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Factors related to Taiwanese adolescents' academic procrastination, time management, and perfectionism

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ABSTRACT

There is a shortage of studies that explore adolescents' academic procrastination. The author hence attempted to examine the mechanisms determining Taiwanese adolescent students' perfectionistic tendencies, time management, and academic procrastination. A total of 405 eighth-grade Taiwanese students completed a self-reported survey assessing their perceptions of classroom structure, parental expectations and criticism, perfectionistic tendencies, time management, and academic procrastination. Findings of regression analyses indicated that parental expectations and criticism were the key predictors of students' adaptive and maladaptive perfectionism. Students' perceptions of classroom structure also positively predicted their adaptive perfectionism. Moreover, results of hierarchical regressions suggested that perceived classroom structure, parental expectations and criticism, as well as adaptive perfectionism all emerged as predictors of time management. With regard to procrastination on homework and examination preparation, parental expectations and adaptive perfectionism were negative predictors, whereas parental criticism and maladaptive perfectionism were positive predictors. Also, time management negatively predicted academic procrastination.

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Procrastination refers to an individual's intentional delay of an intended course of action, despite being aware of negative outcomes (Steel, 2007). As a universal human foible, procrastination is by no means an unusual phenomenon in academic context (Sénechal, Koestiner, & Vallerand, 1995). 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. Academic procrastination can be described as 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; Sénechal, Julien, & Guay, 2003; Solomon & Rothblum, 1984; Wolters, 2003). Procrastination appears to be a problem behavior for many college students. It has been estimated that 80–95% of college students engage in procrastination. Approximately 50% procrastinate on academic tasks consistently and problematically (Alexander & Onwuegbuzie, 2007; Klassen, Krawchuk, & Rajani, 2008; Steel, 2007). Academic procrastination can be troubling to these students because a range of studies have linked procrastination to negative outcomes including poor academic performance, missing or late assignments, cramming, anxiety during tests, use of self-handicapping strategies, and difficulties in following directions (Dewitte & Schouwenburg, 2002; Lay & Schouwenburg, 1993; Lee, 2005; Solomon & Rothblum, 1984; Tice & Baumeister, 1997). Procrastination also can result in damaging mental health outcomes such as depression and lower levels of self-esteem (Lay & Schouwenburg, 1993; Tice & Baumeister, 1997).

Despite the well-documented evidence of the negative impact of academic procrastination on learning and psychological well-being among students, the antecedents of procrastination are yet to be explored (Steel, 2007). Moreover, the vast majority of existing research focuses on college student samples. There is shortage of studies on academic procrastination among adolescent students. To address this paucity, the present study was intended to examine the likely predictors of Taiwanese junior high students' academic procrastination.

It has been suggested that fear of failure and evaluation anxiety are related to worry about receiving harsh appraisal. Such worry, in turn, may bring about procrastination (Beck, Koons, & Milgrim, 2000; Ellis & Knaus, 1977). Academic stress is common among Asian students due to familial and cultural demands for academic excellence. For example, the priority goal for Taiwanese junior high students is to obtain satisfactory scores on the entrance examination for senior high schools (Grades 10–12). The pursuit of examination success has turned classrooms into settings focused largely on the preparation for examinations (Biggs, 1994; Shih, 2012). Adolescents spend a large part of lives in school environment and often evaluate themselves on the basis of academic performance (Ang & Huan, 2006). Schools hence can be a stressful environment filled with fear of failure and test anxiety that may contribute to Taiwanese adolescent students' proclivity to procrastinate. It was hoped that an investigation into the antecedents of academic procrastination in adolescence within the Taiwanese school settings would further the knowledge of how to devise interventions to reduce adolescents' academic procrastination.

Perfectionistic tendencies

As stated previously, fear of failure and evaluation anxiety may lead students to put off getting started on academic work. Given that perfectionism is characterized by these attributes, students' perfectionistic tendencies are likely to constitute predictors of their academic procrastination (Burnam, Komarraju, Hamel, & Nadler, 2014; Solomon & Rothblum, 1984). Perfectionism has been generally conceptualized as an individual's dispositional tendency to set excessively high standards for performance and to define worth by the accomplishments of those standards. Additionally, individuals with high levels of perfectionism are inclined to evaluate their performance in an overly critical manner (Flett & Hewitt, 2002; Frost, Marten, Lahart, & Rosenblate, 1990; Pacht, 1984). The constant self-criticism arising from failures to live up to their previously set high standards can precipitate guilt, shame, and worthlessness, which may result in procrastination (Dunkley, Blankstein, Masheb, & Grilo, 2006; Frost et al., 1990; Pacht, 1984). Nevertheless, over the past two decades, theorists and researchers have begun to distinguish between maladaptive and adaptive perfectionism based on cumulative evidence (Bieling, Israeli, Smith, & Antony, 2003; Enns, Cox, & Clara, 2002; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). Adaptive perfectionism involves setting high personal standards and striving for success without psychological distress. Maladaptive perfectionism, in contrast, is linked to the concern over making mistakes. Individuals with maladaptive perfectionism tend to equate mistakes with failures and to worry that failure will lead to the loss of respect of others (Kawamura, Frost, & Harmatz, 2002). It was hence expected that maladaptive perfectionists would put off work until the last minute.

Built on the conceptualization of perfectionism as a multidimensional construct with both adaptive and maladaptive aspects, Frost et al. (1990) developed a validated and widely used measure of perfectionism termed the Multidimensional Perfectionism Scale. They identified six dimensions contributing to total perfectionism. The first dimension has been described as the central feature of perfectionism, namely, the setting of personal standards of performance. Another major dimension is concern over making mistakes. The third component is an individual's tendency to doubt the quality of his or her performance. It measures the extent of an individual's confidence in his or her ability to complete tasks. The fourth dimension measures a tendency to be organized. Among these components, high personal standards along with this emphasis on orderliness are regarded as features of adaptive perfectionism. By contrast, both concern over mistakes and doubts about actions reflect a self-critical orientation associated with maladaptive perfectionism (Bieling et al., 2003). The fifth and sixth dimensions assess the theorized root of perfectionism, high parental expectations and parental criticism. Unlike the above dimensions measuring the intrapersonal aspects of perfectionism, these components concerning the perceptions of parents' attitude are considered interpersonal (Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005).

The differentiation between adaptive and maladaptive perfectionism may primarily explain the differences in individuals' self-regulatory styles. Slade and Owens's (1998) dual process model of perfectionism suggests that adaptive perfectionism is associated with motivation to approach success, while

maladaptive perfectionism is likely to bring about motivation to avoid failure. Hope of success and fear of failure may contrarily affect the ways in which students engage in schoolwork. The setting of high personal standards clearly reveals a positive outlook on learning, which is related to a preference for challenging tasks and the desire to work hard (Blatt, D'Afflitti, & Quinlan, 1976; Stoeber & Rambow, 2007). Because of these characteristics, adaptive perfectionism is supposed to be linked with productive engagement that may buffer students from procrastination (Burnam et al., 2014). In contrast, maladaptive perfectionists' critical evaluation tendencies orient them to be overly concerned with mistakes and to interpret mistakes as equivalent to failure. The negative reactions to mistakes may give rise to such avoidance behaviors as academic procrastination to fend off failure (Solomon & Rothblum, 1984). The identification of two types of perfectionism can broaden the academic view of perfectionism that has been limited to the dysfunctional facets (Bieling, Israeli, & Antony, 2004). In the present study therefore I attempted to not only examine the relationships between students' perfectionistic tendencies and academic procrastination, but also explore the predicting factors of different types of perfectionism. The investigation was expected to provide valuable information on how perfectionism was at work in a non-Western academic context.

Perceived classroom structure

Because daily life experiences within social contexts produce recurrent approach and avoidance tendencies toward achievement (Elliot, 2006), in addition to perfectionism, students' perceptions of classroom structure may also influence their inclinations to procrastinate. Previous findings reveal that independent of fear of failure, students' sense of control over learning (i.e., their confidence in the abilities to complete academic tasks successfully) is directly linked to procrastination. A higher sense of control is likely to repel tendencies to procrastinate. Students with a lower sense of control, in contrast, are inclined to put off starting their academic work (Haghbin, McCaffrey, & Pychyl, 2012; Steel, 2007; Wolters, 2003).

Students gain a sense of control when teachers provide a highly structured environment by communicating clear expectations and directions, scheduling students' activities, framing learning activities with explicit guidance, taking the lead during some instructional activities, offering personal control enhancing feedback, and providing consistency in the lesson (Brophy, 2006; Doyle, 2006). Structure refers to the amount and clarity of information that teachers provide to students about how to effectively achieve desired educational outcomes (Skinner & Belmont, 1993). The provision of classroom structure helps to nurture students' perceived competence in terms of managing academic tasks (Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). Presumably, the enhanced sense of control over academic outcomes would foster students' adaptive perfectionism. To determine whether perceived classroom structure functioned as an environmental factor predicting both perfectionism and procrastination, the effects of students' perceptions of teachers' provisions of classroom structure on their perfectionistic tendencies as well as procrastination were explored in the current study.

Time management

Aside from students' perfectionistic tendencies and perceptions of classroom structure, self-regulation is another key to understanding procrastination. After reviewing a wide range of studies on procrastination, Steel (2007) concluded that procrastination is basically a failure of self-regulation. Procrastinators tend to lack goal orientation and a motivated, planful approach to learning (Klassen et al., 2008; Wolters, 2003). In Wolters's study, self-regulation accounted for more variance in procrastination beyond what is explained by anxiety, depression, and low self-esteem. Most of the research in this regard has focused on the effects of overall self-regulation. Wolters accordingly suggested that there is a need to examine whether specific aspects of self-regulated learning might better explain students' propensity to procrastinate. In response to this suggestion, students' time management was taken into consideration in the present study to detect its unique variance in procrastination beyond what is accounted for by perfectionism and perceived classroom structure.

Time management refers to achievement behaviors aiming at using time effectively while engaging in goal-directed activities (Claessens, van Eerde, Rutte, & Roe, 2007). The demands of the transition to secondary education in combination with the large amount of time that adolescents spend online and other entertaining activities indicate that time management may play a pivotal role in academic achievement in the early teens. Little is known, nevertheless, about how time management is related to academic procrastination in the precollege years. In terms of research on time management, adolescent populations have largely been ignored. Time management may be particularly important at the stage of adolescence for the possibility of early remediation (Liu, Rijmen, MacCann, & Roberts, 2009). For this reason, the predictors of time management as well as the relationships between adolescents' time management and academic procrastination were examined in the present research.

The present study

To sum up, the purpose of the present study was to examine the relationships between perfectionism, perceptions of classroom structure, time management, and academic procrastination to obtain a comprehensive understanding of the mechanisms determining Taiwanese adolescent students' perfectionistic tendencies, time management, and academic procrastination. Specifically, this study was devised to test the following hypotheses: (a) Students' perceptions of classroom structure, parental expectations, and parental criticism would significantly predict their adaptive and maladaptive perfectionism; (b) students' perceptions of classroom structure, parental expectations, parental criticism, and their perfectionistic tendencies would significantly predict their time management behaviors; and (c) students' perceptions of classroom structure, parental expectations, parental criticism, their perfectionistic tendencies, and time management behaviors would significantly predict their procrastination on homework and preparing for the examination.

To examine the first hypothesis, simultaneous regression analysis was employed. Because only three variables were hypothesized to predict adaptive and maladaptive perfectionism, this

method was selected for maximizing prediction (Cohen, 2001). Hierarchical regression analysis was used to test the second and third hypotheses for the reason that this analysis strategy can offer the opportunity to determine the relative importance of a particular set of predictors. The focus of hierarchical regression is on the change in predictability associated with predictor variables entered later in the analysis over and above that contributed by previously entered predictors. The change in R^2 statistics at each step of the analysis accounts for the increment in variance after each set of variables is entered into the regression model (Cohen, 2001). By calculating the change in R^2 , the relative contributions of each set of hypothesized factors to predicting time management and academic procrastination were evaluated.

Method

Participants

The participants included 405 eighth-grade Taiwanese students from 12 classes in four junior high schools. Students in Taiwan attend junior high school for three years (Grades 7–9) at the ages of 13–15 years old. 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 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. All participants needed to take the entrance examination at the end of ninth grade for admission into the senior high school. Preparation for the examination required them to stay in schools to practice tests nightly until as late as 8 or 9 p.m. Moreover, approximately 60% of them attended cram schools to supplement their regular education in order to be admitted into elite senior high schools. Forty percent of the participants stayed up late to complete homework. Students' participation was voluntary. Guidelines for the proper treatment of human subjects were followed (APA, 2010). All participants had parental consent to take part in the study. Confidential treatment of the data was guaranteed.

Procedure

The data were collected at the beginning of Grade 8. Students were invited to fill out a survey (described in detail below) during regular class time. It took participants about 20–25 min to complete the questionnaire. 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.

Measures

Participants were instructed to respond to all items using a 5-point Likert-type 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 each scale used in the present study is detailed subsequently. The correlations among the scales are shown in Table 1. Table 2 summarizes the number of scale items, example items, and Cronbach's alpha coefficients for the scales.

Perceived classroom structure

Students' perceived classroom structure was assessed by the scale adapted from the Measure of Teacher Provision of Structure (Belmont, Skinner, Wellborn, & Connel, 1992). This scale consists of five items that measure students' perceptions of classroom structure provided by their teachers. Higher scores indicate that students perceive higher levels of classroom structure. Example items include "My teacher shows me how to solve problems for myself" and "My teacher makes it clear what he/she expects of me in school." This scale demonstrated acceptable reliability with a Cronbach's alpha value of .82.

Parental expectations

Students' perceptions of parental expectations were assessed using a five-item self-report questionnaire. This scale was adapted from the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990). Higher scores reflect higher levels of parental expectations. Example items include "My parents set very high standards for me" and "My parents want me to do the best at everything." This scale demonstrated a good internal reliability coefficient of .85.

Parental criticism

Parental criticism scale is also one of the subscales of the MPS. Parental expectations and parental criticism are both considered to be the theorized root of perfectionism (Frost et al., 1990). This scale consists of four items. Higher scores indicate that students experience higher levels of parental criticism. Example items include "My parents never tried to understand my mistakes" and "As a child, I was punished for doing things less than perfect." Cronbach's alpha was found to be .70 in the present study.

Adaptive perfectionism

The adaptive perfectionism measure was created by combining the subscales of MPS (Frost et al., 1990) assessing personal standards and a tendency to be organized. This composite scale consists of nine items, with four items measuring personal standards and five items measuring organization. Higher scores represent a higher inclination toward adaptive perfectionism. Example items include "I set higher goals than most people" and "I try to be an organized person." Cronbach's alpha was .88.

Maladaptive perfectionism

The maladaptive perfectionism measure was generated by combining the subscales of MPS (Frost et al., 1990) assessing concern over mistakes and doubts about actions (i.e., the degree to which one is confident in his or her ability to complete tasks). This composite scale consists of seven items, with four items measuring concern over mistakes and three items measuring doubts about actions. Higher scores indicate higher levels of maladaptive perfectionism. Example items include "People will probably think less of me if I make a mistake" and "I usually have doubts about the simple everyday things I do." This scale had a Cronbach's alpha of .78.

Time management

Students' time management behaviors were assessed by the scale adapted from one of the subscales (i.e., the scale of planning) of the Time Management Questionnaire (Liu et al., 2009). This scale has seven items that measure students' behaviors of planning and using aids to manage time. High scores suggest better time management skills. Example items include "I always plan my study ahead of time" and "I mark assignment deadlines and exam dates on calendar." This scale yielded a good internal consistency of .91.

Procrastination on homework

Students' tendencies to academic procrastination were assessed by the adapted version of the Academic Procrastination Questionnaire (Huang, 2009). This questionnaire consists of two subscales, the scale of procrastination on homework and the scale of procrastination on examination preparation. The scale of procrastination on homework has 6 items that measure students' procrastination behaviors when doing homework. High scores indicate a higher tendency to procrastinate on completing homework. Example items include "I usually wait until the last

Table 1. Descriptive statistics and bivariate correlations among scales used in the present study ($N = 405$).

Scale	1	2	3	4	5	6	7	8
1. Perceived classroom structure	—							
2. Parental expectations	.10	—						
3. Parental criticism	-.06	.59*	—					
4. Adaptive perfectionism	.35**	.29**	-.02	—				
5. Maladaptive perfectionism	.02	.49**	.50**	.27**	—			
6. Time management	.27**	.14**	-.07	.58**	.11*	—		
7. Procrastination on homework	-.11*	.03	.26**	-.35**	.15**	-.41**	—	
8. Procrastination on exam preparation	-.15**	.01	.26**	-.34**	.20**	-.42**	.75	—
<i>M</i>	3.53	2.92	2.62	3.20	2.58	2.82	2.52	2.90
<i>SD</i>	0.88	1.00	0.95	0.82	0.78	0.90	1.01	0.90

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

Table 2. Number of items, example items, and alpha coefficients for scales used in the present study.

Scale	Number of items	Example items	α
Perceived classroom structure	5	My teacher shows me how to solve problems for myself. My teacher makes it clear what he/she expects of me in school.	.82
Parental expectations	5	My parents set very high standards for me. My parents want me to do the best at everything.	.85
Parental criticism	4	My parents never tried to understand my mistakes. As a child, I was punished for doing things less than perfect.	.70
Adaptive perfectionism			
	9	I set higher goals than most people. I try to be an organized person.	.88
Maladaptive perfectionism	7	People will probably think less of me if I make a mistake. I usually have doubts about the simple everyday things I do.	.78.
Time management	7	I always plan my study ahead of time. I mark assignment deadlines and exam dates on calendar.	.91
Procrastination on homework	6	I usually wait until the last minute to start my homework. I usually procrastinate on carrying out the plan of doing homework.	.90
Procrastination on exam preparation	6	While preparing for the examination, I usually procrastinate on carrying out my study plan. I usually postpone my study for examination because of other activities.	.86

minute to start my homework” and “I usually procrastinate on carrying out the plan of doing homework.” This scale demonstrated good reliability, with a Cronbach’s alpha of .90.

Procrastination on examination preparation

This is also a subscale of the Academic Procrastination Questionnaire. The scale consists of six items that measure students’ tendencies to procrastinate on preparation when the examination is approaching. Higher scores reflect a higher tendency to procrastinate on preparing for the examination. Example items include “While preparing for the examination, I usually procrastinate on carrying out my study plan” and “I usually postpone my study for examination because of other activities.” Cronbach’s alpha was .86.

Results

Regression analyses

Results from regression analyses are presented first for outcomes regarding students’ perfectionistic tendencies and then for their time management 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 simultaneous regression analyses predicting adaptive and maladaptive perfectionism, students’ perceptions of classroom structure, parental expectations, and parental criticism were entered as predictors. For the outcomes regarding time

management and academic procrastination, hierarchical regressions were conducted. Students’ perceptions of classroom structure, parental expectations, and parental criticism were entered in block 1. In block 2, perfectionistic tendencies (i.e., adaptive and maladaptive perfectionism) were entered in the regression models. Students’ perceptions of classroom structure, parental expectations, and parental criticism were given higher priority of entry because this set of environmental predictors was presumed to be causally prior to perfectionistic tendencies (Tabachnick & Fidell, 2007). In the hierarchical regressions predicting academic procrastination (i.e., procrastination on homework and procrastination on preparing for the examination), time management was entered in block 3 to test whether this very predictor explained incremental variance in academic procrastination beyond perfectionism. 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 arising from completing a series of analyses with related outcomes (Tabachnick & Fidell, 2007).

Regressions predicting students’ adaptive and maladaptive perfectionism

Adaptive perfectionism

Results of regression analyses predicting students’ adaptive and maladaptive perfectionism are displayed in Table 3. Students’ perceptions of classroom structure, parental expectations, and parental criticism were entered in the regression model and

Table 3. Summary of regression analyses predicting perfectionistic tendencies ($N = 405$).

Variable	Adaptive perfectionism			Maladaptive perfectionism		
	β	t	R^2	β	t	R^2
Perceived classroom structure	.29***	6.49		.02	.35	
Parental expectations	.40***	7.22		.28***	5.42	
Parental criticism	.24***	4.30		.34***	6.46	
			.22			.31

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

accounted for a significant amount of the variance (22%) in their adaptive perfectionistic tendencies, $F(3, 401) = 38.33$, $p < .001$. Perceived classroom structure and parental expectations positively predicted adaptive perfectionism ($\beta = .29$, $p < .001$ and $\beta = .40$, $p < .001$, respectively). In contrast, parental criticism emerged as a negative predictor of adaptive perfectionism ($\beta = -.24$, $p < .001$).

Maladaptive perfectionism

The amount of variance (31%) explained by students' perceptions of classroom structure, parental expectations, and parental criticism was significant for maladaptive perfectionism, $F(3, 401) = 59.41$, $p < .001$. It turned out that students' perceptions of classroom structure failed to significantly predict their maladaptive perfectionistic tendencies. With regard to parental influences, both parental expectations and parental criticism were found to be positively associated with maladaptive perfectionism ($\beta = .28$, $p < .001$ and $\beta = .34$, $p < .001$, respectively).

Hierarchical regressions predicting students' time management and academic procrastination

Time management behaviors

Table 4 presents results of hierarchical regressions predicting students' time management and academic procrastination. The amount of variance (11%) explained by students' perceptions of classroom structure, parental expectations, and parental criticism in the first step of the analysis was significant for students' time management behaviors, $F(3, 401) = 16.45$, $p < .001$. Perceived classroom structure and parental expectations positively predicted time management ($\beta = .24$, $p < .001$ and $\beta = .23$, $p < .001$, respectively). In contrast, parental criticism was negatively correlated with students' time management behaviors ($\beta = -.19$, $p < .01$). Adding perfectionistic tendencies in the second step increased the amount of variance explained for time management by 23%, $F(5, 399) = 41.53$, $p < .001$. When other variables were controlled for, adaptive perfectionism emerged as the only significant predictor of students' time management behaviors ($\beta = .55$, $p < .001$).

Procrastination on homework

Students' perceptions of classroom structure, parental expectations, and parental criticism were entered in the first regression model and accounted for a significant amount of the variance (10%) in procrastination on homework, $F(3, 401) = 14.44$, $p < .001$. Parental expectations negatively predicted students' procrastination on homework ($\beta = -.18$, $p < .01$), whereas parental criticism positively predicted this type of procrastination ($\beta = .36$, $p < .001$). Perceived classroom structure, however, failed to significantly predict procrastination on homework. In Step 2, students' perfectionistic tendencies were included in the model. Adding these variables increased the amount of the variance explained for procrastination on homework by 11%, $F(5, 399) = 21.10$, $p < .001$. Results from this step suggested that when other predictors were controlled for, adaptive perfectionism was negatively associated with procrastination on homework ($\beta = -.39$, $p < .001$). On the contrary, maladaptive perfectionism was positively correlated with this aspect of students' procrastination ($\beta = .18$, $p = .001$). Parental criticism remained to significantly predict procrastination on homework ($\beta = .21$, $p = .001$). In Step 3, students' time management was entered. Adding this variable increased the amount of variance explained for procrastination on homework by 6%, $F(6, 398) = 23.91$, $p < .001$. When other predictors were controlled for, students' time management behaviors negatively predicted their procrastination on homework ($\beta = -.29$, $p < .001$). Also, parental criticism as well as adaptive and maladaptive perfectionism remained to be significant predictors of this type of procrastination. Parental criticism and maladaptive perfectionism positively predicted procrastination on homework ($\beta = .20$, $p = .001$ and $\beta = .18$, $p = .001$, respectively). In contrast, adaptive perfectionism remained to be a negative predictor ($\beta = -.23$, $p < .001$).

Procrastination on preparing for the examination

Students' perceptions of classroom structure, parental expectations, and parental criticism were entered in Step 1 and accounted for a significant amount of the variance (11%) in their procrastination on preparing for the examination, $F(3,$

Table 4. Summary of hierarchical regression analyses predicting time management and academic procrastination ($N = 405$).

Variable	Time management			Procrastination on homework			Procrastination on exam preparation		
	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Step 1			.11			.10			.11
Perceived classroom structure	.24***	4.89		-.07	-1.41		-.10	7.19	
Parental expectations	.23***	3.88		-.18**	-2.93		-.21***	5.66	
Parental criticism	-.19**	-3.17		.36***	6.09		.38***	-1.49	
Step 2			.23			.11			.12
Perceived classroom structure	.07	1.70		.04	.88		.01	.09	
Parental expectations	.02	.30		-.07	-1.20		-.13*	-2.18	
Parental criticism	-.05	-.84		.21***	3.41		.20***	3.37	
Adaptive perfectionism	.55***	11.59		-.39***	-7.37		-.37***	-7.23	
Maladaptive perfectionism	-.03	-.56		.18***	3.31		.26***	4.72	
Step 3						.06			.06
Perceived classroom structure				.06	1.37		.03	.58	
Parental expectations				-.07	-1.16		-.13*	-2.18	
Parental criticism				.20***	3.30		.19***	3.26	
Adaptive perfectionism				-.23***	-3.85		-.21***	-3.62	
Maladaptive perfectionism				.18***	3.27		.25***	4.75	
Time management				-.29***	-5.50		-.30***	-5.73	

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

401) = 17.14, $p < .001$. Parental expectations were negatively associated with procrastination on preparing for the examination ($\beta = -.21, p = .001$), whereas parental criticism was positively related to this type of procrastination ($\beta = .38, p < .001$). Students' perceptions of classroom structure again failed to significantly predict their procrastination on preparing for the examination. Results from Step 2 showed that adding perfectionistic tendencies increased the amount of variance explained by 12% for procrastination on preparing for the examination, $F(5, 399) = 23.93, p < .001$. Students' adaptive perfectionistic tendencies negatively predicted their procrastination on preparing for the examination ($\beta = -.37, p < .001$), whereas maladaptive perfectionistic tendencies positively predicted this variable of interest ($\beta = .26, p < .001$). Additionally, parental criticism remained to be a significant predictor of procrastination on preparing for the examination ($\beta = .20, p = .001$). In the final step, students' time management was included. Adding this variable increased the amount of variance explained for procrastination on preparing for the examination by 6%, $F(6, 398) = 26.99, p < .001$. When other predictors were taken into consideration, students' time management behaviors negatively predicted their procrastination on preparing for the examination ($\beta = -.30, p < .001$). Parental criticism, adaptive perfectionism, and maladaptive perfectionism remained to significantly predict this type of procrastination. Parental criticism and maladaptive perfectionism positively predicted students' procrastination on preparing for the examination ($\beta = .19, p = .001$ and $\beta = .25, p < .001$, respectively). Conversely, adaptive perfectionism remained to be a negative predictor ($\beta = -.21, p < .001$).

Discussion

Findings of the present study advance the understanding of the antecedents of adolescents' academic procrastination and time management within the Taiwanese context. This line of research has primarily been confined to college student samples. There is a need to examine students' procrastination and time management in the precollege years. The present findings thus expand the knowledge in this respect. Additionally, the current research offers insights into the determining factors of adolescents' adaptive and maladaptive perfectionistic tendencies. Results of this study suggest that parental expectations and criticism emerge as significant predictors of both adaptive and maladaptive perfectionism. Also, students' perceptions of classroom structure positively predict their adaptive perfectionism. Further, results of hierarchical regressions reveal that parental influences along with adolescents' perfectionistic tendencies are the antecedents of time management and academic procrastination. Time management is also found to be a vital mechanism determining students' procrastination on homework and preparing for the examination. Subsequently, several important findings are discussed in more detail.

Predictors of perfectionism

Results of regression analyses indicate that students' perceptions of classroom structure positively predicted their adaptive perfectionism. When students perceive that teachers provide sufficient

and clear information as to the ways of effectively achieving desired academic outcomes, they are more inclined to set high personal standards and to be organized. Students' adaptive perfectionism may be brought forth by their heightened sense of control over academic outcomes as a result of highly structured classroom environment. Perceived classroom structure, nonetheless, is not significantly associated with maladaptive perfectionism. It appears that although teachers' provision of structure may nurture adaptive perfectionism, such an environmental factor fails to diminish maladaptive perfectionism.

With regard to parental influences on students' perfectionistic tendencies, parental expectations positively predict both adaptive and maladaptive perfectionism. Parental criticism, however, is differently associated with these two types of perfectionism. Students' experiences with parental criticism (e.g., being punished for doing things less than perfect or feeling like not being able to meet parents' standards) positively predict their tendencies to be overly concerned about making mistakes and to doubt the quality of their performance (i.e., maladaptive perfectionism). In contrast, the more students experience parental criticism, the less apt they are to set personal standards of performance and to be organized (i.e., adaptive perfectionism). These findings suggest that parental criticism may foster maladaptive perfectionism and, conversely, lower the levels of adaptive perfectionism. Unlike the contrasting effects of parental criticism on the two types of perfectionism, parental expectations seem to represent a hybrid of construct. Perceiving that parents expect excellence not only enables students to set high standards of performance for themselves, but also brings about students' concerns over mistakes and doubts about their ability to accomplish tasks.

Predictors of time management

Findings of the present research suggest that both the classroom and family environmental factors included in the hierarchical regression models emerge as significant predictors of students' behaviors of planning and using aid to manage time. As expected, adolescents' perceptions of classroom structure positively predict their time management. When teachers guide student learning by conveying clear direction, scheduling academic activities, and offering feedback enhancing personal control (Brophy, 2006; Doyle, 2006), students are motivated to manage time effectively to carry out the learning task. Likewise, in the family environment, parental expectations are thought to engender students' time management behaviors that may help to meet the high standards set by parents. Parental criticism, nevertheless, may be detrimental to students' engagement in time management. Students' fear of being punished for not meeting parent-set standards is likely to generate avoidance motivation that may undermine their desire to use time effectively in order to achieve academic excellence (Elliot, 1999).

In terms of the effects of perfectionistic tendencies, only adaptive perfectionism is found to significantly predict time management after controlling for the environmental predictors discussed previously. It is speculated that adaptive perfectionism may mediate the relationships between the classroom as well as family environment factors and students' time management behaviors. Put another way, in comparison with those

environmental influences, adaptive perfectionism may function as a more proximal predictor of time management. As stated previously, perceived classroom structure and parental expectations can inspire students to develop adaptive perfectionistic tendencies. In turn, those who hold high standards of performance and have a strong sense of orderliness (i.e., adaptive perfectionists) are more likely to employ planning and other techniques to manage time while pursuing their academic goals. It is noteworthy that the variance in time management explained by adaptive perfectionism alone (23%) is twice as much as the variance accounted for by all the environmental factors (11%), indicating the crucial role of this type of perfectionism in students' time management behaviors.

Predictors of academic procrastination

Results of hierarchical regressions suggest similar predictors of adolescent students' procrastinations on homework as well as examination preparation. Unlike the significant correlations between perceived classroom structure and time management, students' perceptions of classroom structure fail to significantly predict their academic procrastination. When it comes to adolescents' academic procrastination, parents appear to have much greater influence than teachers do. Parental expectations negatively predict adolescents' procrastinations on homework and preparing for the examination, whereas parental criticism emerges as a positive predictor of these two types of academic procrastination. When students perceive parents' critical attitudes toward their failure to meet the standard, such perceptions may result in fear of failure that eventually leads to procrastination. Parents' expectations of excellence without criticism about children's less than perfect performance may reduce their children's tendencies to put off starting homework and preparing for the examination. Parental expectations may encourage students to manage time effectively and therefore help to mitigate their academic procrastination. Parental criticism, by contrast, may be deleterious to students' time management and in turn, heighten their proclivity to procrastinate when engaging in schoolwork.

In addition to parental influences, individuals' perfectionistic tendencies also function as predictors of their procrastination on homework and preparing for the examination. Maladaptive perfectionism is found to positively predict students' procrastinating behaviors. Conversely, adaptive perfectionism is negatively associated with both types of academic procrastination. These findings support the need to differentiate the two types of perfectionism. Simply setting high standards and striving for excellence without worrying about failure (i.e., adaptive perfectionism) is likely to motivate students to approach success. This approach motivation may enable students to actively pursue challenging tasks. Such engagement behaviors, apparently, are beneficial for alleviating academic procrastination. By contrast, in consistence with previous findings (Burnam et al., 2014; Solomon & Rothblum, 1984), students' concerns about mistakes and evaluation anxiety (i.e., maladaptive perfectionism) are found to be positively related to academic procrastination. The critical evaluation tendencies elicited by maladaptive perfectionism may lead students to engage in academic procrastination in order not to appear

incompetent. Parental criticism remains to be a significantly positive predictor after perfectionistic tendencies are included in the regression model. In other words, both parental criticism and maladaptive perfectionism contribute unique variance to predicting students' procrastination on homework and preparing for the examination.

The addition of time management in the final regression model accounts for incremental variance (6%) in procrastination on both homework and examination preparation. Students' time management behaviors are negatively associated with academic procrastination. Adolescents who are able to use time effectively while engaging in academic tasks are less likely to procrastinate. The increased amount of variance explained by time management suggests that this particular self-regulatory strategy in effect exerts additional influences on both types of academic procrastination beyond perfectionism. On top of the broad personality tendencies, the individual's self-regulation may also constitute a significant determinant of academic procrastination.

Implications for education

Results of the present research suggest that to decrease adolescents' academic procrastination, it is helpful to cultivate their adaptive perfectionism and to reduce maladaptive perfectionism. To nurture students' adaptive perfectionistic strivings, teachers should encourage them to set higher standards and undertake challenging academic tasks. Additionally, adaptive perfectionism can be facilitated by making material relevant and interesting to students, providing support for complex tasks, and avoiding using grades and incentives to motivate students (Meece, 1991). As for decreasing maladaptive perfectionism, the primary socializing agents such as parents should avoid using manipulative techniques like guilt-induction and love withdrawal to pressure children into compliance with their standards. It has been found that the use of these manipulative techniques may orient children to engage in harsh self-scrutiny and negative self-evaluation (i.e., maladaptive perfectionism) when they fail to fully meet the standards (Blatt, 1995; Shahar, Blatt, Henrich, Ryan, & Little, 2003). In the classroom context, teachers can provide mastery-oriented motivational support through explicitly conveying to students that making mistakes is a natural part of learning. In an environment where students feel free to take risks, make mistakes, and try again on their way to success without worrying about putting their self-worth in jeopardy, their concerns about negative evaluation are supposed to be greatly eased (Turner, Meyer, Midgley, & Patrick, 2003).

Another implication can be drawn from the present findings is that the training of time management skills for adolescents may be particularly useful to diminish their academic procrastination. Results of the current study indicate that the provision of classroom structure is likely to promote students' time management behaviors. In addition to providing classroom structure, teachers can increase students' ability to plan their study by instructing them to set proximal goals for academic tasks. Setting specific proximal goals may elevate students' motivation to complete the work and thus alleviate their procrastination (Wolters, 2003).

Limitations and future research

Although results of the present study provide insights into educational practices, there are several limitations that need to be addressed in the future research. First, findings of this study are all based on self-report measures. Rather than using self-reports solely, future research should incorporate other methods of data collection (e.g., parental and teacher reports) to ensure whether students' perceptions are in line with the self-ratings of teachers and parents themselves. Second, a closer look at the results from hierarchical regressions suggest that adaptive perfectionism is likely to play a mediating role in the relationships between the classroom as well as family environment and students' time management. Whereas the regression analysis employed in the current research helps to detect the relative importance of each set of predictors, such a procedure does not allow the examination of the mediating relationships. Future research using structural equation modeling to test the path model is encouraged. Finally, the present research attempts to examine the likely antecedents of adolescents' academic procrastination and time management. However, this study is cross-sectional and correlational in nature such that the directions of the relationships among the variables cannot be determined for sure. A cross-lagged model that is able to address issues of causality is needed in future research. The very research design should allow for a more precise identification of the antecedents of adolescents' academic procrastination and time management. Such understanding has the potential for effective interventions that may foster adaptive academic engagement.

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