TRANSLATION, FACTOR STRUCTURE, AND VALIDATION OF THE THAI VERSION OF THE ACADEMIC SELF-REGULATION SCALE (ASRS-Thai) AMONG UNIVERSITY STUDENTS

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ABSTRACT

Academic self-regulation is a crucial factor associated with students' academic success, motivation, and adaptive learning behaviors in higher education; however, validated Thai instruments specifically measuring this construct remain limited. This study aimed to translate and validate the Thai version of the Academic Self-Regulation Scale (ASRS-Thai) among university students. Using a standardized forward–backward translation procedure with bilingual expert review, the scale was administered to 900 undergraduate students. The sample was divided into two groups: 200 participants for Exploratory Factor Analysis (EFA) and 700 for Confirmatory Factor Analysis (CFA). Results from EFA supported a five-factor structure consistent with the original model, with factor loadings exceeding .50. CFA further confirmed a good model fit (X^2/df = 2.598, CFI = .951, TLI = .946, RMSEA = .048). The ASRS-Thai demonstrated excellent internal consistency (α = .95) and established convergent validity through significant positive correlations with academic self-efficacy and gratitude, and a significant negative correlation with academic procrastination. These findings indicate that the ASRS-Thai is a robust and reliable instrument. Consequently, it can be effectively utilized for student assessment, academic counseling, and the development of targeted educational interventions within the Thai higher education context.

Keywords: academic self-regulation, scale validation, confirmatory factor analysis, cross cultural adaptation, Thai university students

INTRODUCTION

Academic self-regulation is an essential concept in understanding students' academic success, persistence, and psychological adjustment in higher education contexts, where learners are increasingly expected to manage their learning processes independently (Xu et al., 2023; Zhao et al., 2025; Zimmerman, 2000; Zimmerman & Schunk, 2011). Students with stronger self-regulatory skills tend to demonstrate better academic performance, greater motivation, and higher levels of persistence. University students are especially vulnerable to challenges in academic self-regulation during the transition from high school,

where learning is more teacher-guided, to a more independent learning environment. Insufficient self-regulatory capacity has been correlated with maladaptive academic outcomes, including difficulties initiating tasks, ineffective time management, and increased academic procrastination (Steel, 2007; Howell & Watson, 2007). Therefore, assessing academic self-regulation is important for identifying students who may benefit from academic or psychological support.

From the social cognitive perspective, academic self-regulation is conceptualized as a cyclical mechanism including self-generated thoughts and actions systematically oriented toward learning outcomes (Zimmerman, 2000). Following the framework by Akhtar and Mahmood (2013) and the cyclical model proposed by Zimmerman (1998, 2000), this construct consists of five core dimensions: self-planning, self-monitoring, self-instruction, self-evaluation, and self-reaction. Self-planning involves the initial establishment of goals and strategic readiness, while self-monitoring allows students to track and adjust their behaviors in accordance with academic requirements (Akhtar & Mahmood, 2013; Worchel et al., 2000). Self-instruction serves as internal guidance to navigate complex challenges, followed by self-evaluation, where students judge the quality of their performance against specific standards (Zimmerman, 1998; Baron et al., 1989). Finally, self-reaction encompasses the cognitive and affective responses to these evaluations, which ultimately drive future learning adaptations (Zimmerman, 1998). To assess these dimensions, Akhtar and Mahmood (2013) developed the Academic Self-Regulation Scale (ASRS), which demonstrated satisfactory psychometric properties in its original context.

However, to date, a validated the ASRS-Thai that specifically examines these five core dimensions has yet to be established. This represents an important gap in the literature, as the absence of a culturally appropriate Thai instrument limits research and intervention efforts related to academic self-regulation among Thai university students. Therefore, the present study aimed to translate and culturally adapt the ASRS into Thai and to examine its psychometric properties among Thai university students. Specifically, this study evaluated the factor structure, internal consistency reliability, and construct validity of the ASRS-Thai.

RESEARCH OBJECTIVES

This study aimed to:

1. translate and culturally adapt the Academic Self-Regulation Scale (ASRS) into Thai using a standardized translation and cultural adaptation procedure.

2. examine whether the Thai version of the Academic Self-Regulation Scale (ASRS-Thai) demonstrates a five-factor structure using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

3. evaluate the internal consistency reliability of the Thai version of the Academic Self-Regulation Scale (ASRS-Thai).

4. assess the construct validity of the Thai version of the Academic Self-Regulation Scale (ASRS-Thai), including convergent and discriminant validity through its associations with theoretically related constructs.

EXPECTED BENEFITS

The validated Thai version of the Academic Self-Regulation Scale (ASRS-Thai) provides a reliable and culturally appropriate tool for evaluation academic self-regulation among Thai university students. This instrument supports research and applied practice by enabling accurate measurement of self-regulated learning behaviors and informing educational and counseling interventions. Additionally, the Thai version of ASRS facilitates the cross-cultural research on academic self-regulation within higher education contexts in the future.

RESEARCH SCOPE

This study emphasized the translation, cultural adaptation, and psychometric validation of the Academic Self-Regulation Scale (ASRS) for Thai university students. The scope of this study included translation from English to the Thai language, and empirical evaluation of the scale's factor structure, internal consistency reliability, and construct validity. The outcomes are specific to Thai undergraduate students and aim to support the use of the Thai version of ASRS in research and applied academic settings.

LITERATURE REVIEW

Self-regulation is generally defined as the ability of individuals to modify their behavior, thoughts, and emotions to achieve personal goals (Zimmerman, 2000; Baumeister et al., 2007). This process involves adapting actions based on personal experiences and observations of others (Bandura, 1991). In an educational context, academic self-regulation refers to students' proactive management of their internal learning resources (Akhtar & Mahmood, 2013). According to Iran-Nejad and Chissom (1992), effective learning occurs when students actively control these internal regulatory sources to navigate their academic tasks.

Theoretical Framework: Zimmerman's Cyclical Model

The basis of academic self-regulation is rooted in the social cognitive perspective, which views it as a cyclical process rather than a static trait. Zimmerman (1998, 2000) proposed that this cycle consists of three interrelated phases:

Forethought Phase: This initial stage involves task analysis, such as setting goals and strategic planning, driven by self-motivation beliefs like self-efficacy.

Performance Phase: During the learning activity, students exercise self-control and self-observation. They use techniques like self-instruction and mental imagery to maintain focus and track their progress.

Self-Reflection Phase: After the task, students evaluate their performance. This involves causal attribution—judging the reasons for their success or failure—which leads to self-reactions that influence their preparation for future tasks.

According to the cyclical model, Akhtar and Mahmood (2013) developed the ASRS to measure five specific regulatory dimensions:

Self-Planning: The process of establishing objectives and preparing mentally for academic work.

Self-Monitoring: As noted by Worchel et al. (2000), this involves adjusting one's actions to fit specific circumstances or social norms. High self-monitors are acutely aware of how others respond to them and adapt accordingly (Akhtar & Mahmood, 2013).

Self-Instruction: The act of guiding oneself through academic difficulties by observing and evaluating personal skills and solutions (Zimmerman, 1998).

Self-Evaluation: The systematic assessment of one's own work quality. It is often the first step of self-reflection, where learners compare their results against established standards (Baron et al., 1989; Zimmerman, 1998).

Self-Reaction: The final stage of the cycle, involving the emotional and cognitive coping mechanisms used after reflecting on performance outcomes (Zimmerman, 1998).

The transition to higher education necessitates a shift from teacher-led instruction to autonomous learning, making academic self-regulation a critical determinant of success. Unlike the supervised environment of high school, university students must exercise full responsibility for their schedules, motivation, and strategic learning without external pressure. Research indicates that a lack of self-regulatory capacity often manifests as academic procrastination and poor time management, both of which are strongly linked to lower achievement (Terry & Doolittle, 2008; Wolters & Brady, 2020). Consequently, assessing how students regulate their learning is vital for developing support systems that foster academic persistence.

The Academic Self-Regulation Scale (ASRS), developed by Akhtar and Mahmood (2013), was designed to comprehensively measure how university students manage their internal resources and learning behaviors. Their foundational study in Pakistan demonstrated robust psychometric properties, including high internal consistency and a stable factor structure across five core dimensions: self-planning, self-monitoring, self-instruction, self-evaluation, and self-reaction. Significantly, the ASRS offers a distinct cultural advantage for research in Thailand. As both Pakistan and Thailand share Asian educational values—such as social harmony and respect for authority—this cultural alignment suggests the ASRS may possess higher ecological validity for Thai students than instruments developed in Western

contexts. The successful validation of the ASRS in a similar Asian setting underscores its relevance for assessing self-regulation within comparable academic environments.

Previous research has consistently identified academic self-regulation as a strong predictor of educational success. While high ASRS scores correlate with increased academic self-efficacy and achievement (Fernandez-Rio et al., 2017), a deficiency in these skills is linked to maladaptive behaviors, including procrastination and poor time management (Park & Sperling, 2012; Wolters & Brady, 2020). Despite its established utility, the application and validation of the ASRS within the Thai context remain scarce. This significant gap in the literature underscores the necessity of the present study, which seeks to provide a culturally adapted Thai version (ASRS-Thai) to enhance the academic development of university students in Thailand.

HYPOTHESIS

1. The Thai version of the Academic Self - Regulation Scale (ASRS-Thai) will exhibit a five-factor structure—self-planning, self-monitoring, self-instruction, self-evaluation, and self-reaction, as supported by Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

2. The Thai version of the Academic Self - Regulation Scale (ASRS-Thai) will exhibit high internal consistency reliability.

3. The Thai version of the Academic Self-Regulation Scale (ASRS-Thai) will demonstrate significant positive correlations with the Thai versions of the College Self-Efficacy Inventory (CSEI) and the Thai version of Gratitude Questionnaire (GQ), and significant negative correlations with the Thai version of the Academic Procrastination Scale (APS), providing evidence of convergent and discriminant validity.

CONCEPTUAL FRAMEWORK

This study focuses on the translation and psychometric validation of the Thai version of the Academic Self-Regulation Scale (ASRS-Thai) among Thai university students. The conceptual framework, as illustrated in Figure 1, is grounded in Zimmerman's (2000) social cognitive perspective and follows presents the three major stages of the study: (1) translation and cultural adaptation, (2) examination of factor structure through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), and (3) evaluation of reliability and construct validity. Cultural adaptation was included to ensure that the translated items were appropriate and relevant within the Thai educational context. These stages provide a systematic framework for validating the ASRS-Thai within the Thai university context. A detailed explanation of each stage within this framework is provided in the Methodology section.

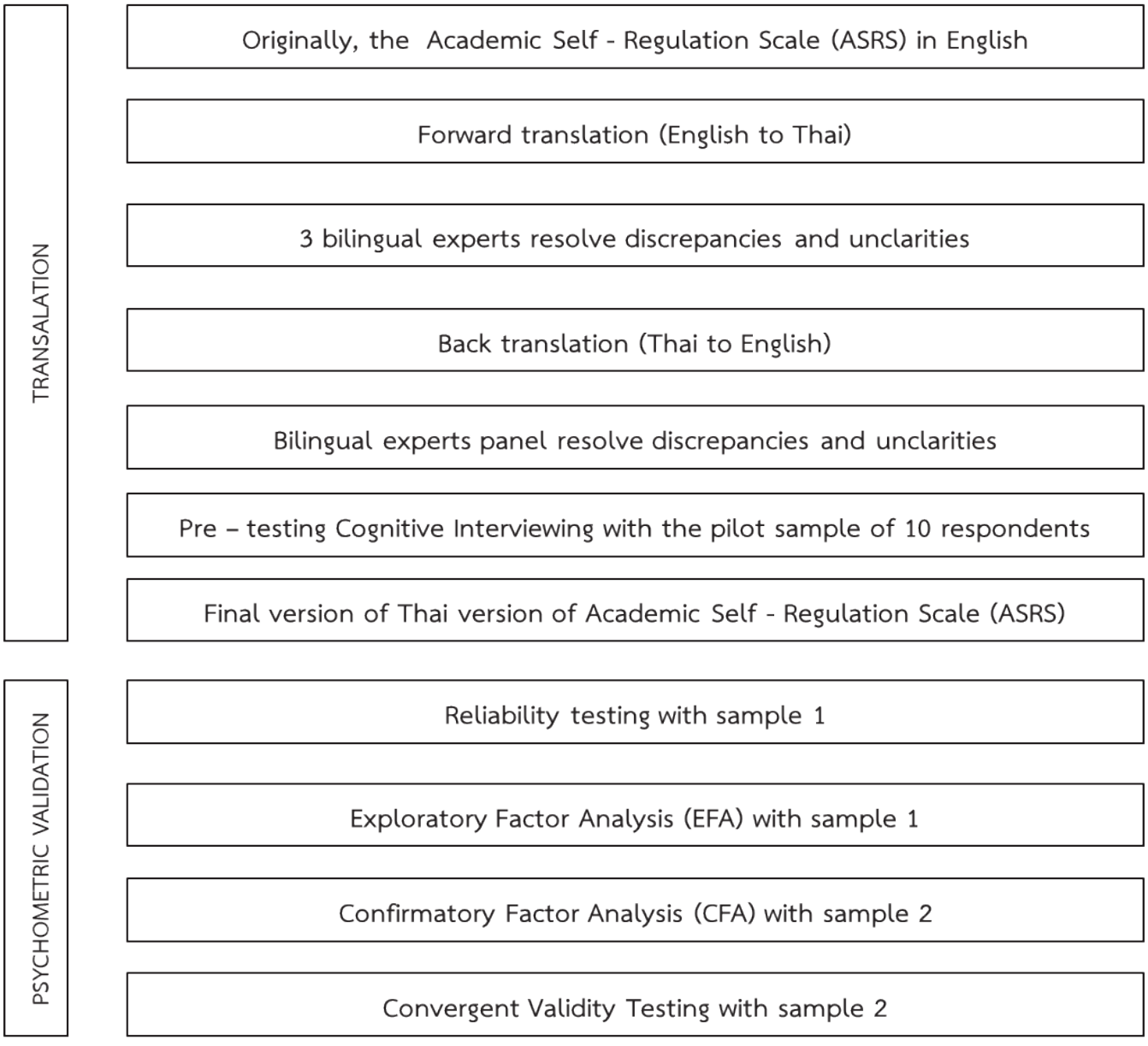


Figure 1 Translation and Validation Process of the Study

METHODOLOGY

Research Design

This study employed a quantitative cross-sectional research design to translate and validate the Academic Self-Regulation Scale (ASRS-Thai) among Thai university students. This design is widely recommended for scale translation and psychometric validation studies, as it allows for the systematic examination of factor structure, reliability, and validity at a single point in time.

The research process consisted of two main phases. First, the Academic Self-Regulation Scale was translated and culturally adapted from the original English version into Thai using a standardized translation procedure to ensure semantic and conceptual equivalence. Second, the psychometric

properties of the ASRS-Thai were evaluated through statistical analyses, including Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), internal consistency reliability, and convergent validity testing.

Separate samples were utilized for EFA and CFA to strengthen the robustness of the factor structure and to reduce the risk of model overfitting. All data were collected through self-report questionnaires administered to Thai university students in Nakhon Pathom Province.

Participants

Participants were Thai undergraduate students enrolled in eight educational institutions, which could be classified into two main categories: public and private universities in Nakhon Pathom Province, Thailand. Two independent samples were used to evaluate the psychometric properties of the ASRS-Thai. The first sample consisted of 200 students for Exploratory Factor Analysis (EFA), and the second sample included 700 students for Confirmatory Factor Analysis (CFA). The sample sizes were considered adequate based on commonly recommended participant-to-item ratios for factor analysis, with the CFA sample providing robust statistical power for structural validation. The use of separate samples for EFA and CFA is recommended in scale validation research to reduce model overfitting and to provide stronger evidence of structural stability across samples.

Participants were recruited using convenience sampling. This sampling method was considered appropriate for an initial psychometric validation study, in which the primary objective was to examine the internal structure, reliability, and validity of the instrument rather than to estimate population prevalence. However, because participants were recruited from one province, caution is warranted when generalizing the findings to all Thai university students.

Inclusion criteria required that participants be Thai nationals, currently enrolled as undergraduate students, and able to read Thai. Participation was voluntary, informed consent was obtained, and ethical standards regarding confidentiality and anonymity were strictly observed.

Research Instruments

The Academic Self-Regulation Scale (ASRS), developed by Akhtar and Mahmood (2013), is a self-report measure designed to assess academic self-regulation among university students. The scale evaluates key components of self-regulated learning, including self-planning, self-monitoring, self-instruction, self-evaluation, and self-reaction, which reflect students' ability to manage and regulate their academic behaviors. The ASRS consists of multiple items rated on a 5-point Likert-type scale, with higher scores indicating higher levels of academic self-regulation. It is important to highlight that those questions phrased negatively (items 7, 10, 13, 15, 16, 20, 23, 24, and 25) are reverse-scored. The original scale demonstrated satisfactory internal consistency reliability, with a Cronbach's alpha coefficient of .83.

Translation Procedure

The translation and cultural adaptation of the Academic Self-Regulation Scale (ASRS) were conducted using a standardized multi-step procedure informed by the World Health Organization's guidelines for cross-cultural instrument adaptation to ensure semantic and conceptual equivalence (World Health Organization [WHO], 2013).

First, the original English version of the ASRS was independently translated into Thai by bilingual translators who are native Thai speakers with expertise in psychology and education. The translated versions were compared and synthesized into a preliminary Thai version through discussion and consensus.

Next, the preliminary Thai version was back-translated into English by independent bilingual translators who were blinded to the original instrument. The back-translated version was then compared with the original ASRS to evaluate semantic, conceptual, and linguistic equivalence. Any discrepancies were carefully reviewed and resolved to ensure that the Thai items accurately reflected the intended meaning of the original scale.

An expert panel, comprising bilingual professionals who were not involved in the translation process and who had backgrounds in psychology and educational measurement, reviewed the translated items for clarity, cultural appropriateness, and content relevance. Minor revisions were made based on the panel's feedback. Following expert review, the preliminary Thai version underwent pre-testing using cognitive interviewing with 10 Thai university students who were representative of the target population. The instrument was administered and followed by a debriefing process to assess participants' comprehension of the items, identify unfamiliar or inappropriate terms, and examine discrepancies between intended and actual interpretations. Feedback obtained from this phase was systematically documented and used to refine item wording where necessary.

Based on the preceding stages, the Thai-translated instrument was prepared for pilot testing with 45 respondents who were representative of the target population. Feedback derived from the pre-testing and cognitive interviewing phase was incorporated to identify and address any remaining discrepancies in item wording and clarity. The finalized version of the instrument was subsequently used for data collection in the main study.

Data Analysis

Data were analyzed using SPSS and AMOS software. Descriptive statistics, including means, standard deviations (SD), skewness, and kurtosis, were computed to examine item distributions and assess the normality of the Academic Self-Regulation Scale (ASRS-Thai) items.

Internal consistency reliability was examined using Cronbach's alpha. An Exploratory Factor Analysis (EFA) was first performed on the initial sample using Principal Component Analysis with Varimax rotation. Factor extraction was based on eigenvalues greater than 1.. PCA was selected as an initial

extraction method to explore the underlying component structure and to maximize the total variance explained during the preliminary validation phase.

Subsequently, a Confirmatory Factor Analysis (CFA) was conducted on an independent sample to test the proposed multidimensional measurement model of the ASRS-Thai. Model fit was assessed using multiple goodness-of-fit indices, including the Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), based on commonly recommended cutoff values (TLI ≥ .95 and RMSEA ≤ .08) (Hair et al., 2019).

Convergent validity was examined using Pearson's product–moment correlation coefficients between the ASRS-Thai and three theoretically related constructs: gratitude, measured by the Gratitude Questionnaire–6 (GQ-6; McCullough et al., 2002; Thai version: Chotima, 2015); academic self-efficacy, assessed using the College Self-Efficacy Inventory (CSEI; Solberg et al., 1993; Thai version: Doowa, 2023); and academic procrastination, measured by the Academic Procrastination Scale (McCloskey, 2012; Thai version: Doowa, 2023). In line with theoretical expectations, ASRS-Thai scores were expected to correlate positively with gratitude and academic self-efficacy, and negatively with academic procrastination. All statistical analyses were conducted using a significance level of $p < .05$.

Table 1 Descriptive Statistics of The Thai Version of the Academic Self-Regulation Scale (ASRS-Thai) (n = 200)

Item code	Item	Mean	SD	Skewness	Kurtosis
1	I always come five minutes before class time	4.620	0.842	-0.052	-0.593
2	I am well aware of Grade Point Average (GPA) system of assessment and evaluation	4.585	0.804	-0.046	-0.458
3	I know about the means through which my assessment will be made in semester system	4.675	0.856	-0.145	-0.376
4	I set goals for attaining grades in the class	4.565	0.848	-0.131	-0.324
5	I consciously make sure that my class attendance does not go below 80%	4.625	0.817	-0.214	-0.136
6	I can perform well all activities in the class assigned by the teacher	4.635	0.797	-0.210	-0.041
*7	I am not satisfied with my performance in the class	4.605	0.820	0.017	-0.275
8	I keep record of all class notes provided by the teachers	4.585	0.822	-0.139	-0.205
9	I always submit my written assignment to my teacher before other students in the class	4.620	0.793	-0.248	-0.002
*10	I work just to pass this course	4.645	0.814	-0.167	-0.152
11	I work to get first position in the class	4.615	0.812	0.191	-0.635

Table 1 (to)

Item code	Item	Mean	SD	Skewness	Kurtosis
12	I compete with high achievers among my class fellows	4.580	0.853	-0.154	-0.334
*13	I usually rely on cramming the learning material	4.610	0.782	-0.148	-0.011
14	I am regular in class because I am well aware of rules to be dropped from a course	4.655	0.818	-0.120	-0.489
*15	I am hesitant to speak English and to take part in class discussion in English language	4.585	0.778	0.295	-0.535
*16	I give up/ skip difficult parts of learning material provided.	4.550	0.878	-0.199	-0.230
17	I use highlighting, heading, chunking and other study helps in learning books and other materials	4.640	0.821	-0.127	-0.212
18	I usually study according to the study schedule set by myself	4.630	0.785	0.065	-0.498
19	I like to study in group because that enhances my learning ability	4.610	0.843	-0.072	-0.581
*20	I feel hesitant when I am asked to present assigned work in front of the class	4.640	0.808	-0.117	-0.162
21	Use of technical terms in the classroom learning is sometime difficult but helpful in understanding the subject	4.670	0.851	0.049	-0.746
22	I can search the reading material given as assignment by the instructor.	4.610	0.825	-0.032	-0.545
*23	I take part in classroom discussion only to get favor of teachers in grades	4.640	0.880	-0.032	-0.742
*24	I feel difficult to complete assignment given by the teacher in time	4.625	0.871	-0.205	-0.382
*25	Assignment method is very boring and useless in learning situation	4.635	0.840	-0.202	-0.247
26	My good performance in the class is due to my own efforts	4.670	0.784	0.150	-0.623
27	My good performance in the class is the result of teacher's motivation	4.655	0.824	0.119	-0.692
28	My good performance in the class is the support of my family and friends	4.550	0.890	-0.196	-0.288
29	I know about the promotion rules of semester system	4.690	0.841	-0.078	-0.628
30	I am aware of disciplinary rules and regulations of semester system	4.700	0.833	-0.021	-0.666

Note: * Items 7,10,13,15,16,20,23,24,25 are reverse scored, SD = Standard Deviation

Table 2 KMO and Bartlett's Test

Test	Value
Kaiser-Meyer-Olkin Measure of Sampling.	0.945
Adequacy	$x^2(435) = 3682.520, p < .001$
Bartlett's Test of Sphericity	

Table 3 Factor Loading and Communalities from Principal Component Analysis of the Thai Version of the Academic Self-Regulation Scale (ASRS-Thai) (n = 200)

Items	Factors					h^2
	1	2	3	4	5	
ASRS 1	0.732					0.601
ASRS 4	0.779					0.733
ASRS 5	0.679					0.633
ASRS 6	0.743					0.674
ASRS 8	0.665					0.608
ASRS 9	0.718					0.618
ASRS 10	0.748					0.636
ASRS 11	0.678					0.598
ASRS 12	0.817					0.735
ASRS 14	0.654					0.610
ASRS 2		0.775				0.649
ASRS 3		0.741				0.646
ASRS 21		0.753				0.647
ASRS 27		0.773				0.690
ASRS 28		0.732				0.630
ASRS 29		0.757				0.681
ASRS 30		0.712				0.643
ASRS 13			0.744			0.632
ASRS 16			0.730			0.670
ASRS 17			0.785			0.685

Table 3 (to)

Items	Factors					h^2
	1	2	3	4	5	
ASRS 19			0.732			0.671
ASRS 22			0.745			0.707
ASRS 24			0.716			0.642
ASRS 25			0.755			0.647
ASRS 7				0.781		0.726
ASRS 15				0.741		0.693
ASRS 20				0.754		0.724
ASRS 18					0.796	0.751
ASRS 23					0.688	0.703
ASRS 26					0.691	0.671
Eigen value	12.299	2.720	2.324	1.360	1.249	66.505
Percent of variance extracted	40.996	9.065	7.747	4.532	4.164	

Table 4 Reliability Analysis of the Thai Version of the Academic Self-Regulation Scale (ASRS-Thai)

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ASRS1	0.605	0.948
ASRS2	0.537	0.949
ASRS3	0.591	0.948
ASRS4	0.719	0.947
ASRS5	0.710	0.947
ASRS6	0.688	0.947
ASRS7	0.499	0.949
ASRS8	0.670	0.947
ASRS9	0.654	0.948
ASRS10	0.637	0.948
ASRS11	0.641	0.948

Table 4 (to)

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ASRS12	0.667	0.947
ASRS13	0.566	0.948
ASRS14	0.693	0.947
ASRS15	0.518	0.949
ASRS16	0.631	0.948
ASRS17	0.559	0.948
ASRS18	0.503	0.949
ASRS19	0.629	0.948
ASRS20	0.555	0.948
ASRS21	0.545	0.949
ASRS22	0.620	0.948
ASRS23	0.592	0.948
ASRS24	0.593	0.948
ASRS25	0.516	0.949
ASRS26	0.575	0.948
ASRS27	0.606	0.948
ASRS28	0.586	0.948
ASRS29	0.613	0.948
ASRS30	0.632	0.948
	Full scale reliability	**0.950**

Table 5 Standardized Factor Loadings from Confirmatory Factor Analysis of the Thai Version of the Academic Self-Regulation Scale (ASRS-Thai)

Items	Standardized factor loading ("β")				
	ASR_1	ASR_2	ASR_3	ASR_4	ASR_5
ASRS1	0.690				
ASRS4	0.759				
ASRS5	0.755				
ASRS6	0.780				
ASRS8	0.738				
ASRS9	0.735				
ASRS10	0.654				
ASRS11	0.650				
ASRS12	0.786				
ASRS14	0.793				
ASRS2		0.696			
ASRS3		0.770			
ASRS21		0.734			
ASRS27		0.814			
ASRS28		0.756			
ASRS29		0.804			
ASRS30		0.797			
ASRS13			0.737		
ASRS16			0.778		
ASRS17			0.745		
ASRS19			0.788		
ASRS22			0.781		
ASRS24			0.787		
ASRS25			0.739		
ASRS7				0.774	
ASRS15				0.737	
ASRS20				0.774	
ASRS18					0.809
ASRS23					0.788
ASRS26					0.780

Note. ASR_1–ASR_5 represent the five latent factors of the Academic Self-Regulation Scale. All factor loadings are standardized and statistically significant ($p < .001$).

Table 6 Model Fit Indices for the One – Factor CFA Model (n = 700)

Discrepancy X^2	*Df*	P	CMIN/DF	GFI	TLI	CFI	RMSEA
1008.216	388	<0.001	2.598	0.900	0.946	0.951	0.048

Note: CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation

Table 7 Convergent Validity Indicators for the Thai version of the Academic Self-Regulation Scale (ASRS-Thai) (n = 700)

Constructs	Convergence		
	AVE	CR	α
ASRS	0.503	0.835	0.95

Note: AVE = Average Variance Extracted; CR = Composite Reliability; α = Cronbach's alpha.

Table 8 Pearson Correlations Between Total Score of Thai version of the Academic Self-Regulation Scale (ASRS), Gratitude (GQ-6), College Self-Efficacy Inventory (CSEI) and Academic Procrastination Scale (APS) (n = 700)

Construct Pair	Pearson correlation (*r*)
Academic Self-regulation Scale (ASRS Thai) - Gratitude (GQ-6 Thai)	.219***
Academic Self-regulation Scale (ASRS Thai) - College Self-Efficacy Inventory (CSEI Thai)	.268***
Academic Self-regulation Scale (ASRS Thai) - Academic Procrastination Scale (APS Thai)	-.220***

Note: All correlation analyses were performed using the total scores of the respective scales.
*** = p < .001

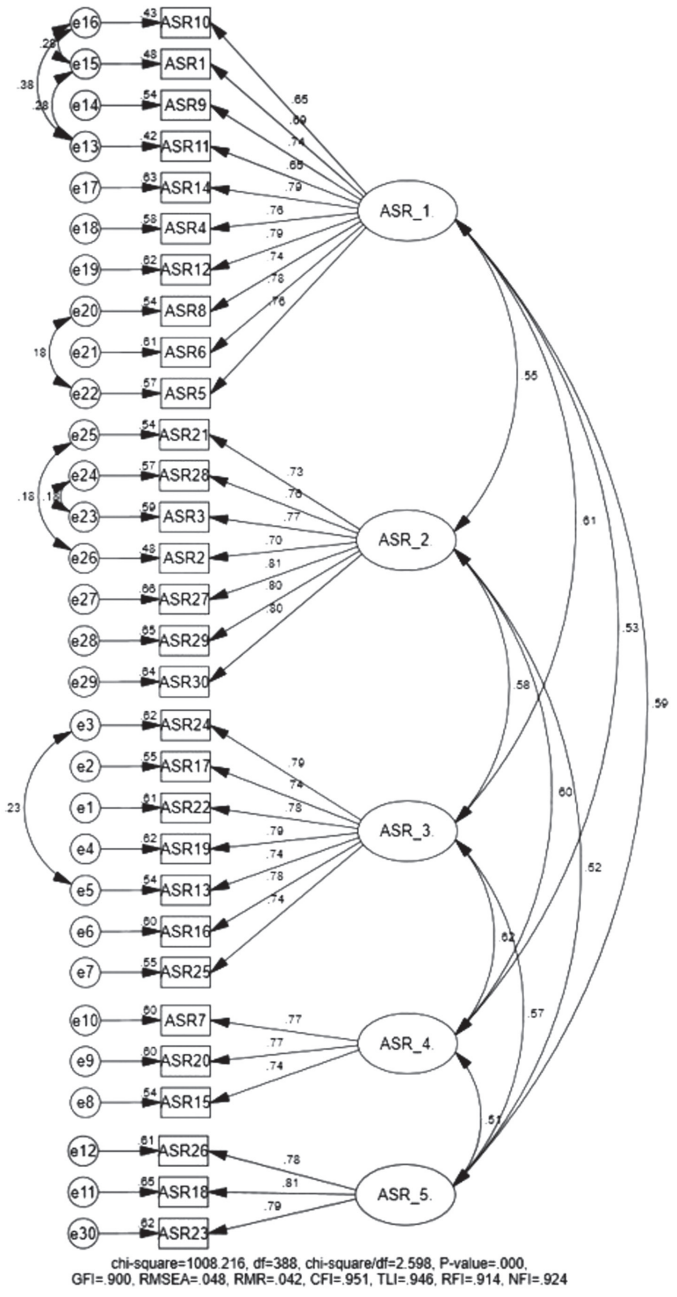


Figure 2 Standardized Path Diagram of the CFA Model for the Thai Version of the Academic Self-regulation Scale

RESULTS CONCLUSION

The present study aimed to examine the psychometric properties of the Thai version of the Academic Self-Regulation Scale (ASRS-Thai) among Thai university students.

Objective 1: Examination of the Factor Structure

Descriptive statistics indicated that items of the Thai version of the Academic Self-Regulation Scale (ASRS) demonstrated relatively high mean scores, suggesting that participants generally reported a high level of academic self-regulation. Skewness and kurtosis values for all items were within acceptable

ranges (±2), supporting the assumption of normality and the suitability of the data for further multivariate analyses (Hair et al., 2019).

The data were deemed appropriate for factor analysis, as evidenced by a high Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy (KMO = 0.945) and a statistically significant Bartlett's Test of Sphericity, $X^2(435) = 3682.520$, $p < .001$ (Table 2). These results indicate adequate inter-item correlations and support the use of factor analytic techniques.

Exploratory Factor Analysis (EFA) conducted on the first sample (n = 200) supported a five-factor structure consistent with the original theoretical model of the ASRS-Thai. The five factors collectively explained 66.51% of the total variance. All retained items demonstrated substantial factor loadings on their respective factors, and communalities indicated adequate shared variance among the items, supporting the multidimensional structure of academic self-regulation as conceptualized by Akhtar and Mahmood (2013).

Objective 2: Reliability Assessment

Reliability analysis revealed excellent internal consistency for the ASRS-Thai. The Cronbach's alpha coefficient for the full scale was .95, and corrected item–total correlations exceeded the recommended threshold, indicating strong homogeneity and internal coherence of the scale.

Confirmatory Factor Analysis (CFA) was subsequently conducted on an independent sample (n = 700) to validate the five-factor measurement model identified in the EFA. The CFA results demonstrated that all items loaded significantly on their respective latent factors, with standardized factor loadings (β) ranging from .65 to .81, exceeding the recommended minimum cutoff of .50 (Hair et al., 2019). The model exhibited a good fit to the data, as indicated by the following fit indices: $X^2(388) = 1008.216$, $p < .001$, CMIN/DF = 2.598, GFI = .900, TLI = .946, CFI = .951, and RMSEA = .048. Collectively, these indices suggest that the proposed five-factor model provided an adequate representation of the data.

Objective 3: Construct Validity Assessment

Evidence of convergent validity was further supported by the Average Variance Extracted (AVE = .503), Composite Reliability (CR = .835), and Cronbach's alpha (α = .95), indicating that the latent construct of academic self-regulation was measured with satisfactory reliability and internal consistency. In addition, Pearson correlation analyses demonstrated significant positive correlations between the total score of the ASRS-Thai and GQ 6 -Thai ($r = .219$, $p < .001$) as well as CSEI -Thai ($r = .268$, $p < .001$), and a significant negative correlation with APS - Thai ($r = -.220$, $p < .001$). These findings provide further support for the construct validity of the Thai version of the ASRS and are consistent with theoretical expectations and prior research on academic self-regulation.

Overall Conclusion

Overall, the results provide strong empirical support for the reliability and validity of the ASRS - Thai. The scale demonstrated a stable five-factor structure, excellent internal consistency, and meaningful

associations with theoretically related constructs, indicating that the ASRS -Thai is a psychometrically sound instrument for assessing academic self-regulation among Thai university students.

DISCUSSION

The present study examined the psychometric properties of the ASRS-Thai among Thai university students. Overall, the findings provide strong support for the reliability and construct validity of the ASRS -Thai, indicating that it is a psychometrically sound and culturally appropriate instrument for assessing academic self-regulation in the Thai higher education context.

Exploratory Factor Analysis supported a multidimensional structure consistent with the original theoretical framework proposed by Akhtar and Mahmood (2013), reflecting core components of self-regulated learning, including self-planning, self-monitoring, self-instruction, self-evaluation, and self-reaction. The adequacy of the factor solution was further supported by a high Kaiser–Meyer–Olkin value and a significant Bartlett's test of sphericity, indicating that the data were suitable for factor analysis. Confirmatory Factor Analysis conducted on an independent sample demonstrated good model fit and substantial standardized factor loadings, providing evidence for the stability of the factor structure across samples. These findings suggest that the multidimensional nature of academic self-regulation can be meaningfully applied within the Thai university context.

In terms of reliability, the ASRS-Thai demonstrated satisfactory to excellent internal consistency across its subscales and total score. These findings are comparable to those reported in the original ASRS and prior validation studies of psychological scales in the Thai context, suggesting that the translated items consistently capture academic self-regulation constructs among Thai university students. Although the Cronbach's alpha coefficient for the full scale was high (.95), which indicates excellent reliability, it may also suggest some degree of item overlap or redundancy. Future studies may consider refining items or developing a shorter version of the scale while maintaining adequate content coverage.

Furthermore, evidence for construct validity was supported by meaningful associations between academic self-regulation and theoretically related variables, including academic self-efficacy and academic procrastination, in directions consistent with existing literature. Although these correlations were moderate in magnitude, this pattern may indicate that academic self-regulation is meaningfully associated with related constructs while remaining conceptually distinct. In addition, the Average Variance Extracted (AVE = .503) slightly exceeded the commonly recommended threshold of .50, indicating acceptable convergent validity. Nevertheless, future refinement of some indicators may further strengthen the construct representation.

Taken together, the findings indicate that the ASRS-Thai is a reliable and valid instrument for assessing academic self-regulation in Thai university students. The availability of this culturally adapted measure contributes to research on self-regulated learning in non-Western contexts and provides

educators, counselors, and researchers with a useful tool for identifying students' self-regulatory strengths and difficulties within Thai higher education settings.

SUGGESTIONS AND RECOMMENDATIONS

Several limitations of the present study should be acknowledged. First, the use of convenience sampling may limit the representativeness of the sample. Second, participants were recruited only from Nakhon Pathom Province, which may restrict the generalizability of the findings to students in other regions of Thailand. Third, the cross-sectional design does not allow causal inferences regarding the relationships among academic self-regulation and related constructs. Fourth, principal component analysis was employed in the exploratory phase, and future studies may consider common factor analysis methods to further examine the latent structure of the scale.

Based on the findings of the present study, several recommendations can be proposed for future research and practical applications. First, the ASRS-Thai demonstrated satisfactory psychometric properties among Thai university students in Nakhon Pathom Province; however, future studies should examine its applicability across different regions of Thailand and diverse student populations. Replication studies involving students from various academic disciplines, institutional types, and educational levels would help strengthen the generalizability of the scale's factor structure and reliability.

Second, although this study established the construct validity of the ASRS-Thai through its associations with related variables, future research is encouraged to further examine its predictive validity. Longitudinal designs could be employed to investigate whether academic self-regulation, as measured by the ASRS-Thai, predicts important academic outcomes such as academic achievement, persistence, and psychological well-being over time. Such designs would provide stronger evidence for the temporal stability and practical utility of the scale.

Third, from an applied perspective, the ASRS-Thai may be utilized by educators, counselors, and mental health professionals as a screening and assessment tool to identify students with difficulties in academic self-regulation. The scale can inform the development of targeted academic support programs and interventions aimed at enhancing self-regulatory skills, which are known to be protective factors against maladaptive academic behaviors such as procrastination.

Finally, future intervention studies may integrate the ASRS-Thai as an outcome measure to evaluate the effectiveness of educational or psychological interventions designed to promote self-regulated learning. Incorporating culturally sensitive interventions within the Thai higher education context may further contribute to improving students' academic functioning and overall adjustment.

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