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Academic procrastination behavior among college undergraduates: Structural Equation Modeling (SEM)

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Article Info

Abstract

The aim of this study was to develop and examine the causal model of academic procrastination behavior of college undergraduates using structural equation modeling (SEM). Sample were 611 college undergraduates at one public university in the eastern region of Thailand. The sample was selected by multi-stage random sampling technique. The results revealed that the proposed theoretical model of academic procrastination behavior fitted well with the empirical data by adding the path effect from self-efficacy for self-regulated learning to academic self-efficacy. Results were discussed from relevant theoretical viewpoints and empirical findings for implications.

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Introduction

Academic procrastination behavior is a behavioral sequence of postponement of the important academic activities for an academic achievement (Pourabdol, Sobhi-Gharamaleki, & Abbasi, 2015). Academic procrastination behavior is a widespread phenomenon in the academic world (Liu, 2010) as shown in the study that 83 percent of adolescents and university students reported more than one hour procrastinating each day (Klassen & Kuzucu, 2008). Academic procrastination behavior has a significant and negative influence on learning and achievement of university students (Kader, 2014). Besides academic achievement, academic procrastinators also experience state of emotional upset, shame and guilt (Martinčeková & Enright, 2020).

Previous studies have shown the effects from both situational factors and psychological factors influencing academic procrastination behavior; however, no research studies have examined the influence of both situational factors and psychological factors on academic procrastination behavior in the same model. Therefore, to bridge the gap between psychological factors and situational factors, the researcher was interested to examine the effects from situational factors (instructor support and class organization), the effects from psychological traits (perfectionism and self-esteem), and effects from psychological states (academic self-efficacy and self-efficacy for self-regulated learning), influencing academic procrastination behavior through a structural equation modelling (SEM) based on the interactionism theory.

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Literature Review

Bhanthumnavin (1998, 1997) as cited in Bhanthumnavin (2007) stated that the interactionism model is the main idea about the causal variables of human behavior and concluded that the causes of human behavior were situational factors, psychological traits, interaction between situational factors and psychological traits, and psychological states.

Academic procrastination behavior refers to intentionally putting off doing academic work that must be completed (Schraw, Wadkins, & Olafson, 2007). Academic procrastination behavior is the behavior that is linked to a specific task considered as a form of situational procrastination (Harris & Sutton, 1983).

Instructor support may be defined as emotional or personal support as the instructors are perceived as warm and caring, including academic support as how helpful an instructor is perceived when it comes to providing academic assistance (Patrick, Kaplan, & Ryan, 2011). Instructor support will lead college students to experience a positive influence on their psychological state of development (Nielsen, Newman, Smyth, Hirst, & Heilemann, 2016). The study by Corkin, Yu, Wolters, and Wiesner (2014) found that self-efficacy mediated the effect of instructor support on procrastination.

The conceptualization of class organization covers the course content, instructor expectations, and evaluation criteria (Winston et al., 1994 as cited in Corkin, 2012). The qualitative study of Grunschel, Patrzek, and Fries (2013) reported that students also indicated unorganized and lax teachers to be a reason for their procrastination, whereas the study by Corkin et al. (2014) revealed that instructors with high expectations had been found to increase students' class enjoyment and interest and to reduce student procrastination. Furthermore, this study found that self-efficacy mediated the effect of instructor organization on procrastination.

Within an academic context, self-efficacy is frequently described in terms of academic self-efficacy, which defines a student's judgements about one's ability to achieve an academic task or a specific academic goal (Elias & MacDonald, 2007). The studies found a significant negative relationship between academic self-efficacy and procrastination (Melton, 2013; Chang, 2018).

Self-efficacy for self-regulated learning is defined as the individuals' beliefs in their capability to use self-regulatory strategies effectively for achieving their learning goals (Usher & Pajares, 2008). The study by Klassen and Kuzucu (2008) found that self-efficacy for

self-regulated learning showed a strong inverse relationship with and was the strongest predictor of procrastination for students.

Perfectionism is a complex characteristic and a multidimensional personality character as striving for flawlessness and setting exceedingly high standards of performance accompanied by being obsessively critical with self-evaluations (Stoeber, 2018). The study by Mohammed, Sherit, Eissa, and Mostafa (2013) indicated that self–oriented perfectionism was a significant positive predictor of academic procrastination. Moreover, the study by Seo (2008) found self-efficacy mediated the relationship between procrastination and perfectionism.

Self-esteem refers to an individual's sense of his or her value or worth, or the extent to which a person values, approves of, appreciates, prizes, or likes himself or herself (Blascovich & Tomaka, 1991). The study by Lekich (2006) found a significant negative correlation between self-esteem and procrastination, while the study by Batool, Khursheed, and Jahangir (2017) revealed that academic self-efficacy fully mediated the relationship between self-esteem and academic procrastination

Methodology

Participants

Participants were recruited during Spring 2020 semester at one big university in the eastern region of Thailand. The sample were 623 college undergraduates who volunteered to complete a questionnaire. The sample was selected by multi-stage random sampling technique. Stratified sampling was used in stage 1 by dividing the entire population according to the educational field and using the field of study as the strata. There were three fields of study which were humanities and social sciences, health science, and science. Random sampling was used in stage 2 by random sampling the faculties in each stratum. Random sampling also was used in stage 3 by random sampling the 2 classes in each sampling faculty. Missing values, outliers and normal distribution of all measured variables were examined to purify the data. After data screening, 611 participants were used in the analyses as the sample.

Data Collection

This study was approved by the Ethics and Research Standardization Section prior to conducting the study. The students in the class were approached by an invitation

message and the participant information message asking them for volunteering to complete the online questionnaire by scanning the QR code.

Measurement

This study consisted of different instruments to measure different variables. The back-translation procedure was applied to all instruments. All instrument used a 5-point Likert scale. Academic procrastination behavior instrument adapted the 4 dimensions of Academic Procrastination Scale (APS) created by McCloskey (2011). The modified instrument after validity and reliability testing consisted of 16 items (α = .924). Instructor support instrument adapted instructor support dimension of classroom climate scale of Corkin (2012). The modified instrument after validity and reliability testing consisted of 12 items (α = .934). Class organization instrument adapted class organization dimension of classroom climate scale of Corkin (2012). The modified instrument after validity and reliability testing consisted of 10 items (α = .886). Academic self-efficacy instrument adapted 2 dimensions the College Self-Efficacy Inventory (CSEI) created by Solberg, O'Brien, Villareal, Kennel, and Davis (1993). The modified instrument after validity and reliability testing consisted of 13 items (α = .926). Self-efficacy for self-regulated learning instrument adapted Self-regulated Learning Scale created by Zimmerman, Bandura, and Martinez-Pons (1992). The modified instrument after validity and reliability testing consisted of 8 items (α = .922). Perfectionism instrument adapted Self-Oriented Perfectionism dimension of Multidimensional Perfectionism Scale created by Hewitt and Flett (1991). The modified instrument after validity and reliability testing consisted of 15 items (α = .895). Self-esteem instrument adapted Rosenberg's Self-Esteem Scale (SE) created by Rosenberg (1965 as cited in Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). The modified instrument after validity and reliability testing consisted of 10 items (α = .768).

Data Analysis

The data were analyzed by using statistical software. From the initial measurement models, there were 4 considered multidimensional measurement models, which were instructor support, class organization, academic self-efficacy and academic procrastination behavior. These models were examined by exploratory factor analysis following with confirmatory factor analysis. There were 3 considered unidimensional measurement models which were perfectionism, self-esteem, and self-efficacy for self-regulated learning. These models were examined by confirmatory factor analysis. From EFA, principal component analysis was used to extract the factors and remove some items that weaken the measure of the main factors including cross loading items. Then, to assess the convergent and discriminative validity of the revised instruments, confirmatory factor analysis (CFA) was conducted. Lastly, the structural path analysis was conducted by using structural equation modeling (SEM).

Results

To evaluate the convergent and discriminative validity of all 7 measurements and fit of the model as a whole, evaluation was done by using goodness-of-fit indices and the degree of fit between the model and the sample including norm chi-square (χ^2 /df: < 5.0 indicating acceptable; Schumacker & Lomax, 2004), Comparative Fit Index (CFI: > .90 indicating good fit; Hair, Black, Babin, & Anderson, 2010), Norm Fit Index (NFI: > .90 indicating good fit; Bentler & Bonett, 1980), Non-Norm Fit Index (NNFI: > .90 indicating good fit; Bentler & Bonett, 1980), Rooth Mean Square Error of Approximation (RMSEA: .03–.08 indicating good fit; Hair et.al., 2010), Standard Root Mean Square Residual (SRMR: < .05 indicating good fit; Kelloway, 1998, as high as 0.08 is acceptable; Hu & Bentler, 1999), Goodness of Fit Index (GFI: > .90 indicating good fit; Kelloway, 1998), and Adjusted Goodness of Fit Index (AGFI: > .90 indicating good fit; Kelloway, 1998).

Measurement Model

Confirmatory Factor Analysis (CFA)
As shown in Table 1, the result from CFA indicated that the revised measurements were good validity in measuring instructor support, class organization, perfectionism, self-esteem, academic self-efficacy, self-efficacy for self-regulated learning and academic procrastination behavior. The details are explained in Table 1.

The Structural Model

The full model was tested. In Table 2, standardized covariance among latent variables in the structural equation model are shown. In Figure 1, variance in all dependent variables, the standardized path coefficients, and goodness-of-fit indices are explained.

Table 1   Reliability and factor loadings of the latent variables

Observed Variables	Item	Construct Reliability (CR)	Factor loading
Instructor support (insup)[b]	10	.907	.503**–.859**
χ^2/df = 3.840, CFI = .983, NNFI = .977, RMSEA = .075, SRMR = .035, GFI = .952			
Class organization			
Evaluation (evalu)	3	.340	.583**
Class content (ccont)	3	.946	.973**
Instructor expectation (expec)	3	.988	.994**
χ^2/df = 4.328, CFI = .983, NNFI = .961, RMSEA = .080, SRMR = .037, GFI = .963			
Perfectionism (soperf)[b]	14	.838	.328**–.720**
χ^2/df = 4.216, CFI = .967, NNFI = .954, RMSEA = .072, SRMR = .049, GFI = .940			
Self-esteem (globse)[b]	9	.848	.390**–.792**
χ^2/df = 4.976, CFI = .980, NNFI = .965, RMSEA = .080, SRMR = .048, GFI = .964			
Academic self-efficacy[a]			
Study efficacy (study)	3	.895	.946**
Assignment efficacy (assign)	3	.974	.987**
Academic/social efficacy (acdsoc)	5	.353	.594**
χ^2/df = 2.268, CFI = .982, NNFI = .973, RMSEA = .051, SRMR = .038, GFI = .970			
Self-efficacy for self-regulated learning (sesrl)[b]	8	.748	.408**–.604**
χ^2/df = 3.232, CFI = .987, NNFI = .979, RMSEA = .060, SRMR = .034, GFI = .977			
Academic procrastination behavior[a]			
Distractions (distract)	5	.706	.840**
Social factors (soc)	3	.455	.674**
Laziness (laz)	4	.986	.993**
Time management (tmgt)	3	.343	.586**
χ^2/df = 2.577, CFI = .075, NNFI = .970, RMSEA = .058, SRMR = .047, GFI = .940			

Note: a = second order confirmatory factor analysis; b = first order confirmatory factor analysis.
**p < .01.

Table 2   Standardized covariance among latent variables in the structural equation model
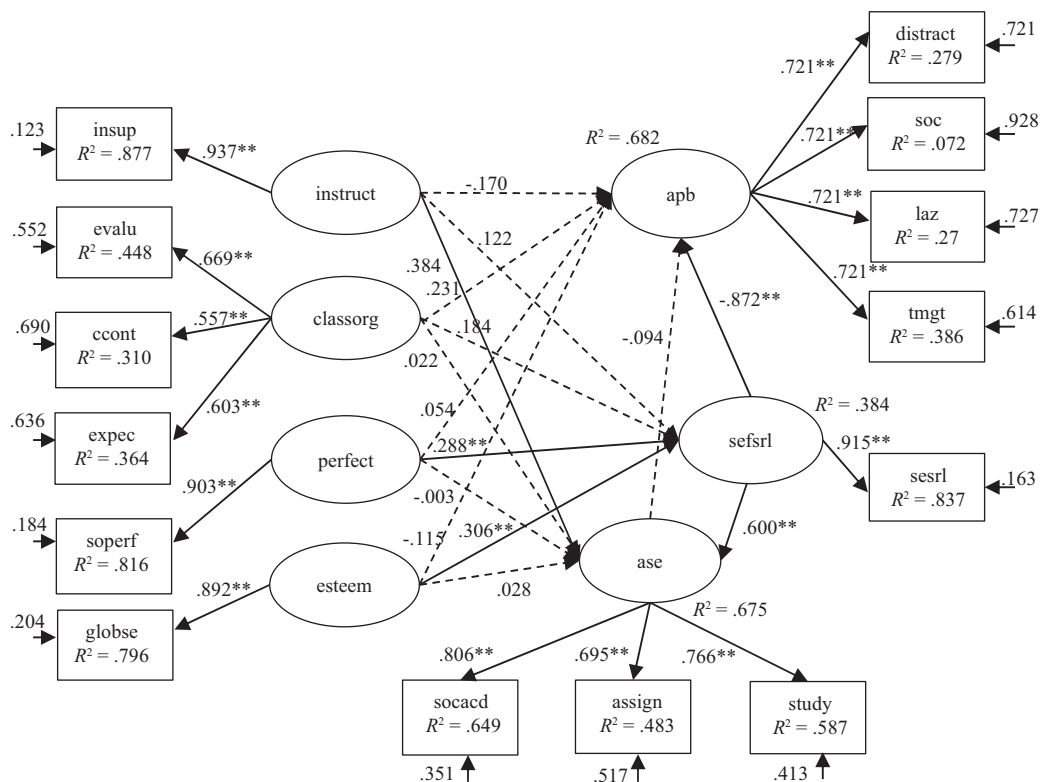
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
distract	.587													
soc	.317	.774												
laz	.366	.374	.609											
tmgt	.152	.083	.168	.411										
study	-.147	-.083	-.140	-.175	.397									
assign	-.113	-.117	-.118	-.111	.219	.425								
socacd	-.092	-.061	-.086	-.091	.158	.183	.636							
sesrl	-.141	-.067	-.140	-.091	.142	.127	.121	.483						
insup	-.057	-.034	-.073	-.086	.123	.154	.355	.098	.550					
evalu	-.037	-.029	-.025	-.073	.094	.118	.213	.043	.285	.595				
ccont	-.015	-.096	-.054	-.025	.072	.118	.134	.061	.207	.216	.510			
expec	-.005	-.062	-.042	-.032	.109	.122	.178	.079	.243	.227	.358	.566		
globse	-.171	-.110	-.166	-.173	.224	.191	.213	.152	.134	.100	.085	.101	.332	
soperf	-.048	-.028	-.087	-.061	.094	.088	.078	.106	.039	.022	.049	.074	.119	.328

Note: insup = instructor support; evalu = evaluation; ccont = class content; expec = instructor expectation; soperf = self-oriented perfectionism; globse = global self-esteem; socacd = social/academic self-efficacy; assign = assignment self-efficacy; study = study self-efficacy; sesrl = self-efficacy for self-regulated learning; distract = distractions; soc = social factors; laz = liziness; tmgt = time management.

Table 3 Direct, indirect, and total effects of variables on academic procrastination behavior

	ase			sefsrl			apb		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
ase	–	–	–	–	–	–	.011	–	.011
sefsrl	.573**	–	.573**	–	–	–	-.821**	.006	-.815**
instruct	.359**	.099*	.459**	.173*	–	.173*	-.128	-.137	-.265*
classorg	.018	.067	.085	.116	–	.116	.208	-.095	.114
perfect	-.021	.173**	.153**	.302**	–	.302**	.086	-.246**	-.161*
esteem	.000	.172**	.172**	.300**	–	.300**	-.057	-.244**	-.301**

*Note: – = effect not included in the model; ** = significant at the .01 level (2-tailed); * = significant at the .05 level (2-tailed).*

χ^2 = 221.982, df = 54, *p* = .000, GFI = .951, AGFI = .906, SRMR = .052, RMSEA = .071,
NFI = .951, NNFI = .936, CFI = .962, χ^2/df = .926

Figure 1 The latent variable structure model of academic procrastination behavior (*n* = 611)
Note: insup = instructor support; instruct = instructor support; evalu = evaluation; ccont = class content; expec = instructor expectation; classorg = class organization; soperf = self-oriented perfectionism; perfect = perfectionism; globse = global self-esteem; esteem = self-esteem; socacd = social/academic self-efficacy; assign = assignment self-efficacy; study = study self-efficacy; ase = academic self-efficacy; sesrl = self-efficacy for self-regulated learning; sefsrl = self-efficacy for self-regulated learning; distract = distractions; soc = social factors; laz = liziness; tmgt = time management; apb = academic procrastination behavior.

According to the data analysis, the path from self-efficacy for self-regulated learning to academic self-efficacy was added to the hypothesized latent variable model as suggested by the modification index, and the structural model of academic procrastination behavior fit with the empirical data under the criteria of RMSEA was .071, indicating an acceptable to good fit. CFI was .962, NFI was .951, and NNFI was .936, all exceeding the cut off criterion of .90 which indicated the good fit. The chi-square ($\chi2$) was 221.982 ($p = .000.$), however normed chi-square ($\chi2$ /df) of 4.111 indicated an acceptable model fit. GFI was .951, AGFI was .906, both exceeding the cut off criterion of .90, but SRMR was .052 almost meeting the criteria of .05. Therefore, the fit of the full structural model as a whole was considered to be good.

Four of six variables contributed to the explanation of the variance in academic procrastination behavior significantly, namely, self-efficacy for self-regulated learning (total effect = -.815**), self-esteem (total = -.301**), instructor support (total effect = -.265*), and perfectionism (total effect = -.161*). Four of five variables contributed to the explanation of the variance in academic self-efficacy significantly, namely, self-efficacy for self-regulated learning (total effect = -.573**), instructor support (total effect = -.459*), self-esteem (total = -.172**), and perfectionism (total effect = -.153*). Three of four variables contributed to the explanation of the variance in self-efficacy for self-regulated learning significantly, namely, perfectionism (total effect = -.302**), self-esteem (total = -.300**), and instructor support (total = -.173**). Only one variable had the largest negative direct effect on academic procrastination behavior significantly, namely, self-efficacy for self-regulated learning (direct effect = -.821, $p \leq .01$,). This means that a college undergraduate who obtains high self-efficacy for self-regulated learning results in low academic procrastination behavior due to the negative effect.

Although, perfectionism, self-esteem had insignificant direct effect on academic procrastination behavior, both variables had significant total effect due to the significant indirect effect through mediating variable, namely, self-efficacy for self-regulated learning, while instructor support had both insignificant direct and indirect effect, but had significant total effect. Therefore, self-efficacy for self-regulated learning was proven to be a relevant mediating variable to academic procrastination behavior.

Discussion

This study was the first study on academic procrastination behavior based on the interactionism model. The results of this study found that self-efficacy for self-regulated learning had a significant role as predictor and mediator to academic procrastination behavior, which followed with the interactionism model, because it's a psychological state which is the result in the current situation combined with the psychological trait of the individual that is the characteristic that support as a mediator for both psychological trait and situational factors. Besides, the psychological state is closely related to behavior, so this supports the most powerful predictor (Bhanthumnavin, 2007). Students who have a high self-efficacy for self-regulated learning believe that they do well in a set of strategies including planning and organizing academic work, structuring a productive study environment, overcoming distractions, and participating in class as the basis for self-efficacy for self-regulated learning as cited in (Zimmerman et al., 1992). They then might feel confident to take action to do academic work and do not procrastinate Therefore, students possessing self-regulatory efficacy procrastinated much less than other students (Tan et al., 2008).

The results also showed that the proposed theoretical model of academic procrastination behavior with adding the path effect from self-efficacy for self-regulated learning to academic self-efficacy fitted with the empirical data. The self-efficacy for self-regulated learning also showed positive direct effect on academic self-efficacy significantly. Therefore, enhancing the self-efficacy for self-regulated learning might bring about academic self-efficacy more. This result was consistent with the study by Joo, Bong, and Choi (2000) which revealed that students' self-efficacy for self-regulated learning positively related to Korean students' academic self-efficacy. Moreover, the study by Tavakolizadeha and Qavamb (2011) provided the training in self-regulated learning strategies to 2nd grade middle-school boys. The results showed that the training of self-regulated learning strategies increased self-efficacy.

Conclusion and Recommendation

This study examined the academic procrastination behavior among college undergraduates through a structural equation modeling based on the Interactionism model. The findings from the model revealed that the

negative effects from self-esteem, instructor support and perfectionism influenced academic procrastination behavior significantly through self-efficacy for self-regulated learning as the full mediator. Moreover, only self-efficacy for self-regulated learning had a statistically significant negative direct effect on academic procrastination behavior. Therefore, a training program should be developed to foster self-efficacy for self-regulated learning in order to treat the academic procrastination behavior among college undergraduates.

Conflict of Interest

There is no conflict of interest.

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