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Perfectionism, Implicit Theories of Intelligence, and Taiwanese Eighth-Grade Students' Academic Engagement

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ABSTRACT. The authors attempted to examine how Taiwanese junior high school students' perfectionistic tendencies and implicit theories of intelligence were related to their academic emotions and approach versus avoidance self-regulation, and to determine differences in contingent self-worth, emotions, and self-regulation among students with different subtypes of perfectionism. A total of 481 8th-grade Taiwanese students completed a self-reported survey assessing their perfectionistic tendencies, implicit theories of intelligence, academic emotions, behavioral self-regulation, and use of self-handicapping strategies. Results suggested that adaptive perfectionism enabled adolescents to experience positive emotions and to engage in behavioral self-regulation, whereas maladaptive perfectionism was positively associated with negative emotions and self-handicapping. In addition, the incremental theory of intelligence predicted positive affect and constructive coping. By contrast, the entity theory was positively correlated with negative emotions and self-handicapping. The authors also documented profiles of students with different perfectionistic tendencies. Findings showed that in general adaptive perfectionists displayed the healthiest emotions and self-regulatory styles. Implications for education and further research are discussed.

Keywords: academic emotions, contingent self-worth, implicit theories of intelligence, perfectionism, self-handicapping

Perfectionism has been generally conceptualized as a dispositional tendency to set excessively high standards for performance and to define an individual's 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 (Burns, 1980; Flett & Hewitt, 2002; Frost, Marten, Lahart, & Rosenblate, 1990; Pacht, 1984). An abundant literature has suggested the links between perfectionism and an array of psychological problems including performance anxiety, depression, a chronic sense of failure, procrastination, and shame (Frost et al., 1990; Mor, Day, Flett,

& Hewitt, 1995; Dunkley, Blankstein, Masheb, & Grilo, 2006; Hamachek, 1978; Pacht, 1984). Despite the well-documented deleterious effects of perfectionism, cumulative evidence indicates that the adaptive aspects of perfectionism need to be taken into account as well when investigating the very trait (Hamachek, 1978; Slade & Owens, 1998; Stoeber, Harris, & Moon, 2007; Stumpf & Parker, 2000; Suddarth & Slaney, 2001; Terry-Short, Owens, Slade, & Dewey, 1995).

Adaptive Versus Maladaptive Perfectionism

Adaptive perfectionism is by no means an innovative construct. Earlier theorists such as Hamachek (1978) argued that some aspects of perfectionism may foster excellence and striving to achieve important goals. According to Hamachek, in contrast with *neurotic perfectionists*, who experience elevated levels of guilt and shame when engaging in harsh evaluation of their behaviors, *normal perfectionists* enjoy their strivings and feel satisfied with their performance. Slade and Owens (1998) also distinguished conceptually between healthy perfectionism and unhealthy perfectionism. A healthy form of perfectionism leads to achievement of high standards without psychological distress, whereas an unhealthy form of perfectionism is regarded to be associated with such self-defeating behaviors as being overly concerned with how others evaluate the self, self-doubts, and worries over making mistakes.

On the basis of these theorists' arguments, two types of perfectionism should be differentiated. One type has been termed as normal, healthy, or adaptive perfectionism, characterized by positive achievement striving. The other type has been termed as neurotic, unhealthy, or maladaptive perfectionism, capturing maladaptive evaluative concerns.

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Whereas maladaptive perfectionism was found to be positively related to psychological dysfunction, adaptive perfectionism tended to be positively correlated with healthy adjustment (Stoeber et al., 2007). The examination of the positive aspects of perfectionism echoes the more recent focus of positive psychology on the conditions and processes that contribute to the flourishing or optimal functioning of people (Gable & Haidt, 2005). Hence, 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).

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 (MPS). These researchers 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. This dimension assesses individuals' tendencies to equate mistakes with failure and to believe that failure will lead to the loss of respect of others (Kawamura, Frost, & Harmatz, 2002). The third component is the tendency to doubt the quality of an individual's 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, Israeli, Smith, & Antony, 2003). The fifth and sixth dimensions assess the theorized root of perfectionism, high parental expectations, and parental criticism. Unlike the discussed dimensions measuring the intrapersonal aspects of perfectionism, these components concerning the perceptions of parents' attitude are considered interpersonal (Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005). Given that the present research focused on the intrapersonal aspects of adaptive versus maladaptive perfectionism, factors of parental influences were not addressed in this study.

Perfectionism and Self-Regulation

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, whereas 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 life, which is related to a prefer-

ence for challenging tasks and the desire to work hard (Blatt, D'Afflitti, & Quinlan, 1976; Stoeber & Rambow, 2007). Further, personal standards in combination with organization reflect such positive characteristics as planning and completion of tasks, indicators of behavioral self-regulation (Frost et al., 1990).

In contrast, maladaptive perfectionists' critical evaluation tendencies orient them to be overly concerned with mistakes, interpret mistakes as equivalent to failure, and worry about loss of status and worth. Such negative reactions to mistakes may lead to avoidance behaviors to fend off failure or to regain status and worth, for example, self-handicapping (Bieling et al., 2004; Brown et al., 1999; Pulford, Johnson, & Awaida, 2005). *Self-handicapping* refers to the use of strategies such as putting off studying until the last moment or fooling around the night before a test that serve as ready excuses for potential failure (Covington, 1992). Academic self-handicapping is a type of avoidance strategy some students use to deflect others' perceptions away from lack of ability should poor performance occur (Midgley & Urdan, 2001; Urdan & Midgley, 2001). Self-handicapping arises from a sense of self-doubt and a concern about others' evaluation of an individual's ability level, the very components comprising maladaptive perfectionism (Lynch, 1999). Accordingly, if maladaptive perfectionists feel uncertain of their odds of success, they would intentionally impede their own performance by employing this type of strategy to cope with fear of failure (Pulford et al., 2005).

Whereas there are plenty of studies on perfectionism in college students, little is known about perfectionism in junior high school students (Stoeber & Rambow, 2007). Of the handful studies investigating how perfectionism relates to adolescents' academic engagement (Accordino, Accordino, & Slaney, 2000; Einstein, Lovibond, & Gaston, 2000; Nounopoulos, Asbhy, & Gilman, 2006; Vandiver & Worrell, 2002), no one has yet addressed the relation of adaptive versus maladaptive perfectionism to patterns of self-regulatory strategy use among junior high students. Moreover, Mobley, Slaney, and Rice (2005) noted that the vast majority of research on perfectionism drew samples from the European American population. Such a sampling preference sharply constrained the generalization of research findings beyond this particular ethnic group. These researchers thus pointed out the need to examine the relevance of perfectionism for diverse ethnic, racial, and cultural groups. In response to their call, the present study attempted to explore the impacts of Taiwanese junior high students' perfectionistic tendencies on their academic emotions and self-regulation. It was hoped that the investigation would shed light on how perfectionism operates in a non-Western context.

Implicit Theories of Intelligence

In addition to perfectionistic tendencies, students' implicit theories of intelligence have been found to be important determinants of their affective experiences

and behaviors in achievement situations (Molden & Dweck, 2000). In the present study I therefore intended to explore to what extent implicit theories of intelligence predicted variance in adolescents' academic emotions and self-regulation over and above variance predicted by adaptive versus maladaptive perfectionism. As a cognitive framework that guides how individuals interpret and react to achievement situations, implicit theories refer to an individual's deeply held but rarely articulated thoughts about the nature of intelligence (Dweck, 2000; Dweck & Leggett, 1988; Hong, Chiu, & Dweck, 1995). Entity theorists believe that intelligence is a fixed entity that cannot be developed over time, whereas incremental theorists believe that intelligence is malleable and can be increased.

These different views about intelligence are thought to have a profound effect on the way in which people interpret their performance (Henderson & Dweck, 1991; Molden & Dweck, 2006). The belief that intelligence is fixed orients entity theorists to interpret negative performance outcomes as indicators of intellectual inadequacy. In contrast, because incremental theorists view intelligence as malleable, unsatisfactory performance may signify that their abilities would be improved through further attention and effort. Presumably, different emotions are likely to arise more readily within particular views of intelligence (Dweck & Molden, 2005). The greater propensity to make negative ability inferences following failure may raise entity theorists' vulnerability to negative affect, whereas incremental theorists' orientations toward developing their intelligence appear to enhance positive emotions such as interest and enjoyment.

Also, individuals with different views about intelligence tend to use contrasting self-regulatory strategies to deal with the challenges and struggles they face (Dweck & Molden, 2005; Molden & Dweck, 2006). When the ability is perceived as fixed, poor performance easily gives rise to serious concerns about the implied negative evaluation of the self. These concerns may lead entity theorists to adopt avoidance strategies (e.g., self-handicapping strategies) for concealing incompetence (Rhodewalt, 1994). On the contrary, when intelligence can be increased, performance setbacks are likely to inspire incremental theorists to engage in self-regulation characterized by active, direct, and constructive coping in order to bring about improvement (Dweck & Molden, 2005). Given the crucial role of implicit views about intelligence in students' responses to academic challenges, a full understanding of self-regulation should include an examination of how these beliefs are related to approach versus avoidant coping.

Contingent Self-Worth

Another purpose of the present study was to determine whether students' perceived levels of contingent self-worth would vary with different perfectionistic tendencies. As stated previously, one of the prominent characteristics of perfectionists is that they are apt to measure their self-worth

in terms of achieving self-imposed standards. Nevertheless, it remains unclear whether adaptive and maladaptive perfectionists would have the same level of contingent self-worth, such that both groups evaluate themselves based on the attainment of standards. Contingent self-worth refers to a domain of outcomes on which an individual has staked his or her self-esteem. How an individual defines his or her worth depends on adherence to self-standards in that domain (Crocker & Wolfe, 2001). It appears that the primary component of adaptive perfectionism, the setting of personal standards, does not necessarily lead to the judgment of an individual's self-worth depending on adherence to those standards. It is maladaptive perfectionism characterized by evaluative concerns that may be associated with higher levels of contingent self-worth. In other words, the levels of perfectionists' contingent self-worth were expected to be indicators differentiating adaptive from maladaptive perfectionists. If this would be the case, then what about those students holding both adaptive and maladaptive perfectionistic beliefs simultaneously? Would one subtype of perfectionism override the effects of the other subtype of perfectionism in terms of students' contingent self-worth? These interesting questions deserve more attention because they have not been answered in the literature yet.

In sum, the present research was devised to examine how Taiwanese junior high school students' perfectionistic tendencies and implicit theories of intelligence were related to their academic emotions and approach versus avoidance self-regulation as well as determine differences in contingent self-worth, emotions, and self-regulation among students with different subtypes of perfectionism. Specifically, I attempted to address the following research questions: (a) Do students' perfectionistic tendencies and implicit views about intelligence predict their positive and negative academic emotions? (b) Do students' perfectionistic tendencies and implicit views about intelligence predict their behavioral self-regulation and self-handicapping strategy use? (c) Do students' reported levels of contingent self-worth, academic emotions, and approach versus avoidance self-regulation differ according to their perfectionistic tendencies?

Method

Participants

The participants included 481 eighth-grade Taiwanese students from 15 classes in three junior high schools. Participating schools were located in the northern part of Taiwan. All of the school principals granted initial consent for data to be collected in their schools. The 247 girls (51%) and 234 boys ranged in age from 12 years, 6 months to 15 years, 1 month (M age = 13 years, 5 months; SD = 9.36 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.

Procedure

The data were collected at the beginning of the Grade 8 year (September). Students were required to fill out a few questionnaires (described subsequently in detail) 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 the items as accurately as possible. When the students filled out the questionnaires, the two assistants walked around to check skipped items and ensure quality responses.

Measures

Participants were instructed to respond to all items on 5-item Likert-type scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A Chinese version of this self-report survey was employed. To ensure adequate translation, the guidelines of the International Test Commission (Hambleton, 1994) were followed. All questionnaires were translated into Chinese and then back-translated into English.

Perfectionism. Students' perfectionistic tendencies were assessed by the scale adapted from the MPS (Frost et al., 1990). This scale measures perfectionism across six dimensions. For the present investigation, four of the original six subscales were used, including Personal Standards (e.g., "I set higher goals than most people"; 5 items, Cronbach's $\alpha = .80$), Organization (e.g., "I try to be an organized person"; 4 items, Cronbach's $\alpha = .85$), Concern over Mistakes (e.g., "People will probably think less of me if I make a mistake"; 5 items, Cronbach's $\alpha = .83$), and Doubts About Actions (e.g., "I usually have doubts about the simple everyday things I do"; 4 items, Cronbach's $\alpha = .64$). The remaining two subscales of the MPS (Parental Expectations and Parental Criticism) were not used. These two scales measure aspects of an individual's experience with his or her parents. Because the present study was intended to investigate perfectionistic expectations an individual has for him- or herself, scales measuring parental expectations and criticism were not considered central to the aspect of perfectionism under investigation.

Next, according to Frost, Heimberg, Holt, Mattia, and Neubauer's (1993) study on adaptive versus maladaptive perfectionism, the Personal Standards and Organization subscales were combined to create the adaptive perfectionism measure ($r = .69, p < .001$; Cronbach's $\alpha = .87$). Also, the scores for concern over mistakes and doubts about actions were averaged to form a maladaptive perfectionism composite ($r = .49, p < .001$; Cronbach's $\alpha = .81$). To ensure the validity of these two composite scales, a confirmatory factor analysis was completed using LISREL 8.52 (Jöreskog & Sörbom, 2002). Maximum likelihood was used as the estimation method (Hoyle & Panter, 1995). In the model tested, items from each composite scale (i.e., adaptive vs. maladaptive perfectionism) were hypothesized to load only onto their respective latent variables. Results suggested that

this model represented an adequate fit to the data, $\chi^2(123, N = 481) = 316.41, p < .01, \chi^2/N = .65$; root mean square error of approximation (RMSEA) = .06, goodness of fit index (GFI) = .93, normed fit index (NFI) = 0.95, non-normed fit index (NNFI) = 0.96, comparative fit index (CFI) = 0.97, incremental fit index (IFI) = 0.97, relative fit index (RFI) = 0.94. Although the value of RMSEA was greater than .05, a number of researchers have suggested that values in the range of .05–.08 indicate reasonable fit (Browne & Cudeck, 1993; McDonald & Ho, 2002). Further, the χ^2/N ratio was less than 5.0, showing a good fit. In addition, any model with a fit index above .90 was considered acceptable (Hu & Bentler, 1999). Table 1 shows the standardized coefficients for confirmatory factor analyses performed in the present research.

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 4-item subscales of the entity (e.g., "Your intelligence is something about you that you can't change very much"; Cronbach's $\alpha = .83$) and incremental theories (e.g., "You can always substantially change how intelligent you are"; Cronbach's $\alpha = .77$). A confirmatory factor analysis (CFA) was performed to ensure the validity of this scale. In the model tested, items from each subscale were hypothesized to load only onto their respective latent variables. Results indicated that this model represented an acceptable fit for the proposed structure of the scale, $\chi^2(16, N = 481) = 50.03, p < .01, \chi^2/N = .10$; RMSEA = .07, GFI = 0.97, NFI = 0.97, NNFI = 0.96, CFI = 0.98, IFI = 0.98, RFI = 0.95.

Academic emotions. The questionnaire assessing adolescents' academic emotions was developed based on the Rochester Assessment of Intellectual and Social Engagement (RAISE). It measures the extent to which students feel certain emotions in classroom settings (Miserandino, 1996). The Positive Emotions subscale (6 items; Cronbach's $\alpha = .84$) was devised to assess such emotional experiences as curiosity (e.g., "When I am doing my work in class, I feel interested") and enjoyment (e.g., "When I am in school, I feel happy"). The Negative Emotions subscale (5 items, Cronbach's $\alpha = .72$) measures emotions including anxiety (e.g., "When my teacher first explains new material, I feel scared") and boredom (e.g., "When I am doing my work in class, I feel sleepy"). To test the validity of the scale, items from each subscale were hypothesized to load only onto their respective latent variables in the CFA model. Results showed that this model provided an acceptable fit to the data, $\chi^2(37, N = 481) = 114.07, p < .05, \chi^2/N = .23$; RMSEA = .07, GFI = 0.96, NFI = 0.96, NNFI = 0.96, CFI = 0.97, IFI = 0.97, RFI = 0.94.

Behavioral self-regulation. Students' behavioral self-regulation was measured by the Behavioral Self-Regulation Scale (Lin, 2006). The scale was developed to assess

TABLE 1. Standardized Coefficients for Confirmatory Factor Analyses (N = 481)

Observed variable	Latent construct	β	t	SE	SMC
Personal standards 1	Adaptive perfectionism	0.67*	14.84	0.05	0.45
Personal standards 2	Adaptive perfectionism	0.65*	14.15	0.05	0.42
Personal standards 3	Adaptive perfectionism	0.48*	9.84	0.05	0.23
Personal standards 4	Adaptive perfectionism	0.68*	15.07	0.05	0.46
Personal standards 5	Adaptive perfectionism	0.66*	14.36	0.05	0.44
Organization 1	Adaptive perfectionism	0.59*	12.29	0.05	0.35
Organization 2	Adaptive perfectionism	0.72*	16.06	0.05	0.52
Organization 3	Adaptive perfectionism	0.68*	14.88	0.05	0.46
Organization 4	Adaptive perfectionism	0.67*	14.68	0.05	0.45
Concern over mistakes 1	Maladaptive perfectionism	0.66*	13.90	0.05	0.44
Concern over mistakes 2	Maladaptive perfectionism	0.65*	13.71	0.05	0.42
Concern over mistakes 3	Maladaptive perfectionism	0.61*	12.90	0.05	0.37
Concern over mistakes 4	Maladaptive perfectionism	0.68*	14.39	0.05	0.46
Concern over mistakes 5	Maladaptive perfectionism	0.57*	11.58	0.05	0.32
Doubts about actions 1	Maladaptive perfectionism	0.57*	11.65	0.05	0.32
Doubts about actions 2	Maladaptive perfectionism	0.41*	8.11	0.05	0.17
Doubts about actions 3	Maladaptive perfectionism	0.44*	8.66	0.05	0.19
Doubts about actions 4	Maladaptive perfectionism	0.44*	8.59	0.05	0.19
Fixed intelligence 1	Entity theory	0.80*	19.68	0.04	0.64
Fixed intelligence 2	Entity theory	0.91*	23.24	0.04	0.83
Fixed intelligence 3	Entity theory	0.68*	15.92	0.04	0.46
Fixed intelligence 4	Entity theory	0.64*	13.62	0.05	0.41
Malleable intelligence 1	Incremental theory	0.86*	13.92	0.06	0.74
Malleable intelligence 2	Incremental theory	0.68*	14.32	0.05	0.46
Malleable intelligence 3	Incremental theory	0.84*	17.57	0.05	0.71
Malleable intelligence 4	Incremental theory	0.58*	12.83	0.05	0.34
Curiosity 1	Positive emotions	0.74*	17.41	0.04	0.55
Curiosity 2	Positive emotions	0.49*	10.36	0.05	0.24
Curiosity 3	Positive emotions	0.52*	11.57	0.05	0.27
Enjoyment 1	Positive emotions	0.83*	21.07	0.04	0.69
Enjoyment 2	Positive emotions	0.74*	17.91	0.04	0.55
Enjoyment 3	Positive emotions	0.81*	19.79	0.04	0.66
Anxiety 1	Negative emotions	0.33*	6.45	0.05	0.11
Anxiety 2	Negative emotions	0.26*	4.54	0.06	0.07
Anxiety 3	Negative emotions	0.56*	14.57	0.05	0.50
Boredom 1	Negative emotions	0.70*	11.35	0.05	0.31
Boredom 2	Negative emotions	0.70*	14.69	0.05	0.49
Effort investment 1	Behavioral self-regulation	0.73*	17.34	0.04	0.53
Effort investment 2	Behavioral self-regulation	0.78*	19.17	0.04	0.61
Effort investment 3	Behavioral self-regulation	0.78*	19.11	0.04	0.61
Persistence 1	Behavioral self-regulation	0.83*	21.20	0.04	0.69
Persistence 2	Behavioral self-regulation	0.76*	18.37	0.04	0.58
Persistence 3	Behavioral self-regulation	0.72*	16.87	0.04	0.52
Self-handicapping 1	Self-handicapping	0.48*	9.86	0.05	0.23
Self-handicapping 2	Self-handicapping	0.64*	13.79	0.05	0.41
Self-handicapping 3	Self-handicapping	0.74*	16.43	0.05	0.55
Self-handicapping 4	Self-handicapping	0.66*	14.14	0.05	0.44
Self-handicapping 5	Self-handicapping	0.64*	13.75	0.05	0.41
Approval from others 1	Contingent self-worth	0.71*	14.25	0.05	0.50
Approval from others 2	Contingent self-worth	0.57*	11.65	0.05	0.32
Approval from others 3	Contingent self-worth	0.75*	15.02	0.05	0.56
Approval from others 4	Contingent self-worth	0.39*	7.58	0.05	0.15

* $p < .05$.

students' tendencies to invest effort and persist (i.e., approach-oriented behaviors) when experiencing academic difficulties (e.g., "When I encounter difficulties completing academic assignments and want to give up, I always tell

myself to keep persisting"; 6 items, Cronbach's $\alpha = .90$). A CFA was also run to examine the validity of this scale. In the model tested, all the six items were hypothesized to load onto one latent construct. Results showed that this model

TABLE 2. Descriptive Statistics and Correlations for Study Variables (N = 481)

Variable	1	2	3	4	5	6	7	8	9
1. Adaptive perfectionism	—								
2. Maladaptive perfectionism	0.42**	—							
3. Incremental theory	0.52**	0.10*	—						
4. Entity theory	-0.21**	0.24**	-0.42**	—					
5. Positive emotions	0.46**	0.07	0.39**	-0.31**	—				
6. Negative emotions	-0.08	0.37**	-0.19**	0.40**	-0.42**	—			
7. Behavioral self-regulation	0.64**	0.18**	0.50**	-0.29**	0.56**	-0.20**	—		
8. Self-handicapping	-0.24**	0.22**	-0.26**	0.37**	-0.27**	0.35**	-0.34**	—	
9. Contingent self-worth	0.07	0.31**	-0.11*	0.16**	-0.10*	0.26**	-0.04	0.03	—
M	3.26	2.50	3.20	1.98	3.22	2.12	3.09	1.95	3.21
SD	0.70	0.68	0.87	0.89	0.80	0.73	0.86	0.72	0.86

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

provided a good fit to the data, $\chi^2(7, N = 481) = 13.56$, $p > .05$, $\chi^2/N = .03$; RMSEA = .04, GFI = 0.99, NFI = 0.99, NNFI = 0.99, CFI = 1.00, IFI = 1.00, RFI = 0.99.

Self-handicapping. Students' use of self-handicapping strategies was assessed using a five-item scale taken from the Patterns of Adaptive Learning Survey (PALS; Midgley et al., 2000). These items were constructed to measure the extent to which students employ a priori strategies to influence self-presentation. Rather than assessing cognitions, this scale measures students' use of active strategies and behaviors (e.g., "Some students put off doing their math work until the last minute. Then if they don't do well, they can say that is the reason. How true is this of you?"; Cronbach's $\alpha = .77$). In the CFA model, all the five items were hypothesized to load onto a single latent factor. Results showed that this model provided an excellent fit to the data, $\chi^2(5, N = 481) = 6.34$, $p > .05$, $\chi^2/N = .01$; RMSEA = .02, GFI = 0.99, NFI = 0.99, NNFI = 1.00, CFI = 1.00, IFI = 1.00, RFI = 0.98.

Contingent self-worth. The Contingencies of Self-Worth Scale developed by Crocker, Luhtanen, Cooper, and Bouvrette (2003) was employed to assess students' perceived levels of contingent self-worth. This measure assesses individuals' perceived sense that their own judgments of self-worth are influenced by the outcomes they receive in each domain. For the purpose of the present research, the subscale measuring the extent to which students base their self-esteem on receiving approval and acceptance from others was administered (e.g., "My self-esteem depends on the opinions others hold of me"; 4 items, Cronbach's $\alpha = .69$). In the model tested in the confirmatory factor analysis, the four items were hypothesized to load onto one latent factor. The CFA yielded an excellent fit to the data, $\chi^2(2, N = 481) = 0.85$, $p > .05$, $\chi^2/N = .001$; RMSEA = .01, GFI = 1.00, NFI = 1.00, NNFI = 1.01, CFI = 1.00, IFI = 1.00, RFI = 0.99.

Results

Regression Analyses

Table 2 provides descriptive information and correlations for study variables. Regression analyses were performed using SPSS 15.0. Results from the regression analyses are presented first for outcomes regarding students' academic emotions, then for their behavioral self-regulation, and finally for self-handicapping. In these analyses, gender was entered first in the hierarchical regression models. It turned out that gender failed to predict any outcome variable of interest. Students' perfectionistic tendencies as well as implicit theories of intelligence were subsequently entered across the analyses. The alpha level used to determine the significance of all of the regression 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 (Wolters, 2004). Results of the hierarchical regression analyses are displayed in Table 3.

Hierarchical Regressions Predicting Academic Emotions

Positive academic emotions. In the first step of the analysis, gender was entered and failed to significantly predict Taiwanese adolescents' positive academic emotions. Results from Step 2 indicated that adding adaptive and maladaptive perfectionism increased the amount of variance explained by 24% for positive academic emotions, $F(3, 475) = 48.68$, $p < .001$. Both adaptive ($\beta = .53$, $p < .001$) and maladaptive perfectionism ($\beta = -.16$, $p < .001$) emerged as significant predictors of positive academic emotions. In Step 3, students' implicit theories of intelligence were entered. Adding these variables increased the amount of variance explained for positive academic emotions by 4%, $F(5, 473) = 36.13$, $p < .001$. When other predictors were accounted for, students espousing an incremental theory tended to report higher levels of positive academic emotions ($\beta = .13$,

TABLE 3. Summary of Hierarchical Regression Analyses Predicting Academic Emotions and Self-Regulation (N = 481)

Variable	Positive emotions			Negative emotions			Behavioral regulation			Self-handicapping		
	β	<i>t</i>	ΔR^2	β	<i>t</i>	ΔR^2	β	<i>t</i>	ΔR^2	β	<i>t</i>	ΔR^2
Step 1			.00			.00			.00			.00
Gender	.03	0.44		.05	1.11		.02	0.36		-.06	-1.26	
Step 2			.24			.21			.41			.20
Gender	.01	0.20		.03	0.83		.01	0.11		-.07	-1.57	
Adaptive perfectionism	.53***	11.95		-.30***	-6.58		.68***	17.64		-.41***	-9.07	
Maladaptive perfectionism	-.16***	-3.52		.50***	11.05		-.12**	-3.00		.41***	8.93	
Step 3			.04			.06			.05			.05
Gender	.01	0.22		.05	1.18		.01	0.13		-.06	-1.42	
Adaptive perfectionism	.40***	7.70		-.18***	-3.51		.54***	12.10		-.30***	-5.62	
Maladaptive perfectionism	-.08	-1.70		.39***	8.32		-.06	-1.37		-.31***	-6.58	
Incremental theory	.13**	2.70		-.03	-0.51		.20***	4.56		-.06	-1.25	
Entity theory	-.15***	-3.22		.26***	5.67		-.08	-2.09		.21***	4.44	

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

$p < .01$). By contrast, an entity theory was negatively associated with positive emotions ($\beta = -.15, p < .001$).

Negative academic emotions. The amount of variance explained by the predictor variable in the first step of the analysis (i.e., gender) was insignificant for negative academic emotions. Adding the two aspects of perfectionism in Step 2 increased the amount of variance explained for negative academic emotions by 21%, $F(3, 475) = 42.66, p < .001$. Adaptive perfectionism was a negative predictor of negative academic emotions ($\beta = -.30, p < .001$), whereas maladaptive perfectionism positively predicted negative emotions ($\beta = .50, p < .001$). In Step 3, both incremental and entity theories of intelligence were included in the model. Adding these variables increased the amount of variance explained by 6% for negative academic emotions, $F(5, 473) = 35.35, p < .001$. Results from this step showed that in addition to adaptive and maladaptive perfectionism, an entity theory of intelligence significantly predicted negative emotions ($\beta = .26, p < .001$).

Hierarchical Regressions Predicting Behavioral Self-Regulation

As the first predictor variable, gender failed to explain a significant amount of the variance in behavioral self-regulation. In Step 2, the two subtypes of perfectionism were entered in the equation. Adding these variables increased the amount of variance explained in behavioral self-regulation by 41%, $F(3, 475) = 112.08, p < .001$. Both adaptive ($\beta = .68, p < .001$) and maladaptive perfectionism ($\beta = -.12, p < .01$) emerged as significant predictors, but in opposite directions. In the final step of the model, students' implicit theories of intelligence were included. Adding these variables increased the amount of variance explained by 5% for behavioral self-regulation, $F(5, 473) = 79.34, p < .001$. When other predictors were controlled for, students holding

an incremental theory were more likely to invest effort and persist when engaging in academic tasks ($\beta = .20, p < .001$).

Hierarchical Regressions Predicting Self-Handicapping

In terms of self-handicapping, gender was entered in Step 1 and failed to predict a significant portion of the variance. Results from Step 2 suggested that adding adaptive and maladaptive perfectionism increased the amount of variance explained in self-handicapping by 20%, $F(3, 475) = 38.63, p < .001$. Adaptive perfectionism was a negative predictor of self-handicapping ($\beta = -.41, p < .001$), whereas maladaptive perfectionism positively predicted this type of avoidance strategy ($\beta = .41, p < .001$). In Step 3, both incremental and entity theories of intelligence were entered. Adding these variables increased the amount of variance explained for self-handicapping by 5%, $F(5, 473) = 30.21, p < .001$. In addition to the two aspects of perfectionism, an entity theory significantly predicted students' tendencies to self-handicap ($\beta = .21, p < .001$).

Mean Differences Among Students with Different Subtypes of Perfectionism

To determine the differences in the primary variables of interest among students with different subtypes of perfectionism, participating adolescents were identified as adaptive perfectionists, maladaptive perfectionists, and combined perfectionists (i.e., those who endorsed both adaptive and maladaptive perfectionism simultaneously). Based on the method that Butler (1998) employed to examine students who were primarily oriented toward one type of concern (a student was selected as expressing a particular type of concern only if he or she was above the mean on one concern and below the mean on the other concern), scores on the

TABLE 4. Mean Differences Among Students with Different Subtypes of Perfectionism

Variable	Adaptive (<i>n</i> = 101)		Maladaptive (<i>n</i> = 77)		Combined (<i>n</i> = 131)		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Contingent self-worth	3.07 _a	0.86	3.43 _b	0.70	3.43 _b	0.92	6.01**
Positive emotions	3.61 _a	0.85	3.16 _b	0.62	3.36 _b	0.79	7.18***
Negative emotions	1.84 _a	0.63	2.40 _b	0.78	2.31 _b	0.72	17.75***
Behavioral self-regulation	3.45 _a	0.78	2.92 _b	0.69	3.53 _a	0.82	16.29***
Self-handicapping	1.64 _a	0.62	2.28 _c	0.64	1.99 _b	0.80	17.89***

Note. Different subscripts denote significant differences ($p < .05$) in means according to Tukey's criteria.

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

adaptive and maladaptive perfectionism scales (Frost et al., 1990) served to identify adolescents who endorsed certain subtype of perfectionism. Using this criterion, students who scored above the mean on both adaptive and maladaptive perfectionism were identified as combined perfectionists. In total, 309 out of 481 students met this rigorous definition, including 101 adaptive perfectionists, 77 maladaptive perfectionists, and 131 combined perfectionists. Table 4 presents the means and standard deviations of the dependent variables according to students' different perfectionistic tendencies.

As Table 2 displays, in the present study, students' contingent self-worth, academic emotions, behavioral self-regulation, and use of self-handicapping strategies were correlated with one another and thus were used as dependent variables in the multivariate analysis of variance to explore whether adolescents with different subtypes of perfectionism differed in these outcome measures. The assumption for the MANOVA had been examined before the analysis was performed. Because cell sizes for the independent variables were unequal, Box's *M* test was conducted first to check for the homogeneity of covariance matrices. The results of this test was not significant ($F = 1.91, p > .05$), indicating the confirmation of this assumption (Tabachnick & Fidell, 1996). A multivariate analysis of variance (MANOVA) yielded significant effects for perfectionistic tendencies, Wilks's $\lambda =$

.76, $F(10, 604) = 8.85, p < .001$. Results of the univariate analyses of the main effects of students' tendencies toward perfectionism are detailed subsequently.

Contingent self-worth. Results of the univariate test showed significant effects on contingent self-worth, $F(2, 306) = 6.01, p < .01$. Tukey's post hoc analysis indicated that adaptive perfectionists reported significantly lower levels of contingent self-worth ($M = 3.07, SD = .86$) than did combined and maladaptive perfectionists ($M = 3.43$ for both groups, $SD = .92$ for combined perfectionists, $SD = .70$ for maladaptive perfectionists). In other words, adaptive perfectionists were significantly less likely to determine their self-worth based on others' approval than both combined and maladaptive perfectionists. Table 5 displays calculated effect sizes (Cohen's *d*) to reveal the magnitudes of mean differences among groups.

Academic emotions. The univariate test revealed significant effects on positive academic emotions, $F(2, 306) = 7.18, p = .00$. Tukey's post hoc analysis showed that adaptive perfectionists ($M = 3.61, SD = .85$) scored significantly higher on positive academic emotions than did both combined ($M = 3.36, SD = .79$) and maladaptive perfectionists ($M = 3.16, SD = .62$). In terms of negative academic emotions, results of the univariate analysis also showed

TABLE 5. Effect Size Statistics (Cohen's *d*) for the Differences Among Students with Different Subtypes of Perfectionism

Variable	Adaptive vs. Maladaptive	Adaptive vs. Combined	Maladaptive vs. Combined
	Cohen's <i>d</i>	Cohen's <i>d</i>	Cohen's <i>d</i>
Contingent self-worth	0.46	.40	.00
Positive emotions	0.62	.31	.29
Negative emotions	0.80	.70	.12
Behavioral self-regulation	0.73	.10	.81
Self-handicapping	1.02	.50	.40

significant effects, $F(2, 306) = 17.75, p < .001$. Post hoc analysis suggested that adaptive perfectionists ($M = 1.84, SD = .63$) reported significantly lower levels of negative emotions than did combined ($M = 2.31, SD = .72$) as well as maladaptive perfectionists ($M = 2.40, SD = .78$).

Approach and avoidance regulation. The univariate test indicated significant effects on students' behavioral self-regulation, $F(2, 306) = 16.29, p < .001$. Post hoc analysis showed that maladaptive perfectionists ($M = 2.92, SD = .64$) scored significantly lower on behavioral self-regulation than did combined ($M = 3.53, SD = .82$) and adaptive perfectionists ($M = 3.45, SD = .72$). Regarding self-handicapping, the univariate analysis yielded significant results as well, $F(2, 306) = 17.89, p < .001$. Post hoc analysis suggested that maladaptive perfectionists ($M = 2.28, SD = .64$) scored significantly higher on self-handicapping than did combined perfectionists ($M = 1.99, SD = .80$). Moreover, combined perfectionists were significantly more likely to use self-handicapping strategies than were adaptive perfectionists ($M = 1.64, SD = .62$).

Discussion

The present findings indicate that both perfectionistic tendencies and implicit theories of intelligence have unique and differential effects on Taiwanese junior high students' academic emotions and patterns of self-regulation. Adaptive perfectionism enables adolescents to experience positive emotions and to engage in behavioral self-regulation, whereas maladaptive perfectionism is positively associated with negative emotions and self-handicapping. In a similar vein, the incremental theory of intelligence fosters students' positive affect and constructive coping when facing academic difficulties. In contrast, the entity view is positively correlated with negative affect and avoidance strategy use. Results from the present study contribute to the understanding of the mechanisms that enhance the flourishing of individuals advocated by the positive psychology movement. Subsequently, several important findings are discussed.

Effects of Adaptive Versus Maladaptive Perfectionism

In the present study I primarily attempted to demonstrate the duality of perfectionism by examining the differential impact of adaptive versus maladaptive perfectionism on Taiwanese adolescents' academic emotions and self-regulation. The empirical findings from the present research substantiate the differentiation. Results from the hierarchical regression analyses suggest contrasting effects of the two forms of perfectionism on the outcome variables of interest. Adaptive perfectionism positively predicted students' positive academic emotions and behavioral self-regulation. Moreover, this form of perfectionism was negatively correlated with negative emotions and self-handicapping. Conversely, adolescents' maladaptive

perfectionistic tendencies were positively associated with negative emotions and self-handicapping and yet negatively related to positive affect and approach-oriented strategies.

Findings of the present study validate the argument that not all aspects of perfectionism are unhealthy. Once the influences of negative reactions to imperfection are controlled for, striving for perfection can be a healthy pursuit of excellence (Shafran, Cooper, & Fairburn, 2002). Specifically, perfectionistic strivings in effect have some positive impact on adolescents' emotional well-being along with effort expenditure and task persistence. Further, adaptive perfectionism is linked to fewer self-defeating behaviors and less vulnerability to negative affectivity. According to Slade and Owens's (1998) dual process model of perfectionism, adaptive perfectionism is associated with hope of success. Such a positive outlook, in turn, is supposed to give rise to positive emotions. In addition, motivation to approach success related to adaptive perfectionism may strengthen students' willingness to invest effort and persist (i.e., behavioral self-regulation) when engaging in academic tasks. Accordingly, adaptive perfectionists are less likely to self-handicap.

As opposed to the positive effects of adaptive perfectionism, maladaptive perfectionism exerts negative impact on students' emotional as well as self-regulatory functioning. Dunkley and Blankstein (2000) found self-criticism to be the primary indicator of maladaptive perfectionism latent factor. Put differently, maladaptive perfectionists' dissatisfaction with performance underlies their concern with mistakes and doubts about actions. Needless to say, dissatisfaction with an individual's own performance easily brings forth negative affect. Also, the fear of failure arising from self-criticism is likely to lead maladaptive perfectionists to engage in self-handicapping for the protection of self-worth (Pulford et al., 2005). The differential effects of adaptive versus maladaptive perfectionism shown in the present study confirm the need to include both forms when investigating the very construct. A focus only on the dysfunctional facets may result in losing sight of the big picture.

Concerning the predictability of adaptive and maladaptive perfectionism, this set of predicting variables account for around and above 20% of the variance in both positive and negative academic emotions. Dunkley, Zuroff, and Blankstein (2006) found that perfectionism constructs explained 14% of the variance in Canadian college students' positive affect and 24% of the variance in negative affect. For positive affect, the predictive value of perfectionism found in the present research is 10% greater than the value reported in Dunkley et al.'s study. These researchers also found that perfectionism constructs explained 19% of the variance in avoidant coping (e.g., behavioral and mental disengagement). Findings of the present study show similar magnitude of effects of adaptive versus maladaptive perfectionism on such an avoidance strategy as self-handicapping. The most striking finding involves the relatively large amount of variance (41%) explained in Taiwanese adolescents' behavioral self-regulation. The two forms of perfectionism evidently

played a formidable role in these youngsters' effort investment and academic perseverance.

Effects of Implicit Theories of Intelligence

Students' implicit theories of intelligence do indeed account for unique variance in their academic emotions and self-regulation beyond that predicted by perfectionism constructs. Nevertheless, the proportions of the explained variance are rather small (4~6%), suggesting a relatively minor role of this set of constructs as predictors. Results from the hierarchical regressions indicated that after controlling for adaptive versus maladaptive perfectionism, the incremental theory positively predicted positive emotions and behavioral self-regulation, whereas the entity theory positively predicted negative emotions and self-handicapping. Put another way, in addition to the positive influences of striving for perfection, the belief that intelligence can be developed over time also enabled students to persistently work hard (i.e., behavioral self-regulation) for surmounting difficulties. Moreover, the optimism for intelligence improvement is likely to inspire incremental theorists' curiosity as well as enjoyment while engaging in schoolwork (Dweck & Molden, 2005). In contrast, the belief that intelligence is fixed may lead to entity theorists' constant anxiety about negative ability inference following poor performance. Concerns with failure are likely to propel these students to engage in self-handicapping as an excuse for lack of ability (Lynch, 1999; Midgley & Urdan, 2001).

Profiles of Students with Different Perfectionistic Tendencies

A unique strength of the study design is that it documents similarities and differences in contingent self-worth, emotions, and self-regulation among students with different subtypes of perfectionism. Results of a MANOVA corroborated findings emerging from the hierarchical regression analyses. In general, adaptive perfectionists displayed the healthiest emotions and self-regulatory styles. Combined perfectionists tended to show similar patterns of emotions to those of maladaptive perfectionists. In addition, combined and maladaptive perfectionists shared the same level of contingent self-worth. Both groups of students reported significantly higher levels of contingent self-worth than did adaptive perfectionists. That is, combined and maladaptive perfectionists' tendencies to determine their self-worth based on the attainment of standards (others' approval in this case) were significantly greater than those of adaptive perfectionists. Students who scored above the mean on the Adaptive Perfectionism Scale and below the mean on the Maladaptive Perfectionism Scale were identified as adaptive perfectionists. Hence, simply striving for excellence yet without evaluative concerns did not orient adaptive perfectionists to measure their self-worth in terms of receiving others' approval. Further, it appears that maladaptive perfectionism was the key factor closely related to an individual's

contingent self-worth. Therefore, combined perfectionists' above-average adaptive perfectionistic tendencies showed little effect on their raised levels of approval seeking, an indicator of contingent self-worth in this study.

Across the variables regarding academic emotions and self-regulation, adaptive perfectionists display more positive functioning and yet less negative affect and destructive coping. Put another way, the setting of personal standards of performance combined with a tendency to be organized, although without concern over making mistakes and doubts about the quality of performance may not only heighten adolescents' positive emotions and constructive regulation when engaging in academic tasks, but also allay their maladaptive emotions and tendencies to self-handicap. These findings demonstrate that adaptive perfectionism *per se* can be a contributing factor to the optimal functioning of Taiwanese junior high students.

On the contrary, among the three types of perfectionists, maladaptive perfectionists show the most dysfunctional patterns of academic emotions and self-regulation. They report higher levels of negative emotions as well as self-handicapping, and yet lower levels of positive emotions and behavioral self-regulation. Lower levels of behavioral self-regulation suggest that maladaptive perfectionists are unwilling to expend effort and inclined to give up easily. When adolescents only focus on self-criticism although without a positive outlook for their performance, the dismal situation arises.

As to the profile of combined perfectionists, it is noteworthy that there are no significant differences in academic emotions between combined and maladaptive perfectionists. Both groups report lower levels of positive emotions and yet higher levels of negative emotions than do adaptive perfectionists. Although combined perfectionists are as willing to put effort and persist when encountering difficulties as adaptive perfectionists, their emotional well-being seems to be undermined by the coexisting maladaptive perfectionistic tendencies. All in all, the various profiles depicted in the present study suggest that Taiwanese adolescents' academic emotions and self-regulatory styles appear to vary as a function of their perfectionistic tendencies.

Implications for Classroom Practice

The profiles of students with different perfectionistic tendencies documented in the present research have profound implications for the classroom. Given that adaptive perfectionists are found to demonstrate healthy academic emotions and self-regulation, adolescents may benefit from the cultivation of adaptive perfectionistic traits without being accompanied by overly critical evaluations of their own performance. Namely, adaptive perfectionists are those who set high standards for themselves yet allow minor flaws in their performance as the situation permits (Hamachek, 1978). To meet this definition, on the one hand, teachers should nurture students' aspirations by encouraging them to set higher

standards and engage in challenging academic tasks. These practices are supposed to provide students with a positive outlook on life that may contribute to adaptive emotions and willingness to persist at pursuing their goals. On the other hand, teachers are advised to alleviate students' concern about making mistakes through the provision of mastery-oriented motivational support in the classroom. Specifically, teachers can explicitly convey to students that making mistakes is a natural part of learning (Turner, Meyer, Midgley, & Patrick, 2003). By creating an environment in which 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, teachers may facilitate students' adaptive achievement-relevant behaviors while at the same time reducing the potential negative outcomes stemming from evaluative concerns.

Limitations and Future Research

Although the results of the present study provide insights into teacher practices, there are several limitations that need to be addressed in future research. First, findings of the study are all based upon self-report measures. Although the assessment instruments used in the study have proved reliable and valid, future researchers would benefit from incorporating other methods of data collection, such as interviews or parent and teacher ratings. Second, the sample was restricted to junior high students in Taiwan. The generalizability of these findings needs to be examined in other racial, ethnic, and age groups.

Third, the regression procedure employed in the present research did not allow illumination of the pathways among adolescents' perfectionistic tendencies, implicit theories of intelligence, academic emotions, and self-regulation. The relatively small contribution of implicit views about intelligence in predicting outcome variables of interest might have resulted from a large proportion of shared variance between this set of predictors and perfectionism constructs. It is likely that perfectionism mediates the effect of implicit theories on a person's emotional and self-regulatory functioning. Further research using structural equation modeling to test the hypothesized path model is encouraged.

Fourth, future researchers should examine other mechanisms through which the two forms of perfectionism contribute to different emotional experiences and self-regulatory styles. The achievement goals that students endorse may be a promising choice in this respect (Elliot & Thrash, 2001). Specifically, adaptive versus maladaptive perfectionism may inspire individuals to pursue approach-oriented versus avoidance-oriented goals. Different types of achievement goals, in turn, lead students to employ different self-regulatory strategies to attain their goals and experience different emotions during the process of goal pursuit. Such an investigation is expected to provide more insight into exactly how perfectionism operates in an individual's self-regulatory process.

Finally, I did not explore the social and environmental influences on an individual's perfectionistic tendency. For example, the development of perfectionism has been viewed by a number of theorists as a product of children's interactions with their parents (Barrow & Moore, 1983; Burns, 1980; Missildine, 1963; Pacht, 1984). Further, perfectionistic tendencies formed within the family context may be maintained by the emphasis placed on achievement in the school (Kawamura et al., 2002). It would be informative to examine how parenting and teaching practices may affect individuals' adaptive versus maladaptive perfectionistic beliefs. Future researchers should extend the investigation into the effects of the family and classroom contexts on the subtypes of perfectionism that students adopt. Such research has the potential to help parents and teachers create environments fostering adaptive perfectionism and the associated patterns of self-regulation.

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