

Exploring Factors Related to Taiwanese Adolescent Students' Academic Attributes and Engagement

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Abstract

The purpose of the present study was to examine the relationships among Taiwanese adolescent students' perceptions of parental expectations along with parental criticism, satisfaction of the needs for autonomy and competence, implicit theories of intelligence, perfectionist tendencies, and academic procrastination in order to acquire a comprehensive understanding of the mechanisms related to students' academic attributes and engagement. Four hundred and five eighth grade Taiwanese students completed a self-reported survey assessing the variables described above. Findings of hierarchical regression analyses suggested that parental expectations, parental criticism, and competence need satisfaction significantly predicted implicit theories of intelligence. In terms of perfectionistic tendencies, parental expectations and competence need satisfaction positively predicted positive striving (i.e., personal standards and organization), whereas parental criticism emerged as a negative predictor of positive striving. Further, parental expectations, parental criticism, and an entity theory of intelligence positively predicted evaluative concerns (i.e., concerns over mistakes and doubts about actions). With respect to academic procrastination, results of hierarchical regressions revealed that parental influences, satisfaction of the needs for competence, and perfectionistic tendencies all functioned as determinants of academic procrastination. Implications for educational practices and future research are discussed.

Keywords: academic procrastination, implicit theories of intelligence, perfectionism, autonomy need satisfaction, competence need satisfaction

1. Introduction

It has been found that many adolescent students experience declines in academic engagement over the course of secondary school (Eccles & Roeser, 2009). For example, findings of a longitudinal study (Wang, Chow, Hofkens, & Salmela-Aro, 2015) suggested that Finnish adolescents found school less enjoyable and less valuable as they moved from 9th to 11th grade. The quality of their engagement in school diminished and they became overwhelmed as well as anxious over school during this period of time. Also, a cross-cultural study found that the quality of motivational beliefs for both China and American students declined from 7th to 8th grade (Wang & Pomerantz, 2009). An increase in teacher control and discipline was found in middle and high school classrooms (Eccles et al., 1993). In Taiwan, the pressures to perform well in schoolwork are even more intense due to cultural values. The pursuit of examination success has turned Taiwanese classrooms into settings focused largely on the preparation for examinations. These practices are thought to lead to decreased academic engagement and motivation among adolescent students (Shih, 2012, 2015).

Academic procrastination can be regarded as an indication of declined engagement, because procrastinators tend to lack goal orientation and a motivated, planful approach to learning (Klassen, Krawchuk, & Rajani, 2008; Steel, 2007). Academic procrastination refers to an irrational tendency to delay in the completion of an academic task, even to the point of creating emotional discomfort and anxiety (Lay & Schouwenburg, 1993; Sénécal, Julien, & Guay, 2003; Solomon & Rothblum, 1984). Students may intend to perform an academic activity within the expected or desired time frame, yet failing to motivate themselves to carry out the intention.

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Academic procrastination has been found to be linked to a variety of negative outcomes including poor academic performance, missing or late assignments, cramming, use of self-handicapping strategies, and difficulties in following directions (Dewitte & Schouwenburg, 2002; Lee, 2005; Solomon & Rothblum, 1984; Tice & Baumeister, 1997). Approximately 50% of college students procrastinate on academic tasks consistently. The vast majority of research on academic procrastination has thus focused on college student samples. There is shortage of studies examining academic procrastination among adolescent students. To address the paucity, the present study attempted to explore factors related to Taiwanese junior high students' academic procrastination.

1.1 Perfectionism

Perfectionism is a common personality characteristic that can have influences on all aspects of life (Stoeber & Stoeber, 2009). Previous findings indicated that such perfectionistic features as fear of failure and evaluation anxiety were closely related to procrastination (Beck, Koons, & Milgrim, 2000; Burnam, Komarraju, Hamel, & Nadler, 2014). As a multidimensional personality disposition, perfectionism is characterized by striving for flawlessness and setting exceedingly high standards of performance accompanied by overly critical evaluation of one's behavior (Stoeber, 2018). The constant self-criticism arising from failures to live up to the high standards can precipitate guilt, shame, and worthlessness, which may result in procrastination (Dunkley, Blankstein, Masheb, & Grilo, 2006).

Built on the conceptualization of perfectionism as a multidimensional construct, Frost, Marten, Lahart, and Rosenblate (1990) proposed a model differentiating six dimensions of perfectionism. The first dimension, personal standards, reflects perfectionists' high standards of performance. Another major dimension is concern over mistakes. This component captures perfectionists' fear about making mistakes and the consequences that mistakes have for their self-evaluation. The third dimension is doubts about actions. It measures the extent of an individual's confidence in his or her ability to complete tasks. The fourth dimension captures tendencies to be organized and value order and neatness. The fifth and sixth dimensions assess the theorized root of perfectionism, parental expectations and parental criticism. Unlike the above dimensions reflecting the intrapersonal aspects of perfectionism, these two components are considered interpersonal (Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005). Parental expectations and parental criticism refer to perfectionists' perceptions that their parents expect them to be perfect and were critical if they fail to meet the expectations (Stoeber, 2018).

With respect to the intrapersonal aspects of perfectionism, Frost and colleagues (Frost, Holt, Mattia, & Neubauer, 1993) labeled personal standards together with organization "positive striving" and concern over mistakes along with doubts about actions "maladaptive evaluation concerns." Positive striving is associated with motivation to approach success, whereas maladaptive evaluation concern may bring about motivation to avoid failure (Slade & Owens, 1998). Hope of success and fear of failure is thought to contrarily affect the way in which students engage in schoolwork. Positive striving is linked to a preference for challenging tasks and the desire to work hard.

The productive engagement stemming from positive striving may buffer students from procrastination (Burnam et al., 2014; Stoeber & Rambow, 2007). In contrast, maladaptive evaluation concerns are likely to lead students to interpret mistakes as equivalent to failure (Solomon & Rothblum, 1984). In the present study, the effects of each dimension of perfectionism on academic procrastination were examined in order for a thorough understanding of the nature of the relationships. Also, this study explored other likely predictors of adolescents' academic procrastination including implicit theories of intelligence and satisfaction of basic psychological needs. It was hoped that an investigation into the interrelationships among these factors would provide a clear picture of the important determinants related to Taiwanese adolescent students' academic attributes.

1.2 Implicit Theories of Intelligence

In addition to perfectionistic tendencies, students' implicit theories of intelligence have provided a lens through which academic procrastination may be understood. Implicit theories refer to one's deeply held but rarely articulated thoughts about the nature of intelligence (Dweck, 2000; Molden & Dweck, 2000). Entity theorists hold the view that intelligence is a fixed entity that cannot be altered, whereas incremental theorists believe that intelligence is malleable and can be increased. These different views about intelligence often guide individuals to interpret and react to achievement situations differently. The belief that intelligence is fixed orients entity theorists to interpret negative performance outcomes as indicators of intellectual inadequacy.

The implied negative evaluation of the self hence may cause serious anxiety. These concerns are likely to lead entity theorists to engage in procrastination for concealing incompetence. In contrast, because incremental theorists view intelligence as malleable, unsatisfactory performance may signify that their ability would be improved through further attention and effort. Performance setbacks are supposed to inspire incremental theorists to adopt active and constructive coping instead of procrastination to attain improvement (Dweck & Molden, 2005; Molden & Dweck, 2006).

The belief that intelligence cannot be developed overtime raises entity theorists' competence concerns. Competence concerns refer to one's worry about embarrassment from looking incompetent in the eyes of others (Ryan, Patrick, & Shim, 2005). Continued failure following effort expenditure is especially likely to threaten one's sense of self-worth because of the implication of low ability (Covington & Beery, 1976). Given that perfectionists' maladaptive evaluative concerns are characterized by fear of failure (Solomon & Rothblum, 1984), entity theorists may very likely be vulnerable to maladaptive perfectionism.

The present research was also intended to examine the relationships between implicit theories and perfectionism in order that the effects of different views about intelligence on each aspect of perfectionism would be clearly determined. Moreover, some researchers (Dweck & Molden, 2005; Grolnick, 2001) speculated that being autonomy supportive was associated with lower levels of endorsement of an entity theory and thereby ameliorated the orientation toward such avoidance strategies as procrastination. Accordingly, the role of students' satisfaction of basic psychological needs (i.e., autonomy and competence need satisfaction) in these variables of interest was examined as well.

1.3 Satisfaction of Need for Autonomy and Competence

There is evidence that students' motivation and engagement are mainly determined by the extent to which their basic psychological needs are met (Eccles et al., 1993). Self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2000) provides a framework for understanding human tendencies toward active engagement and development. According to SDT, the satisfaction of three basic needs (i.e., the needs for autonomy, competence, and relatedness) is critical for growth of people's personality and cognitive structures (Deci & Ryan, 2000). Autonomy refers to the need to experience one's behavior as freely chosen and volitional. Competence refers to the need to feel efficacious while interacting with the social environment, such as completing a learning task. Relatedness refers to the need to feel connected to significant others. SDT posits that a sense of autonomy constitutes an important psychological resource for dealing with stressful demands. The resource enables one to appraise objective stressors as challenges rather than threats. When students undertake demanding tasks with higher levels of autonomy, they are inclined to employ adaptive coping to overcome obstacles. It may be inferred that adaptive coping arising from autonomy need satisfaction, in turn, helps to ease students' procrastination.

Another crucial factor that may be closely related to students' academic procrastination concerns whether their needs for competence are satisfied. Competence need satisfaction constitutes the underlying process of control (Bandura, 1997; Weiner, 1986). Previous findings showed that one's sense of control over desired and undesired outcomes largely affected how he or she responded to stressful situations (Folkman, 1984; Skinner & Edge, 2002). Individuals with confidence in their ability to overcome obstacles tended to perceive failures and stressors as challenges and therefore to use problem-solving to tackle difficulties. By contrast, those who lacked a sense of competence were prone to panic when faced with setbacks and to use avoidance coping to escape the stressor if possible (Bandura, 1997; Dweck, 2000; Skinner, 1995). These students are thought to be at risk for academic procrastination. Deci (1975) suggested that the combined senses of autonomy and competence critically influenced one's intrinsic motivation and effort expenditure for academic tasks. The current study was intended to explore the relationships of autonomy and competence need satisfaction with academic procrastination, implicit theories, as well as perfectionism. In doing so, it was hoped that the effects of satisfaction of these two types of psychological needs on students' motivation and engagement would be detected.

1.4 The Present Study

In summary, the purpose of the present study was to examine the relationships among parental expectations, parental criticism, satisfaction of the needs for autonomy and competence, implicit theories of intelligence, perfectionistic tendencies, and academic procrastination in order to acquire a comprehensive understanding of the mechanisms related to Taiwanese adolescent students' academic attributes and engagement.

Specifically, this study was devised to test the following hypotheses: (a) Students' perceived parental expectations, parental criticism, and satisfaction of the needs for autonomy and competence would significantly predict their implicit theories of intelligence (i.e., incremental and entity theories); (b) Students' perceived parental expectations, parental criticism, satisfaction of the needs for autonomy and competence, and implicit theories of intelligence would significantly predict each aspect of their perfectionistic tendencies; (c) Students' perceived parental expectations, parental criticism, satisfaction of the needs for autonomy and competence, implicit theories of intelligence, and perfectionistic tendencies would significantly predict their academic procrastination.

2. Method

2.1 Participants

The participants included 405 eighth-grade Taiwanese students from twelve classes in four junior high schools. Participating schools were located in the northern part of Taiwan. All of school principals granted initial consent for data to be collected in their schools. The 219 boys (54%) and 186 girls ranged in age from 13 years to 14 years, 9 months ($M = 13$ years, 8 months, $SD = 4$ months). The school districts were primarily middle class in terms of socioeconomic status. All of the participants were Taiwanese. Guidelines for the proper treatment of human subjects were followed (APA, 2010). Students' participation was voluntary. All participants had parental consent to take part in the study. Confidential treatment of the data was guaranteed.

2.2 Procedure

The data were collected at the beginning of the eighth grade. Students were invited to fill out a survey (described in detail below) during regular class time. There were two research assistants in each class for the data collection. They assured students of the confidentiality of their self-reports and encouraged them to respond to all items as accurately as possible.

2.3 Measures

Participants were instructed to respond to all items using a five-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). A Chinese language version of this self-report survey was used. All measures utilized in the present study were translated into Chinese and then back-translated into English. To ensure adequate translation, guidelines of the International Test Commission (Hambleton, 1994) were followed. Specifically, the translation process took account of linguistic and cultural qualities among Taiwanese adolescents. Participants' familiarity with item format, item content, and test procedures was ensured by checking with two Taiwanese junior high students during the translation process. Also, statistical techniques were selected to establish the equivalence of the different language versions of the measure. Information on the reliability and validity of the adapted versions is detailed below.

2.3.1 Perfectionism. Students' perfectionistic tendencies were assessed by the scale adapted from the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990). This scale measures perfectionism across six dimensions including personal standards (e.g., "I set higher goals than most people"; 4 items; $a = .79$), organization (e.g., "I try to be an organized person"; 5 items; $a = .86$), concern over mistakes (e.g., "People will probably think less of me if I make a mistake"; 4 items; $a = .76$), doubts about actions (e.g., "I usually have doubts about the simple everyday things I do"; 3 items; $a = .60$), parental expectations (e.g., "My parents set very high standards for me"; 5 items; $a = .85$), and parental criticism (e.g., "My parents never tried to understand my mistakes"; 4 items; $a = .70$). The subscales of personal standards, organization, concern over mistakes, and doubts about actions were employed in the current study to measure perfectionistic expectations the student has for him- or herself. Higher scores represented a higher level of perfectionistic tendencies. The remaining two subscales (i.e., parental expectations and parental criticism), on the other hand, were used to measure aspects of an individual's experiences with his or her parents.

2.3.2 Academic procrastination. Students' tendencies to academic procrastination were assessed by the Academic Procrastination Questionnaire (Huang, 2009). This scale was originally developed to measure college students' inclinations of procrastination in different academic situations. Because the current study was devised to investigate junior high students' academic procrastination, very few items were modified according to adolescent students' experiences in schools. The adapted academic procrastination questionnaire consists of two subscales. The scale of procrastination on homework was intended to measure students' procrastination behaviors when doing homework (e.g., "I usually wait until the last minute to start my homework"; 6 items; $a = .90$).

The scale of procrastination on preparing for the examination was developed to measure students' tendencies to procrastinate on preparation when the examination is approaching (e.g., "While preparing for the examination, I usually procrastinate on carrying out my study plan"; 6 items; $a = .86$). These two subscales were then combined to create the academic procrastination measure ($r = .88$, $p < .001$; $a = .93$). Higher scores represented a higher level of academic procrastination.

2.3.3 Satisfaction of the basic psychological needs. Students' satisfaction of the basic psychological needs was assessed by the scale adapted from the Basic Need Satisfaction at Work Scale (Baard, Deci, & Ryan, 2004). This scale measures the extent to which students experience satisfaction of their needs for autonomy, competence, and relatedness.

In the present study, the subscales measuring autonomy (e.g., "I feel like I can pretty much be myself in my classroom"; 4 items; $a = .77$) and competence need satisfaction (e.g., "Most days I feel a sense of accomplishment from learning"; 4 items; $a = .76$) were used. Higher scores represented a higher level of satisfaction of the needs for autonomy or competence.

2.3.4 Implicit theories of intelligence scale. Students' implicit theories of intelligence were assessed by the Theories of Intelligence Scale (Dweck, 2000). The scale is composed of two four-item subscales of the incremental (e.g., "You can always substantially change how intelligent you are"; $\alpha = .74$) and entity theories (e.g., "Your intelligence is something about you that you can't change very much"; $\alpha = .84$). Higher scores represented a higher level of tendency to adopt the particular type of implicit theory of intelligence.

3. Results

3.1 Regression Analyses

Descriptive information and correlations for study variables are shown in Table 1. Results from regression analyses are presented first for outcomes regarding students' implicit theories of intelligence and then for their perfectionistic tendencies and academic procrastination. In the preliminary analysis, gender was entered first in regression models. Results of the preliminary analysis suggested that gender failed to predict any outcome variable of interest. Accordingly, gender was not included as a predicting variable in the present study.

In the hierarchical regression analyses predicting incremental and entity theories of intelligence, parental expectations and parental criticism were entered as predictors in block 1 and satisfaction of needs for autonomy and competence were entered in block 2. For the outcomes regarding perfectionistic tendencies (i.e., personal standards, organization, concern over mistakes, and doubts about actions), parental expectations and criticism were entered in block 1. In block 2, autonomy and competence need satisfaction were entered in the regression models. In block 3, students' incremental and entity theories were included. In the hierarchical regression model predicting academic procrastination, parental expectations and criticism were entered in block 1. Students' satisfaction of needs for autonomy and competence were included in block 2. In block 3, implicit theories of intelligence were added. Finally, personal standards, organization, concern for mistakes, and doubts about actions were all entered in block 4.

Parental expectations and parental criticism were given higher priority of entry because this set of predictors was presumed to be causally prior to other variables of interest (Tabachnick & Fidell, 2007). The alpha level used to determine the significance of all of these analyses was set at .01. This more conservative alpha level was selected to reduce the possibility of making a Type I error resulting from completing a series of analyses with related outcomes (Tabachnick & Fidell, 2007).

Table 1: Descriptive Statistics and Correlations for Study Variables (N =405)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Parental expectations	—										
2. Parental criticism	.59**	—									
3. Autonomy need satisfaction	-.09	-.22**	—								
4. Competence need satisfaction	.11*	-.21**	.56**	—							
5. Incremental theory	.13**	.06	.24**	.43**	—						
6. Entity theory	.08	.31**	-.23**	-.35**	-.41**	—					
7. Personal standards	.38**	.07	.32**	.54**	.28**	-.11*	—				
8. Organization	.13**	-.11*	.40**	.53**	.33**	-.22**	.57**	—			
9. Concern over mistakes	.44**	.46**	-.18**	-.05	-.08	.24**	.38**	.09	—		
10. Doubts about actions	.41**	.42**	-.09**	-.08	-.03	.20**	.28**	.10	.54**	—	
11. Academic procrastination	.02	.28**	-.32**	-.38**	-.19**	.28**	-.29**	-.37**	.09	.24**	—
<i>M</i>	2.92	2.62	3.84	3.08	3.16	2.09	3.00	3.38	2.30	2.84	2.71
<i>SD</i>	1.01	.95	.91	.89	.87	.92	.95	.90	.91	.86	.89

Note. * $p < .05$. ** $p < .01$.

3.2 Hierarchical Regressions Predicting Implicit Theories of Intelligence

3.2.1 Incremental theory of intelligence. Results of hierarchical regressions predicting students’ implicit theories of intelligence are displayed in Table 2. Parental expectations and criticism were entered in the first regression model and accounted for a significant amount of variance (5%) in incremental theory of intelligence, $F(2, 402) = 9.42, p < .001$. Parental expectations positively predicted incremental theory of intelligence, $\beta = .25, p < .001$, whereas parental criticism was negatively associated with this type of implicit theory, $\beta = -.21, p < .001$. In Step 2, students’ satisfaction of needs for autonomy and competence were included in the model. Adding these variables increased the amount of variance explained for incremental theory by 14%, $F(4, 400) = 23.34, p < .001$. Results from this step suggested that when other predictors were controlled for, competence need satisfaction positively predicted incremental theory, $\beta = .40, p < .001$.

3.2.2 Entity theory of intelligence. The amount of variance (12%) explained by parental expectations and criticism in the first step of the analysis was significant for entity theory of intelligence, $F(2, 402) = 26.20, p < .001$. Parental expectations negatively predicted entity theory, $\beta = -.17, p < .01$. In contrast, parental criticism emerged as a positive predictor of entity theory, $\beta = .41, p < .001$. Adding autonomy and competence need satisfaction in Step 2 increased the amount of variance explained for entity theory by 7%, $F(4, 400) = 22.54, p < .001$. When other variables were controlled for, competence need satisfaction negatively predicted entity theory, $\beta = -.26, p < .001$.

Table 2: Summary of Hierarchical Regression Analyses Predicting Implicit Theories of Intelligence (N= 405)

Variable	Incremental theory			Entity theory		
	β	<i>t</i>	ΔR^2	β	<i>t</i>	ΔR^2
Step 1			.05			.12
Parental expectations	.25***	4.18		-.17**	-2.87	
Parental criticism	-.21***	-3.41		.41***	7.05	
Step 2			.14			.07
Parental expectations	.10	1.77		-.07	-1.10	
Parental criticism	-.03	-.49		.29***	4.82	
Autonomy need satisfaction	.02	.39		-.03	-.53	
Competence need satisfaction	.40***	6.87		-.26***	-4.56	

Note. ** $p < .01$. *** $p < .001$.

3.3 Hierarchical Regressions Predicting Perfectionistic Tendencies

3.3.1 Personal standards. Table 3 shows results of hierarchical regressions predicting students' perfectionistic tendencies. Variables entered in Step 1 (i.e., parental expectations and criticism) predicted a significant amount of variance (18%) in personal standards, $F(2, 402) = 44.53, p < .001$. Parental expectations positively predicted personal standards, $\beta = .52, p < .001$, whereas parental criticism functioned as a negative predictor, $\beta = -.24, p < .001$. Results from the second step of the analysis indicated that adding autonomy and competence need satisfaction increased the amount of variance explained for personal standards by 22%, $F(4, 400) = 68.30, p < .001$. When other variables were accounted for, competence need satisfaction was positively related to this dimension of perfectionistic tendencies, $\beta = .44, p < .001$. Results from Step 3 indicated that adding implicit theories of intelligence failed to significantly increase the amount of variance explained for this predicted variable.

3.3.2 Organization. The amount of variance (7%) explained by parental expectations and criticism in the first step of the analysis was significant for organization, $F(2, 402) = 15.23, p < .001$. Parental expectations were positively related to organization, $\beta = .30, p < .001$. Conversely, parental criticism emerged as a negative predictor of organization, $\beta = -.29, p < .001$. Adding satisfaction of needs for autonomy and competence in the second step increased the amount of variance explained for organization by 24%, $F(4, 400) = 44.84, p < .001$. When other variables were controlled for, both autonomy and competence need satisfaction positively predicted organization, $\beta = .16, p < .001$ and $\beta = .41, p < .001$, respectively. In Step 3, incremental and entity theories of intelligence were included in the model. Adding these variables failed to significantly increase the amount of variance explained for organization.

3.3.3 Concern over mistakes. Parental expectations and parental criticism were entered in the first regression model and accounted for a significant amount of variance (26%) in concern over mistakes, $F(2, 402) = 69.02, p < .001$. Parental expectations and criticism both emerged as positive predictors of concern over mistakes, $\beta = .26, p < .001$ and $\beta = .30, p < .001$, respectively. Results from Step 2 indicated that adding autonomy and competence need satisfaction failed to significantly increase the amount of variance explained for concern over mistakes. Adding implicit theories of intelligence increased the amount of variance explained for concern over mistakes by 2%, $F(6, 398) = 26.69, p < .001$. When other variables were taken into account, entity theory of intelligence positively predicted this aspect of perfectionistic tendencies, $\beta = .13, p < .01$.

3.3.4 Doubts about actions. The amount of variance (22%) explained by parental expectations and criticism in the first step of the analysis was significant for doubts about actions, $F(2, 402) = 55.63, p < .001$. Both parental expectations and criticism were positively correlated with doubts about actions, $\beta = .24, p < .001$ and $\beta = .28, p < .001$, respectively. Adding satisfaction of needs for autonomy and competence in the second step failed to increase the amount of variance explained for doubts about actions. In the final step, implicit theories of intelligence were included in the model. Adding these variables, again, failed to increase the amount of variance explained for doubts about actions.

Table 3: Summary of Hierarchical Regression Analyses Predicting Perfectionistic Tendencies (N= 405)

Variable	Personal standards			Organization			Concern over mistakes			Doubts about actions		
	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Step 1			.18			.07			.26			.22
Parental expectations	.52***	9.31		.30***	5.00		.26***	4.95		.24***	4.37	
Parental criticism	-.24**	-4.23		-.29***	-4.84		.30***	5.67		.28***	5.17	
Step 2			.22			.24			.02			.00
Parental expectations	.35***	6.91		.14**	2.48		.25***	4.49		.26***	4.49	
Parental criticism	-.02	-.36		-.07	-1.23		.29***	5.17		.26***	4.48	
Autonomy need satisfaction	.10	2.14		.16***	3.21		-.12	-2.29		.02	.39	
Competence need satisfaction	.44***	8.99		.41***	7.76		.05	.91		-.06	-1.07	
Step 3			.00			.01			.02			.01
Parental expectations	.35***	6.88		.12	2.26		.27***	4.80		.27***	4.60	
Parental criticism	-.04	-.70		-.07	-1.16		.25***	4.40		.23***	3.88	
Autonomy need satisfaction	.10	2.17		.16***	3.18		-.12	-2.22		.02	.45	
Competence need satisfaction	.45***	8.47		.37***	6.51		.11	1.90		-.03	-.52	
Incremental theory	.04	.95		.12	2.46		-.06	-1.27		-.01	-.14	
Entity theory	.05	.07		.01	.10		.13**	2.63		-.10	1.94	

Note. ** $p < .01$. *** $p < .001$.

3.4 Hierarchical Regressions Predicting Academic Procrastination

In terms of academic procrastination, parental expectations and criticism were entered in Step 1 and predicted a significant portion of variance (11%), $F(2, 402) = 25.39, p < .001$. Parental expectations negatively predicted academic procrastination, $\beta = -.22, p < .001$. In contrast, parental criticism was positively associated with students' delay of the completion of academic tasks, $\beta = .41, p < .001$. Adding autonomy and competence need satisfaction increased the amount of variance explained for academic procrastination by 9%, $F(4, 400) = 25.36, p < .001$. Results from this step suggested that when other predictors were controlled for, both autonomy and competence need satisfaction functioned as negative predictors of academic procrastination, $\beta = -.15, p < .01$ and $\beta = -.21, p < .001$, respectively.

In Step 3, incremental and entity theories of intelligence were entered. Adding this variable failed to increase the amount of variance explained for academic procrastination. In the final step, students' different perfectionistic tendencies were included in the model. Results from Step 4 showed that adding perfectionistic tendencies increased the amount of variance explained for academic procrastination by 8%, $F(10, 394) = 16.33, p < .001$. When other predictors were taken into consideration, organization negatively predicted academic procrastination, $\beta = -.19, p < .001$. On the contrary, doubt about actions positively predicted academic procrastination, $\beta = .26, p < .001$. Parental criticism remained to be a significant predictor of academic procrastination. Results of hierarchical regressions predicting students' academic procrastination were presented in Table 4.

Table 4: Summary of Hierarchical Regression Analyses Predicting Academic Procrastination (N= 405)

Variable	Academic Procrastination		
	β	t	ΔR^2
Step 1			0.11
Parental expectations	-.22***	-3.83	
Parental criticism	.41***	7.11	
Step 2			0.09
Parental expectations	-0.13	-2.3	
Parental criticism	.29***	4.81	
Autonomy need satisfaction	-.15**	-2.7	
Competence need satisfaction	-.21***	-3.7	
Step 3			0.01
Parental expectations	-0.13	-2.18	
Parental criticism	.25***	4.14	
Autonomy need satisfaction	-.14**	-2.65	
Competence need satisfaction	-.18**	-3.03	
Incremental theory	0.01	0.12	
Entity theory	0.12	2.24	
Step 4			0.08
Parental expectations	-0.11	-1.78	
Parental criticism	.19**	3.16	
Autonomy need satisfaction	-0.11	-2.12	
Competence need satisfaction	-0.03	-0.52	
Incremental theory	0.03	0.65	
Entity theory	0.11	2.2	
Personal standards	-0.14	-2.16	
Organization	-.19***	-3.46	
Concern over mistakes	-0.07	-1.26	
Doubts about actions	.27***	5	

Note. ** $p < .01$. *** $p < .001$.

4. Discussion and Conclusion

Findings of the present research help to elucidate the factors that may determine adolescent students' implicit theories of intelligence, perfectionistic tendencies, and academic procrastination within the Taiwanese context. The research on academic procrastination has primarily been confined to college students samples.

There is a need to extend this line of research by investigating students' academic attributes and procrastination in the pre-college years. Results of the current study suggest that parental expectations, parental criticism, and competence need satisfaction emerge as significant predictors of implicit theories of intelligence. In terms of perfectionistic tendencies, parental expectations along with competence need satisfaction positively predict positive striving (i.e., personal standards and organization), whereas parental criticism emerges as a negative predictor of positive striving. Further, both parental expectations and criticism positively predict evaluative concerns (i.e., concerns over mistakes and doubts about actions). An entity theory of intelligence positively predicts concerns over mistakes, too. With respect to the predictors of academic procrastination, results of hierarchical regressions reveal that parental influences, satisfaction of the needs for competence, and perfectionistic tendencies all function as determinants of academic procrastination. Below, several important findings are discussed in more detail.

4.1 Factors Related to Implicit Theories of Intelligence

Results of the hierarchical regression analyses indicate that parental expectations are positively related to an incremental theory and negatively related to an entity theory. Conversely, parental criticism positively predicts an entity theory and negatively predicts an incremental theory. Students who perceive that their parents set high standards for them tend to hold an incremental view of ability.

In contrast, parental attitudes toward children's behaviors characterized by blame and criticism appear to be positively linked to the view that intelligence is a fixed entity that cannot be altered. Also, parental criticism is likely to undermine the view that intelligence is malleable and can be increased. In addition to parental influences, competence need satisfaction is positively associated with an incremental theory and negatively related to an entity theory.

When students' needs to feel efficacious are fulfilled, they tend to believe that ability can be improved through further attention and effort. In contrast, students who lack a sense of competence are prone to hold the view that ability is a fixed entity. Evidently, one's sense of control over the encountered tasks to a large extent determines how he or she views the nature of intelligence. A higher sense of control enables students to adopt the view that intelligence can be developed through learning and effort. Contrarily, a lack of sense of control may orient students toward the belief that intelligence cannot be developed overtime.

4.2 Factors Related to Perfectionistic Tendencies

Parental influences and satisfaction of basic psychological needs are found to significantly predict students' positive striving. Parental expectations are positively related to personal standards and organization, whereas parental criticism emerges as a negative predictor of these aspects of positive striving. In addition, competence need satisfaction positively predicts both personal standards and organization. Autonomy need satisfaction also functions as a positive predictor of organization. It is noteworthy that satisfaction of these basic psychological needs accounts for around a quarter of the variance in the two components of positive striving, indicating the crucial role of competence and autonomy in the development of these adaptive tendencies.

With regard to evaluative concerns, both parental expectations and parental criticism positively predict concern over mistakes and doubts about actions. As the theorized root of perfectionism, these two predictors explain nearly a quarter of the variance in the two aspects of evaluative concerns. Students' perceptions that their parents expect them to be perfect positively predict both positive striving and evaluative concerns. In other words, parental expectations are positively linked to all aspects of perfectionism. Nonetheless, unlike the negative relationships between parental criticism and positive striving, adolescents' perceptions that their parents are critical if they fail to meet the standards seem to enhance both components of evaluative concerns. These findings reveal that parental criticism may not only lead to students' concern over mistakes and doubts about actions, but may hamper the cultivation of personal standards and organization. The present findings suggest that implicit theories of intelligence fail to predict perfectionistic tendencies other than the significant effects of an entity theory on concern over mistakes. The belief that intelligence or ability cannot be developed through effort may intensify students' fear of making mistakes and the consequences that mistakes have for their self-worth.

In contrast to the significant effects of satisfaction of basic psychological needs on positive striving, autonomy and competence need satisfaction is found to be unrelated to evaluative concerns. Put differently, fulfilling students' needs for autonomy and competence seems unable to alleviate their evaluative concerns.

4.3 Factors Related to Academic Procrastination

One of the primary purposes of the current research was to determine the predictors of adolescents' academic procrastination. Parental expectations and parental criticism play contradictory roles in students' procrastination. When students perceive that their parents expect them to perform well, they are less likely to put off completing homework or preparing for the examination. In contrast, parental criticism about students' failures to meet the expectations may lead them to engage in procrastination. It is likely that parental expectations per se may inspire adolescents to get started on leaning tasks. Parental criticism stemming from adolescents' failures to live up to the expectations, however, may cause them to procrastinate on finishing assignments. Further, the present findings reveal that meeting students' needs for competence and autonomy may lessen their tendencies to procrastinate. When students feel confident and engage in schoolwork with free will, they are less likely to delay in the completion of academic tasks.

Among intrapersonal aspects of perfectionism, organization and doubts about actions emerge as significant predictors of academic procrastination. As expected, organization negatively predicts procrastination. Students' tendencies to be organized and value order and neatness are thought to motivate them to use time effectively while working on academic tasks (Claessens, van Eerde, Rutte, & Roe, 2007). In turn, academic procrastination may be reduced. By contrast, students' doubts about actions are the very aspect of intrapersonal perfectionism that may lead to their tendencies to putting off finishing their homework or preparing for the examination.

As opposed to the negative effects of competence need satisfaction on academic procrastination, a lack of confidence in the ability to complete tasks may be the primary reason why students procrastinate. These findings clearly suggest that a sense of confidence is the key factor that determines whether or not students engage in academic procrastination.

4.4 Implications for Practices

On the basis of the present findings, to decrease adolescents' academic procrastination, parents should avoid criticism when children fail to meet their expectations. Results of the current study indicate that parental expectations may motivate adolescents to hold an incremental theory of intelligence and to set high standards of performance for themselves. Nevertheless, if children's failures to meet parental expectations are followed by parents' blame and criticism, students' tendencies to an entity view of intelligence, maladaptive evaluative concerns, and procrastination would likely arise.

Also, fulfilling adolescents' needs for competence and autonomy would be conducive to cultivating the trait of organization and moreover, to easing academic procrastination. To meet students' needs for competence, teachers are advised to provide structures in the classroom settings. Structure refers to the amount and clarity of information that teachers communicate to students about expectations and how those expectations can be realized. Teachers may provide structure for students by establishing goals, introducing procedures, giving directions, offering guidelines, and providing feedback (Jang, Reeve, & Deci, 2010). Additionally, students' needs for autonomy can be met by teachers' provision of autonomy support. Practices that may enhance students' autonomy include taking the student's perspective, allowing opportunities for self-initiation and choice, and acknowledging the student's feelings while minimizing the use of pressures and demands (Deci, Eghrari, Patrick, & Leone, 1994). Enacting the above practices is thought to heighten students' sense of competence and self-determination. Academic procrastination may, in turn, be reduced.

4.5 Limitations and Future Research

Although results of the present study provide insights into practices, there are several limitations that need to be addressed in the future research. First, findings of this study reveal that organization functions as a negative predictor of academic procrastination. Given that this aspect of perfectionism seems to be related to one's self-regulation such as self-management and goal setting, future research should examine the interrelationships among perfectionistic tendencies, the use of self-regulatory strategies, and academic procrastination. Second, a closer look at the results from hierarchical regressions suggests that perfectionistic tendencies appear to mediate the relationships between parental influences and students' academic procrastination. The regression procedure employed in the current study, nonetheless, does not allow the examination of the mediating relationships.

Future research using structure equation modeling to test path model is encouraged. Finally, the present research explores the role of satisfaction of adolescents' needs for autonomy and competence in their implicit theories of intelligence, perfectionistic tendencies, and academic procrastination. Future research should pay attention to the effects of social environment that may conducive to fulfilling these basic psychological needs (e.g., the classroom and family environments in which structure and autonomy support are provided). Results of such research may further our understanding of how social contexts can determine students' achievement-related attributes and behaviors and hence offer insights into effective intervention.

References

- American Psychological Association. (2010). *Ethical principles of psychologists and code of conduct*. Washington, DC: American Psychological Association.
- Baard, P. P., Deci, E. L., Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology, 34*, 2045-2068.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Beck, B. L., Koons, S. R., & Milgrim, D. L. (2000). Correlates and consequences of behavioral procrastination: The effects of academic procrastination, self-consciousness, self-esteem, and self-handicapping. *Journal of Social Behavior and Personality, 15*, 3-13.
- Burnam, A., Komarraju, M., Hamel, R., & Nadler, D. R. (2014). Do adaptive perfectionism and self-determined motivation reduce academic procrastination? *Learning and Individual Differences, 36*, 165-172.
- Claessens, B. J. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2007). A review of the time management literature. *Personnel Review, 36*, 255-276.
- Covington, M. V., & Beery, R. G. (1976). *Self-worth and school learning*. Oxford, England: Holt, Rinehart & Winston.
- Deci, E. L. (1975). *Intrinsic motivation*. New York, NY: Plenum Publishing.

- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality, 62*, 119-142.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and the “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268.
- Dewitte, S., & Schouwenburg, H. C. (2002). Procrastination, temptations, and incentives: The struggle between the present and the future in procrastinators and the punctual. *European Journal of Personality, 16*, 469-489.
- Dunkley, D. M., Blankstein, K. R., Maheb, R. M., & Grilo, C. M. (2006). Personal standards and evaluative concerns dimensions of “clinical” perfectionism: A reply to Shafran et al. (2002, 2003) and Hewitt et al. (2013). *Behaviour Research and Therapy, 44*, 63-84.
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.
- Dweck, C. S., & Molden, D. C. (2005). Self-theories: Their impact on competence motivation and acquisition. In A. J. Elliot, & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 122-140). New York: Guilford.
- Eccles, J., & Roeser, R. (2009). Schools, academic motivation, and stage-environment fit. In R. M. Lerner, & L. Steinberg (Eds.), *Handbook of adolescent psychology* (3rd ed.). (pp. 404-434). Hoboken, NJ: John Wiley & Sons.
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*, 839-852.
- Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences, 14*, 119-126.
- Frost, R. O., Marten, P., Lahart, C. M., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.
- Grolnick, W. S. (2001). *Discussant's comments: Symposium on influences on children's motivation: New concepts and new findings*. Paper presented at the Society for Research in Child Development, Minneapolis, MN.
- Hambleton, R. K. (1994). Guidelines for adapting educational and psychological tests: A progress report. *Bulletin of the International Test Commission, 10*, 229-244.
- Huang, C. E. (2009). *Self-efficacy for self-regulation, academic anxiety, and academic procrastination of college students: An examination of different academic situations and procrastinators* (Unpublished master's thesis). National Pingtung University, Pingtung, Taiwan.
- Jang, H., Reeve, J., & Deci, E. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*, 588-600.
- Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology, 33*, 915-931.
- Lay, C., & Schouwenburg, H. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality, 8*, 647-662.
- Lee, E. (2005). The relationship of motivation and flow experience to academic procrastination in university students. *The Journal of Genetic Psychology, 166*, 5-14.
- Molden, D. C., & Dweck, C. S. (2000). Meaning and motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 131-159). San Diego, CA: Academic Press.
- Molden, D. C., & Dweck, C. S. (2006). Finding meaning in psychology: A lay theories approach to self-regulation, social perception, and social development. *American Psychologist, 61*, 192-203.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78.
- Ryan, A. M., Patrick, H., & Shim, S. (2005). Differential profiles of students identified by their teacher as having avoidant, appropriate, or dependent help-seeking tendencies in the classroom. *Journal of Educational Psychology, 97*, 275-285.
- Sénechal, C., Julien, E., & Guay, F. (2003). Role conflict and academic procrastination: A self-determination perspective. *European Journal of Social Psychology, 33*, 135-145.
- Shih, S. (2012). An examination of academic burnout versus work engagement among Taiwanese adolescents. *Journal of Educational Research, 105*, 286-298.
- Shih, S. (2015). An examination of academic coping among Taiwanese adolescents. *Journal of Educational Research, 108*, 175-185.
- Skinner, E. A. (1995). *Motivation, coping, and control*. Newbury, CA: Sage.
- Skinner, E. A., & Edge, K. (2002). Self-determination, coping, and development. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 297-337). Rochester, NY: University of Rochester Press.
- Slade, P. D., & Owens, R. G. (1998). A dual process model of perfectionism based on reinforcement theory. *Behavior Modification, 22*, 372-390.

- Soenens, B., Vansteenkiste, M., Luyten, P., Duriez, B., & Goossens, L. (2005). Maladaptive perfectionistic self-representations: The mediational link between psychological control and adjustment. *Personality and Individual Differences, 38*, 487-498.
- Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology, 31*, 503-509.
- Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin, 133*, 65-94.
- Stoeber, J. (2018). The psychology of perfectionism: An introduction. In J. Stoeber (Ed.), *The psychology of perfectionism: Theory, research, applications* (pp. 3-16). London: Routledge.
- Stoeber, J., & Rambow, A. (2007). Perfectionism in adolescent school students: Relations with motivation, achievement, and well-being. *Personality and Individual Differences, 42*, 1379-1389.
- Stoeber, J., & Stoeber, F. S. (2009). Domains of perfectionism: Prevalence and relationships with perfectionism, gender, age, and satisfaction with life. *Personality and Individual Differences, 46*, 530-535.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed). Boston: Allyn and Bacon.
- Tice, D. M., & Baumeister, R. F. (1997). Longitudinal study of procrastination, performance, stress, and health: The costs and benefits of dawdling. *Psychological Science, 8*, 454-458.
- Wang, M., Chow, A., Hofkens, T., & Salmela-Aro, K. (2015). The trajectories of student emotional engagement and school burnout with academic and psychological development: Findings from Finnish adolescents. *Learning and Instruction, 36*, 57-65.
- Wang, Q., & Pomerantz, E. M. (2009). The motivational landscape of early adolescence in the United States and China: a longitudinal investigation. *Child Development, 80*, 1272-1287.
- Weiner, B. (1986). *An attribution theory of motivation and emotion*. New York: Springer-Verlag.