant	5.05	.04	120.75***	2.90	.11	26.21***
Academic adjustment	.47	.04	11.29***	.10	.03	4.04**
Intrinsic motivation				.02	.02	1.11
Psychological well-being				.03	.02	1.67
Academic adjustment × Psychological well-being				.03	.01	2.17*
	$R^2 = .18$, F (1,570) = 127.44***			$R^2 = .08$, F (4,567) = 13.28***		
Model 2: Extrinsic motivation						
Constant	5.12	.04	126.72***	2.80	.12	24.33***
Academic adjustment	.29	.04	7.22***	.10	.03	4.20***
Extrinsic motivation				.04	.02	1.98*
Psychological well-being				.03	.02	1.52
Academic adjustment × Psychological well-being				.03	.01	2.13*
	$R^2 = .08$, F (1,570) = 52.18***			$R^2 = .09$, F (4,567) = 14.00***		
Model 3: Amotivation						
Constant	2.61	.05	51.22***	3.13	.05	61.22***
Academic adjustment	-.22	.05	-4.38***	.11	.02	4.31***
Amotivation				-.04	.02	-2.36*
Psychological well-being				.03	.02	1.76
Academic adjustment × Psychological well-being				.03	.01	1.92
	$R^2 = .03$, F (1,570) = 19.16***			$R^2 = .09$, F (4,567) = 14.46***		

Indirect effects	Bootstrapped Indirect Effect	Boot SE	Boot LLCI, ULCI
AD → InMo → GPA	.01	.01	-.01, .03
AD → ExMo → GPA	.01	.01	.002, .03
AD → Amo → GPA	.01	.01	.002, .02

Note. ULCI = Upper level confidence interval, LLCI = Lower level confidence interval, AD = Academic adjustment, InMo = Intrinsic motivation, ExMo = Extrinsic motivation, Amo = Amotivation, GPA = Academic performance. * $p < .05$, ** $p < .01$, *** $p < .001$.

In addition, the moderating effect of psychological well-being was tested on the mediation model as shown in Table 3. The results indicated that only the significant interaction of academic adjustment and psychological well-being predicted academic performance through extrinsic motivation (β = .03, t = 2.17, p < .05, BCI = [.002; .06]). This result demonstrated that the mediation model was moderated by psychological well-being. Hence, the positive linkage of academic adjustment with academic performance is weaker in students who have a low level of psychological well-being, with the intensity being weaker (-1SD of mean: β = .07, p < .05, CI = [.004; .13]). The positive linkage of academic adjustment with academic performance is stronger with a high level of psychological well-being whilst the intensity is stronger (+1SD of mean: β = .14, p < .001, CI = [.09; .20]). The students having interaction of high academic adjustment experience and a greater increase in life satisfaction from psychological well-being, with high extrinsic motivation leading to enhanced academic performance compared to those with low academic adjustment. Thus, these moderated mediation analyses provide evidence to support H3b. Furthermore, the results also indicated that psychological well-being moderates the positive effect of academic adjustment as a predictor of academic performance (β = .03, t = 2.17, p < .05, BCI = [.003; .06]), but not through intrinsic motivation (β = .02, t = 1.11, p > .05, BCI = [-.02; .07]). However, psychological well-being did not moderate the positive effect of academic adjustment as a predictor of academic performance through amotivation (β = .03, t = 1.92, p > .05, BCI = [-.001; .05]). As a result, psychological well-being did not moderate the relationship between academic adjustment and academic performance through intrinsic motivation and amotivation, therefore rejecting H3a and H3c.

Discussion and Conclusion

Discussion of Main Results

The main purpose of this study was to examine how psychological well-being moderates the indirect effect of academic adjustment on academic performance through motivation (intrinsic motivation, extrinsic motivation, and amotivation). The results indicated that academic adjustment positively influences academic performance. Academic adjustment plays an essential role in predicting GPA, students with better academic adjustment tend to have higher GPA and more credits in their degree programs, demonstrating a stronger intention to complete their chosen courses of study. The results support previous studies (Bailey & Phillips, 2015; Li et al., 2023; Raza et al., 2021; Rodríguez et al., 2017; van Rooij et al., 2018).

This study investigated a moderated mediation model, examining how psychological well-being moderates the relationship between academic adjustment and academic performance, with motivation acting as the mediating variable. The results indicated that both extrinsic motivation and amotivation mediated the relationship between academic adjustment and academic performance. However, intrinsic motivation did not mediate this relationship. These findings were not in line with previous studies, which have generally indicated that intrinsic motivation has a more significant beneficial impact than extrinsic motivation (Meng & Hu, 2022; Raza et al., 2021). Specifically, intrinsic motivation and academic adjustment have been identified as significant predictors of academic performance (Bailey & Phillips, 2015; Manganelli et al., 2019). Researchers employing SDT distinguish between short-term and long-term motivational responses to specific activities, such as course assignments or team interactions. Studies indicate that all forms of motivation can fluctuate over time. Intrinsic motivation, often associated with deep learning and sustained engagement, is typically linked to activities that students find inherently interesting or enjoyable. However, if academic tasks do not align with students' interests or are perceived as irrelevant to their personal goals, intrinsic motivation may not translate into enhanced academic performance. Moreover, its impact on immediate academic outcomes may be less evident when students are focused on short-term objectives, such as passing exams or completing assignments. In these situations, students may adopt surface-level learning strategies that meet immediate requirements but do not necessarily reflect a genuine interest in the subject matter (Stolk et al., 2021).

However, this study corroborates the findings of previous research (Bailey & Phillips, 2015; Cheng, 2018; Manganelli et al., 2019), which indicated that extrinsic motivation exhibits minimal correlation with key outcomes such as persistence, academic performance, and psychological well-being. In addition, Meng and Hu (2022) found that extrinsic motivation was positively influenced academic performance both directly and indirectly through online learning behavior, which emerged during the COVID-19 pandemic. These behaviors are considered part of academic adjustment. Thai first-year undergraduates who demonstrate academic adjustment and exhibit extrinsic motivation are expected to attain higher academic performance. This is due to extrinsically motivated students tending to engage in goal-oriented behavior, focusing on tasks that lead to specific outcomes. Their behaviors reflect a desire to achieve concrete standards, such as a high GPA or social recognition, for their learning goals. Additionally, in Thai educational settings, there is a strong emphasis on extrinsic motivators such as grades, recognition, and future career prospects. When extrinsic motivation predominates, it can diminish the influence of intrinsic motivation on academic performance. As a result, students may prioritize activities that are externally rewarded rather than those that are personally meaningful or fulfilling.

Furthermore, within SDT (Ryan & Deci, 2020), amotivation refers to the absence of motivation. Previous research (Bailey & Phillips, 2015; Baker, 2004) suggests that students experiencing amotivation tend to struggle with adjusting to university life and consistently demonstrate poor academic performance. Undergraduates reporting high levels of amotivation exhibit non-regulated and non-intentional behaviors. These behaviors may result from feelings of inability to complete an activity successfully, a lack of expectation for the activity to yield a desired outcome, or lack of value for the activity. Consequently, amotivation in undergraduates is strongly associated with poor adjustment and negatively linked to educational outcomes, such as reduced perceptions of competence and concentration, and decreased academic performance.

This study examined a moderated mediation model, investigating the moderating role of psychological well-being in the relationship between academic adjustment and academic performance, with motivation serving as the mediator. The results show that only psychological well-being acts as a moderator of the relationship between academic adjustment and academic performance through extrinsic motivation. Psychological well-being as life satisfaction, fewer experiences of negative emotions and a general experience of positive emotions, manifested as a cognitive appraisal during which the person’s life is evaluated according to some definite criteria (Diener, 2000; Diener et al., 1985). Research on psychological well-being is essential, as students with good psychological well-being can function more effectively, enhancing their academic adjustment and potentially enhancing both their academic performance and achievement (Bailey & Phillips, 2015). The interaction between academic adjustment and psychological well-being plays a crucial role in enhancing academic performance, particularly through the lens of extrinsic motivation. Students who effectively manage academic challenges while experiencing happiness and overall life satisfaction are more likely to achieve high levels of success, reflected in robust GPAs, impressive examination scores, and recognition within their academic environments. Research conducted in college settings highlights that an appropriate level of extrinsic motivation stimulates effort and persistence in learning, demonstrating a positive correlation with academic performance and achievement (Chen et al., 2023). Extrinsic incentives, including grades, scholarships, and praise from parents or faculty, act as motivating factors that encourage students to invest greater effort in their studies. The desire to attain these external rewards propels students to diligently complete assignments, thoroughly prepare for examinations, and engage more with their coursework (Meng & Hu, 2022). Thus, both extrinsic motivation and psychological well-being is essential for students' academic adjustment and accomplishments.

Limitations and Future Research Directions

This study has several limitations that should be considered despite making some helpful theoretical contributions. Firstly, most of the variables were measured through self-report methods which may have

resulted in common method bias and reduced the validity of the findings. Future research should consider using a combination of methods such as collecting data using teacher and parent reports. Secondly, this study collected field data during the COVID-19 pandemic which required data collection at different times as students transitioned from studying in the classroom to online learning. Data collection in post COVID-19 should be a priority for future studies. Thirdly, the participants in our study were first-year undergraduate students at a university, limiting the generalizability of finding. There may be differences among students in different educational years. Additionally, this study did not examine the measurement model's control variables. Therefore, the control variables should be examined in future research. Finally, future research should consider examining gender as a factor influencing the relationship between the variables, as differences in cognition, motivation, excitement, and social behavior between genders can impact academic performance in various ways. Research indicates that females generally display higher academic motivation, persistence, and commitment to completing university compared to males (Vecchione et al., 2014). However, studies like Stolk et al. (2021) reveal that in lecture-based courses, women report lower self-determined motivation than men. In contrast, active learning methods result in more similar and positive motivational profiles across genders, which can directly or indirectly influence academic performance. Furthermore, future research should facilitate a more detailed investigation of the direct and indirect relationships amongst academic adjustment, motivational orientations, well-being, and academic performance of older students. Comparing these findings with those of younger students may highlight areas for intervention to enhance academic performance.

Implications for Behavioral Science

The results can inform the development of activities that promote academic adjustment, enhance motivation, and improve psychological well-being, thereby fostering effective academic performance. Quality education transcends academic achievement; university policymakers should leverage institutional potential to facilitate students' adjustment to academic life by enhancing study skills and developing intervention programs for those struggling with adjustment (Chen et al., 2023). This could include academic counseling clubs staffed by professionals and training programs to enhance students' skills.

Improving student motivation can clarify the significance of learning and career development plans through relevant courses, motivational lectures, and performance adjustment guidelines. Teachers and parents can employ extrinsic motivation strategies such as rewards, praise, and positive environments to encourage desired behaviors (Amholt et al., 2020).

This study provides valuable insights for shaping educational practices and policies to achieve sustainable development goal 4 (SDG 4) in the Thai context, aimed at enhancing educational quality and inclusivity (UNESCO, 2016). However, it is important to note that these findings cannot be generalized beyond the specific educational settings and cultural dynamics present in Thailand. The unique socio-cultural factors influencing education in Thailand may affect the applicability of the results in different contexts, thus necessitating further research to explore how these insights can be effectively adapted to diverse educational environments. It explains the role of external rewards and psychological well-being as mediators and moderators in improving academic outcomes for first-year university students. Policymakers and educators can implement strategies that boost extrinsic motivation and psychological well-being, such as mental health support services and reward systems. Additionally, the research advocates for creating an educational environment that fosters lifelong learning and personal growth.

Conclusion

The findings indicate that academic adjustment is crucial in predicting academic performance. Positive extrinsic motivation significantly and partially mediates the relationship between academic adjustment and academic performance among first-year undergraduates in Thailand. Conversely,

amotivation also significantly and partially mediates this relationship. Additionally, a moderated mediation analysis confirmed that psychological well-being significantly moderates the relationship between academic adjustment and academic performance when mediated by extrinsic motivation. Therefore, first-year undergraduate students can achieve better academic adjustment with external motivation, such as praise and support from teachers, friends, and family. As students' psychological well-being improves and they adjust more effectively, their academic performance will also be enhanced.

Declarations
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Conflicts of Interest: The authors declare no conflicts of interest.
Ethical Approval Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Chiang Mai University (protocol code COA No. 054/64, dated 8 June 2021) for studies involving humans.

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