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An Examination of Academic Coping Among Taiwanese Adolescents

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ABSTRACT. The author explored the relations among Taiwanese eighth-grade students' satisfactions of the basic psychological needs (i.e., the needs for competence, relatedness, and autonomy), engagement versus disengagement coping with academic stress, self-regulated learning, and academic burnout. Three hundred and ninety-six eighth-grade Taiwanese students completed a self-reported survey assessing the variables described above. Findings of regression analyses indicated that the satisfactions of Taiwanese adolescents' basic psychological needs were the key factors determining their academic coping. The types of coping they adopted were found to be associated with their self-regulated learning and academic burnout. Further, results of multivariate analysis of covariance showed that even after controlling for the effects of the fulfillment of the basic psychological needs, students employing engagement coping reported significantly higher levels of self-regulated learning along with lower levels of burnout than did their counterparts using disengagement coping. Implications for educational practices are discussed.

Keywords: academic burnout, academic coping, basic psychological needs, self-regulated learning

Adolescence is a developmental stage at which individuals may experience a number of stressors including managing the physiological changes of puberty, achieving expectations of increasing independence from family, developing appropriate social roles with peers, and completing academic requirements (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Given that adolescents spend a large part of their lives in school environment and often evaluate themselves on the basis of academic performance (Ang & Huan, 2006), schools can be stressful for adolescent students. Previous studies investigating the stressors most frequently encountered by adolescents found that they reported being bothered by a multitude of school-related events such as bad grades on test, not knowing how to complete homework, not understanding the material presented in class, and anxiety about not being able to answer if asked by the teacher (de Anda et al., 2000; Skinner & Wellborn, 1997; Suldo, Shaunessy, & Hardesty, 2008). When students face these obstacles, interferences, and failures, an essential factor that may influence student success and satisfaction in

school concerns academic coping, that is, how students interpret and react to academic challenges, setbacks, and difficulties (Krypel & Henderson-King, 2010; Skinner & Wellborn, 1997).

It has been found that academic stress constitutes a significant and pervasive risk factor for maladjustment in the school context (Mantzicopoulos, 1990). Although successful coping with academic demands is important to adolescent well-being, little research examines adolescents' coping in the academic domain (Suldo et al., 2008). Findings from research on the determinants and efficacy of academic coping in adolescence should provide valuable information about the malleability of coping and how to devise interventions that can facilitate students at this stage to effectively cope with academic stress. In addition, previous studies have been limited to primarily Caucasian samples and have not explored coping and school adjustment in more diverse populations (Compas et al., 2001). To address these issues, in the present study, Taiwanese adolescents' academic coping was investigated.

Dimensions of Coping

There has been little consensus about the dimensions or categories that best discriminate among different academic coping strategies in adolescence. Two widely adopted perspectives, both adapted from the adult literature, are problem-versus emotion-focused coping and engagement versus disengagement coping (Compas et al., 2001; Skinner & Wellborn, 1997). The distinction between problem- and emotion-focused coping is derived from the Lazarus and Folkman's (1984) model of stress and coping. In their model, coping is defined as cognitive and behavioral efforts one undertakes to manage demands that are appraised as taxing or exceeding one's resources. When the individual encounters a stressful event that is perceived as taxing his or her resources, the process of coping begins. The coping

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efforts can be directed at the stressor itself (i.e., problem-focused coping). For instance, the person may generate possible solutions to a problem and take actions to change the circumstances that are creating stress. Emotion-focused coping, on the other hand, is aimed at minimizing the emotional distress arising from stressors. This type of coping includes such responses as self-soothing (e.g., relaxation), expression of negative emotions (e.g., yelling or crying), seeking emotional support from others, and attempts to escape stressful situations (Carver & Connor-Smith, 2010; Compas et al., 2001).

Despite the broad use of Lazarus and Folkman's (1984) model of coping in previous studies, criticism of such a distinction is also widespread. A primary reason for the criticism is that some emotion-focused responses are very different from each other. There are quite a few disparate types of coping within one category. Accordingly, they may have very divergent implications for an individual's success in coping (Carver, Scheier, & Weintraub, 1989). Considering such criticism, the present research adopted the distinction between engagement and disengagement coping to examine Taiwanese adolescents' academic coping responses. After reviewing a range of coping distinctions and groupings, Carver and Connor-Smith (2010) concluded that the engagement versus disengagement distinction appears to have greatest importance.

The distinction between engagement and disengagement coping has also obtained substantial attention in research with different populations including children, adolescents, and adults (Compas et al., 2001). Engagement coping is organized, flexible, and benign. This type of coping is characterized by the responses that are oriented either toward the source of stress (e.g., problem-focused coping) or toward the person's emotions or thoughts (e.g., emotion regulation or cognitive restructuring). Disengagement coping refers to responses that are oriented away from the stressors such as withdrawal or denial. Instead of actively engaging in attempts to deal with a stressor, people employing disengagement coping may act as though the stressor does not exist or try to distract themselves from it (Carver & Connor-Smith, 2010; Compas et al., 2001; Krypel & Henderson-King, 2010). Disengaging from the stressor may allow the individual to avoid negative emotions associated with the threat in the short term. This kind of coping, however, is generally ineffective in alleviating stress in the long run, for it does nothing about the stressor's existence and its eventual impact (Carver & Connor-Smith, 2010).

The Motivational Model of Academic Coping

There is evidence that motivational variables play a critical role in students' use of coping strategies (Krypel & Henderson-King, 2010). Successful coping with academic stress is, to a great extent, dependent on the perceived availability and effectiveness of such coping resources as

traits, abilities, and assets at hand (Lazarus & Folkman, 1984). Coping resources are conceptualized as factors that determine subsequent coping strategies. If adequate coping resources are available, they would bring out a cognitive transformation in how the stressor is perceived. When the individual perceives the stressful event as a healthy challenge, the potential or actual stress is often adequately addressed and eased (Mounopoulos, Ashby, & Gilman, 2006). Skinner and Wellborn (1997) posited that people's self-system processes organized around competence, relatedness, and autonomy serve as intrapersonal resources that guide their coping in stressful encounters. According to this perspective, school environments are stressful to the degree that they challenge or threaten students' basic psychological needs, namely, the needs for competence, relatedness, and autonomy (Skinner & Edge, 2002).

The need for competence has been well studied by researchers in the academic domain (Skinner, 1995). Competence refers to the need to feel efficacious while interacting with the social environment, such as completing a learning task. It constitutes the underlying processes of control (Bandura, 1997; Weiner, 1986). Plenty of research findings show that one's sense of control over desired and undesired outcomes shapes how he or she responds to stressful situations (Folkman, 1984; Skinner & Edge, 2002). People who believe that they are efficacious at overcoming obstacles tend to interpret failures and stressors as challenges, to adopt engagement coping, and to remain optimistic in the face of difficulties. By contrast, those who lack a sense of competence are inclined to panic when faced with setbacks, to become pessimistic and doubting, and to use disengagement coping to escape the stressor if possible (Bandura, 1997; Dweck, 1999; Folkman, 1984; Skinner, 1995; Weiner, 1986).

The need for relatedness also functions as a part of the self-system processes. Relatedness refers to the need to love and be loved by others. Moreover, when this need is met, one experiences oneself as a valued member of a group or community (Ainsworth, 1989). Social support may act as a buffer against psychological distress. People having loving relationships cope with stress better than those who are more socially isolated (Skinner & Edge, 2002). The self-processes of relatedness have been conceptualized as individuals' convictions about their own lovability and their expectations that social partners can be trusted to be warm and available when needed. Children with maladaptive mindsets about relatedness react to stressful events with anxiety and expectations for severe consequences. Thus, they are more likely to adopt disengagement coping to conceal problems. In contrast, students whose needs for relatedness are taken care of react to potential threats with little distress and with active attempts to solve the problems (Skinner & Wellborn, 1997).

Self-determination theory (SDT; Ryan & Deci, 2000) postulates that all people intrinsically desire to be autonomous. Autonomy refers to the need to experience one's

behavior as freely chosen and volitional. According to SDT, certain practices in school (e.g., graded performance or competition) are viewed by students as stressful. The reason is that these practices undermine students' autonomy. Students with low autonomy tend to respond to challenging situations with high distress and frustration. In contrast, when students undertake learning tasks with higher levels of autonomy, they utilize engagement coping to overcome obstacles. Specifically, they react to difficulties with interest and flexibility. Further, they construe environmental feedback as information that can be used to guide performance rather than pressure to conform in some fashion (Skinner & Wellborn, 1997).

Skinner and her colleagues (Skinner & Edge, 2002; Skinner & Wellborn, 1997) maintained that people's appraisals of potentially stressful events as threats to the three psychological needs are crucial mechanisms that bring about individual differences in coping. It was expected that the satisfactions of the needs for competence, relatedness, and autonomy should influence whether the student regards academic difficulties as a signal for more engagement or, instead, as an indication that the fundamental psychological needs are threatened and thus respond to the difficulties with anxiety and avoidance. By exploring the relations between the satisfactions of the three basic needs and engagement versus disengagement coping in the present study, it was hoped that the exact role of competence, relatedness, and autonomy in one's academic coping would be determined.

Outcomes Associated with Engagement Versus Disengagement Coping

Individuals' engagement versus disengagement coping in school may be central predictors of self-regulated learning and academic burnout. Previous findings (Brdar, Rijavec, & Loncaric, 2006; Skinner & Wellborn, 1997) revealed that students inclined to utilize approach strategies to cope with academic stress (i.e., engagement coping) appear to maintain vigorous interactions with academic material. For instance, they reflect on class material and try to relate it to personal experiences. They tend to have good time management skills when it comes to homework completion and exam preparation, to take personal responsibility for learning by showing more effort, persistence, concentration, interest, as well as enthusiasm, and to actively seek novelty and challenge. Put differently, engagement coping is thought to lead to the development of a repertoire of actual competences characterized as self-regulated learning.

In contrast, disengagement coping is presumed to restrain learning and to hinder adjustment (MacCann, Fogarty, Zeidner, & Roberts, 2011). Escaping distress resulting from the academic stress does not help to solve the problem. For many stresses, the longer the person delays to deal with the problem, the more intractable it becomes (Carver & Connor-Smith, 2010). As a consequence, students who adopt disengagement coping to handle academic demands are likely to become passive, withdrawn, anxious, and depressed. They are apt to refrain from taking part in class activities and to shy away from novelty (Skinner & Wellborn, 1997). A majority of these characteristics mirror the components of academic burnout. Academic burnout refers to a psychological syndrome that occurs due to chronic academic stress and course loads, manifested as an emotional exhaustion because of study demands, a cynical and detached attitude toward schoolwork, and a reduced efficacy as a student (Gan & Shang, 2007; Zhang, Gan, & Cham, 2007).

In Asian societies, academic stress is even more intense due to the familial and cultural demands for academic excellence. Education is highly valued in countries such as China, Taiwan, Singapore, Hong Kong, Japan, and Korea because academic achievement is viewed as the main way of moving up along the social ladder in these societies (Ang & Huan, 2006; Tan & Yates, 2011). As mentioned previously, academic pressures constitute a main source of stress during adolescence. Adolescent students, who are already in a vulnerable developmental stage, are supposed to be at increased risk for academic burnout. Nevertheless, the vast majority of research on academic burnout has been conducted in the context of college students (Jacobs & Dodd, 2003). Little is known about burnout among adolescent students. To address the paucity of literature in this area, in the present study I attempted to examine the effects of junior high school students' academic coping on burnout in the Taiwanese classroom context.

The Present Study

To sum up, there were three purposes of this study. First, the relations between the satisfactions of the three basic psychological needs (i.e., the needs for competence, relatedness, and autonomy) and engagement versus disengagement coping were investigated in the hope that the extent to which these intrapersonal resources functioned as the antecedents of different types of academic coping could be determined. The second purpose of this study was to examine the relations of engagement versus disengagement coping to students' self-regulated learning and academic burnout to identify which coping strategies were most predictive of adaptive and maladaptive achievement-related outcomes. Finally, the differences in self-regulated learning and academic burnout between students oriented toward engagement versus disengagement coping were examined while controlling for the satisfactions of the three basic needs. In doing so, the more precise effects of different types of academic coping on self-regulated learning and academic burnout were assumed to be captured.

Method

Participants

The participants included 396 eighth-grade Taiwanese students from 14 classes in four junior high schools. Participating schools were located in the northern part of Taiwan. All of school principals granted initial consent for data to be collected in their schools. The 196 boys (49.5%) and 200 girls ranged in age from 12 years, 3 months to 15 years (M age = 13 years, 6 months; SD = 3.8 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. Students' participation was voluntary. 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 (September 2012). Students were invited to fill out a survey (described in detail subsequently) during regular class time. There were two research assistants in each class for the data collection. They assured students of the confidentiality of their self-reports and encouraged them to respond to all items as accurately as possible.

Measures

Participants were instructed to respond to all items on 5-point Likert-type scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A Chinese version of this self-report survey was employed. 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 full account of linguistic and cultural differences among Taiwanese adolescents. Participants' familiarity with item format, item content, and test procedures was ensured by checking with two Taiwanese junior high students during translation. Also, appropriate statistical techniques were selected to establish the equivalence between the different language versions of the measure. Information on the reliability and validity of the adapted versions is detailed subsequently.

Academic coping strategies. Students' use of academic coping strategies was assessed by the scale adapted from the Coping Orientations to Problems Experienced (COPE) inventory developed by Carver et al. (1989). This inventory was used to measure the ways in which the general population respond to stress across different situations. Given that the present study was intended to investigate students' coping responses in academic settings, the word

problem in the original items was changed to *academic problem* when students' tendencies to cope with academic stress were assessed. The adapted academic coping inventory consists of two scales. Engagement coping comprises three subscales (i.e., active coping: "I take additional action to try to get rid of the academic problem," four items; planning: "I think about how I might best handle the academic problem," four items; suppression of competing activities: "I put aside other activities in order to concentrate on schoolwork," two items; Cronbach's α = .91). Disengagement coping comprises of four items (e.g., "I reduce the amount of effort I am putting into solving the academic problem," Cronbach's α = .72). A confirmatory factor analysis was completed because the very method provided a promising avenue for testing theory-driven models of the subtypes of coping (Compas et al., 2001). Maximum likelihood was used as the estimation method, for it is the most common estimation procedure that has desirable mathematical and optimality properties (Hoyle & Panter, 1995). In the model tested, items from each subscale were hypothesized to load only onto their respective latent variables. Results indicated that this model represented a good fit for the proposed structure of the scale, $\chi^2(76, N = 396) = 205.80$, $p < .05$, $\chi^2/N = .52$; root mean square error of approximation (RMSEA) = .05, goodness of fit index (GFI) = .93, normed fit index (NFI) = .97, nonnormed fit index (NNFI) = .99, comparative fit index (CFI) = .99, incremental fit index (IFI) = .99, relative fit index (RFI) = .97.

Satisfactions of the basic psychological needs. Students' satisfactions of the basic psychological needs were assessed by the scale adapted from the Basic Need Satisfaction at Work Scale (Baard, Deci, & Ryan, 2004). This scale was used to measure the extent to which students experience satisfactions of their needs for competence (e.g., "Most days I feel a sense of accomplishment from learning," four items; Cronbach's α = .82), relatedness (e.g., "My classmates are pretty friendly toward me," four items; Cronbach's α = .75), and autonomy (e.g., "I feel like I can pretty much be myself in my classroom" four items; Cronbach's α = .79). A confirmatory factor analysis was performed to test the validity of the scale. In the model tested, items from each subscale were hypothesized to load only onto their respective latent variables. Results showed that this model yielded an adequate fit to the data, $\chi^2(48, N = 396) = 194.90$, $p < .05$, $\chi^2/N = .49$, RMSEA = .07, GFI = .93, NFI = .97, NNFI = .97, CFI = .98, IFI = .98, RFI = .95.

Self-regulated learning. Students' self-regulated learning was measured by the Self-Regulation Scale (Lin, 2006). The scale was developed to assess students' tendencies to invest effort and employ effective cognitive strategies when undertaking schoolwork (e.g., "When I encounter difficulties completing academic assignments and want to

give up, I always tell myself to keep persisting," 13 items; Cronbach's $\alpha = .93$). A confirmatory factor analysis was also run to examine the validity of this scale. In the model tested, all the items were hypothesized to load on to one latent construct. Results showed that this model provided a reasonable fit to the data, $\chi^2(65, N = 396) = 237.36$, $p < .05$, $\chi^2/N = .60$, RMSEA $= .07$, GFI $= .91$, NFI $= .98$, NNFI $= .98$, CFI $= .99$, IFI $= .99$, RFI $= .97$.

Academic burnout. Students' academic burnout was assessed by the scale adapted from the Maslach Burnout Inventory–Student Survey (MBI-SS; Schaufeli, Martinez, Marques Pinto, Salanova, & Bakker, 2002). The adapted survey consists of 13 items that constitute three scales: exhaustion (e.g., "I feel emotionally drained by my studies," five items; Cronbach's $\alpha = .84$), cynicism (e.g., "I doubt the significance of my studies," four items; Cronbach's $\alpha = .83$), and lack of efficacy (e.g., "I can effectively solve the problems that arise in my studies," four items; Cronbach's $\alpha = .76$). The items measuring efficacy were reverse scored. A confirmatory factor analysis was performed to test 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 adequate fit for the proposed structure of the scale, $\chi^2(62, N = 396) = 232.92$, $p < .05$, $\chi^2/N = .59$, RMSEA $= .07$, GFI $= .91$, NFI $= .96$, NNFI $= .97$, CFI $= .97$, IFI $= .97$, RFI $= .95$.

Results

Regression Analyses

Descriptive information and correlations for study variables are shown in Table 1. Results from regression analyses are presented first for outcomes regarding academic coping and then for self-regulated learning and academic burnout. For the regressions predicting students' academic coping, the satisfactions of the basic psychological needs (i.e., the

needs for competence, relatedness, and autonomy) were included as predictors. For the regressions predicting students' self-regulated learning and academic burnout, the two types of academic coping (i.e., engagement and disengagement coping) were entered in the model as predictors. In the preliminary analysis, gender was entered in regression models. It turned out that gender failed to predict any outcome variable of interest. Therefore, gender was not included as a predicting variable in the present study. 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 (Wolters, 2004).

Regressions Predicting Students' Use of Academic Coping Strategies

Results of regression analyses revealed that the amount of variance (51%) explained by the satisfactions of the three basic psychological needs were significant for students' use of engagement coping strategies, $F(3, 392) = 133.31$, $p < .001$. The satisfactions of the needs for competence, relatedness, and autonomy all significantly predicted engagement coping ($\beta = .44$, $p < .001$; $\beta = .18$, $p < .001$; and $\beta = .22$, $p < .001$, respectively). The satisfactions of the basic psychological needs accounted for a significant portion of the variance (13%) in disengagement coping, $F(3, 392) = 19.54$, $p < .001$. Competence need satisfaction was the only significant predictor of students' use of disengagement coping strategies ($\beta = -.20$, $p < .001$). Table 2 provides the results of regressions predicting each type of academic coping. These results are also demonstrated in Figure 1.

Regressions Predicting Students' Self-Regulated Learning and Academic Burnout

Table 3 displays the results of regressions predicting students' self-regulated learning and academic burnout. In

TABLE 1. Descriptive Statistics and Correlations for Study Variables (N = 396)

Variable	1	2	3	4	5	6	7	8	9
1. Engagement coping	—								
2. Disengagement coping	−.38**	—							
3. Competence need satisfaction	.65**	−.32**	—						
4. Relatedness need satisfaction	.53**	−.29**	.51**	—					
5. Autonomy need satisfaction	.56**	−.29**	.55**	.57**	—				
6. Self-regulated learning	.82**	−.35**	.61**	.42**	.42**	—			
7. Emotional exhaustion	−.41**	.37**	−.39**	−.30**	−.21**	−.42**	—		
8. Cynicism	−.49**	.43**	−.43**	−.34**	−.26**	−.51**	.74**	—	
9. Lack of efficacy	−.72**	.35**	−.65**	−.51**	−.46**	−.70**	.28**	.39**	—
M	3.40	2.30	3.35	3.98	4.15	3.22	3.02	2.78	2.54
SD	0.78	0.79	0.85	0.73	0.80	0.85	0.97	1.03	0.83

**p < .01.

TABLE 2. Summary of Regression Analyses Predicting Academic Coping (N = 396)

	Engagement coping			Disengagement coping		
Variable	β	t	R^2	β	t	R^2
Competence need satisfaction	.44***	4.70		−.20***	−3.29	
Relatedness need satisfaction	.18***	9.87		−.12	−2.13	
Autonomy need satisfaction	.22***	4.08		−.11	−1.79	
			.51			.13

***$p < .001$.

this section of analyses, engagement and disengagement coping were entered and explained a significant amount of variance (67%) in students' self-regulated learning, $F(2, 393) = 402.70$, $p < .001$. Engagement coping emerged as the only significant predictor of self-regulated learning ($\beta = .80$, $p < .001$). In terms of the indicators of academic burnout, results of regression analyses showed that the two types of academic coping accounted for a significant amount of the variance (22%) in emotional exhaustion, $F(2, 393) = 56.09$, $p < .001$. Engagement coping was found to negatively predict emotional exhaustion ($\beta = -.31$, $p < .001$), whereas disengagement coping was positively related to students' exhaustive feelings ($\beta = .26$, $p < .001$).

The amount of variance (31%) explained by the two types of academic coping was significant for cynicism, $F(2, 393) = 88.87$, $p < .001$. Engagement coping again negatively predicted cynicism ($\beta = -.39$, $p < .001$). By contrast, the use of disengagement coping strategies was positively associated with students' cynical attitudes toward schoolwork ($\beta = .28$, $p < .001$). Finally, academic coping predicted a significant portion of the variance (52%) in the lack of efficacy, $F(2, 393) = 215.78$, $p < .001$. Engagement coping was found to be negatively correlated with the lack of efficacy ($\beta = -.69$, $p < .001$).

Disengagement coping, on the other hand, failed to predict this aspect of academic burnout. Results of this section of regression analyses are summarized in Figure 2.

Differences Between Students Using Engagement Versus Disengagement Coping Strategies

To determine the differences in self-regulated learning and academic burnout between students using engagement versus disengagement coping strategies, a multivariate analysis of covariance (MANCOVA) was performed while including the satisfactions of the needs for competence, relatedness, and autonomy as covariates. By taking into account the satisfactions of the basic psychological needs, it was hoped that the effects of engagement versus disengagement coping on students' self-regulated learning and experienced burnout would be detected with greater precision. Adolescents who scored above the mean on engagement coping and below the mean on disengagement coping were grouped as engaged students. By contrast, those who scored above the mean on disengagement coping and below the mean on engagement coping were identified as disengaged students. In total, 237 of 396 students met the criteria, including 128 engaged students and 109 disengaged
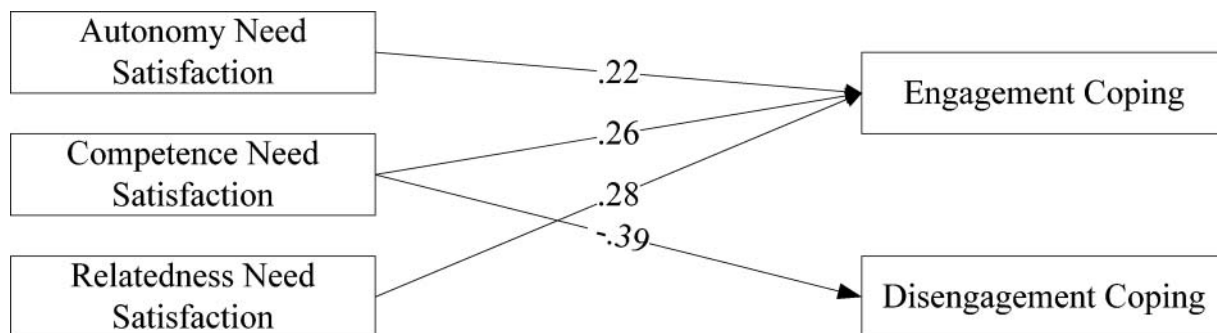

FIGURE 1. Path model of the relations between the satisfactions of the basic psychological needs and academic coping. *Note.* Only significant paths are shown.

TABLE 3. Summary of Regression Analyses Predicting Self-Regulated Learning and Academic Burnout (N = 396)

Variable	Self-regulated learning			Emotional exhaustion			Cynicism			Lack of efficacy		
	β	t	R^2	β	t	R^2	β	t	R^2	β	t	R^2
Engagement coping	.80***	25.63		−.31***	−6.47		−.39***	−8.53		−.69***	−18.21	
Disengagement coping	−.05	−1.61		.26***	5.32		.28***	6.27		.09	2.38	
			.67			.22			.31			.52

***$p < .001$.

students. The means and standard deviations of the dependent variables according to these students' group membership are displayed in Table 4.

Two assumptions for the MANCOVA had been examined before the analysis was conducted. First, Box's M test was performed to check for the homogeneity of covariance matrices. The result of this test was not significant, suggesting the confirmation of this assumption. Additionally, the test for homogeneity of regression also yielded insignificant results. Hence, using a common regression coefficient to adjust for the covariate in both groups was appropriate. The MANCOVA revealed significant effects for the use of engagement versus disengagement coping strategies on students' self-regulated learning and academic burnout, Hotelling's $T = .72$, $F(4, 229) = 22.76$, $p < .001$, $\eta^2 = .29$.

Results of the univariate analyses indicated significant effects on self-regulated learning, $F(1, 232) = 76.87$, $p < .001$, $\eta^2 = .25$, emotional exhaustion, $F(1, 232) = 11.49$, $p < .001$, $\eta^2 = .05$, cynicism, $F(1, 232) = 23.28$, $p < .001$, $\eta^2 = .09$, and the lack of efficacy, $F(1, 232) = 41.17$, $p < .001$, $\eta^2 = .15$. Engaged students scored significantly higher than did disengaged students on self-regulated learning (adjusted M = 3.72 vs. adjusted M = 2.76, respectively). Conversely, disengaged students reported significantly higher levels of emotional exhaustion (adjusted M = 3.23 vs. adjusted M = 2.72, respectively), cynicism (adjusted M = 3.06 vs. adjusted M = 2.34, respectively), and the lack of efficacy (adjusted M = 2.88 vs. adjusted M = 2.21, respectively) than did engaged students. Evidently, after controlling for the effects of the satisfactions of the basic psychological needs, Taiwanese adolescents' self-regulated learning and burnout experiences varied as a function of the use of different types of academic coping strategies.
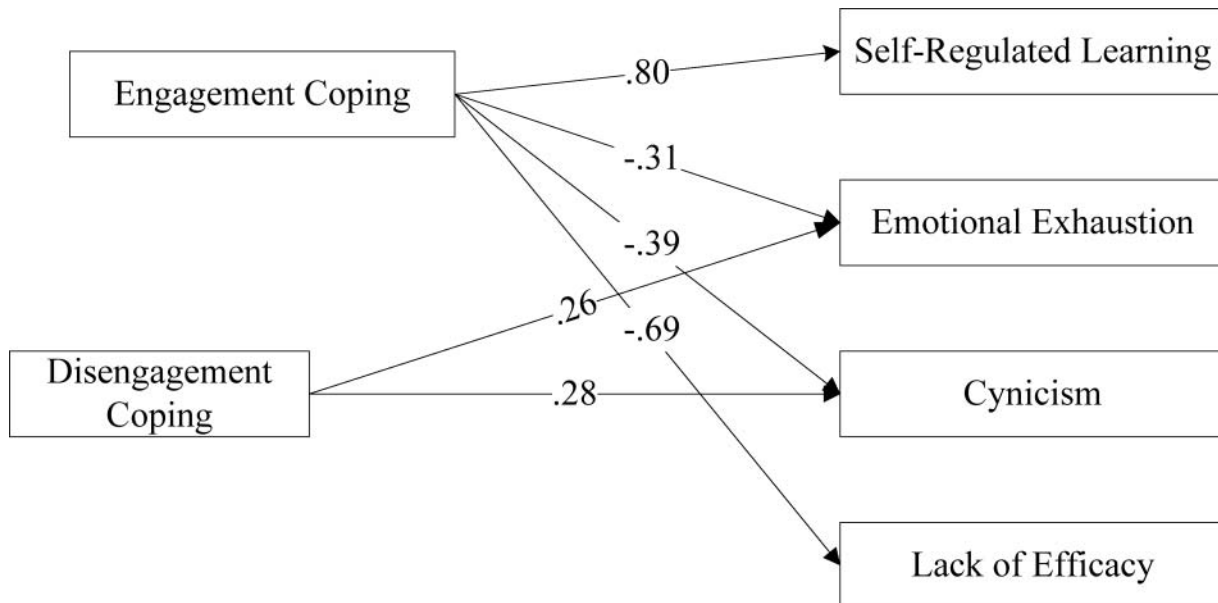

FIGURE 2. Path model of the relations between academic coping, self-regulated learning, and academic burnout. *Note.* Only significant paths are shown.

TABLE 4. Differences Between Students Adopting Engagement Versus Disengagement Coping

Variable	Engaged students ($n = 128$)		Disengaged students ($n = 109$)		F (univariate analyses)
	M	SD	M	SD	
Self-regulated learning	3.88 (3.72)$_a$	0.58	2.58 (2.76)$_b$	0.71	76.87***
Emotional exhaustion	2.51 (2.72)$_b$	0.82	3.47 (3.23)$_a$	0.94	11.49***
Cynicism	2.12 (2.34)$_b$	0.80	3.32 (3.06)$_a$	0.96	23.28***
Lack of efficacy	1.97 (2.21)$_b$	0.57	3.15 (2.88)$_a$	0.74	41.17***

Note. Means within the parentheses were adjusted for the covariate. Different subscripts denote statistically significant differences ($p < .05$) in means according to Tukey's criteria.
***$p < .001$.

Discussion

Findings of the present study enhance the understanding of the predicting factors and predicted outcomes of academic coping within the Taiwanese context. The research on coping has been confined almost exclusively to Caucasian sample. There is clearly a need to extend this line of research by investigating individuals of more diverse backgrounds (Compas et al., 2001). The present findings thus contribute to the expansion of the existing knowledge base about factors related to adolescents' academic coping. Results of this study suggest that the satisfactions of Taiwanese adolescent students' needs for competence, relatedness, and autonomy are the vital mechanisms affecting their tendencies to cope with academic stress. Also, the coping strategies that adolescents use are found to be linked not only to their self-regulated learning, but also to experienced academic burnout. Moreover, results of MANCOVA indicate that even after controlling for the effects of the fulfillment of the basic psychological needs, students adopting engagement coping report significantly higher levels of self-regulated learning coupled with lower levels of burnout than do their counterparts using disengagement coping. Below, several important findings are discussed in more detail.

The Relations of the Basic Psychological Needs to Academic Coping

Skinner and Wellborn's (1997) motivational model of academic coping proposed that the fulfillment of people's needs for competence, relatedness, and autonomy constitutes their self-system processes that function as intrapersonal resources directing the tendencies to cope with academic demands. Findings of the present study sustain the proposition of this model. Results of regression analyses indicate that the satisfactions of the three types of needs emerge as significant predictors of engagement coping. Further, over half of the variance (51%) in engagement coping is accounted for by these basic psychological needs. This relatively large amount of explained variance

illustrates the pivotal role of students' self-system processes organized around competence, relatedness, and autonomy in their orientations toward engagement coping.

As stated previously, the availability of adequate coping resources, to a large extent, shapes how one perceives the stressors. The satisfactions of the basic psychological needs enable students to view academic stress as a healthy challenge and therefore to be willing and prepared to assume responsibility (Mounopoulos et al., 2006). Each component of the self-system processes individually contributes to adolescents' decision to adopt engagement coping. Students who are sure of their ability (i.e., competence need satisfaction) tend to take on the challenge directly. Participants whose need for relatedness is met are expected to respond to academic stress with little anxiety and fear. The social support that they receive through loving relationships may encourage them to take actions to solve the problem caused by the stress. In the similar vein, students with higher levels of autonomy are usually committed to their learning volitionally. It is hence not surprising that they are inclined to react to difficulties encountered in the academic context with more engagement efforts.

Whereas the fulfillment of all the three basic psychological needs significantly predicts engagement coping, competence need satisfaction emerges as the only significant predictor of disengagement coping. Adolescents who are not efficacious enough at taking on schoolwork are apt to employ coping strategies such as withdrawal or denial to stay away from academic stress. These findings clearly underscore the need to pay close attention to students' perceived competence when it comes to facilitating adaptive coping. The fulfillment of need for competence may not only foster students' engagement with academic obstacles, but also lessen their tendencies to adopt disengagement coping to avoid the stressors.

The Relations of Academic Coping to Self-Regulated Learning and Burnout

In regard to the relations between academic coping and students' self-regulated learning, the present findings

suggest that engagement coping positively predicts self-regulated learning and accounts for two thirds of the variance in this outcome variable. The considerably powerful effects of engagement coping on self-regulated learning lend support to the notion that this type of coping enables students to construct a series of self-regulatory strategies in order to stay actively involved with academic material (Brdar et al., 2006). In addition to acting as a positive predictor of self-regulated learning, engagement coping is found to be negatively related to all the three dimensions of academic burnout. Adolescents who utilize engagement coping to tackle academic difficulties report lower levels of emotional exhaustion, cynical attitudes toward school learning, as well as feelings of incompetence and a lack of achievement at schoolwork.

The previous findings are noteworthy, given that results of a recent survey conducted in Taiwan suggested that academic burdens were the primary sources of stress that Taiwanese adolescents experienced because of cultural pressures for academic excellence. Over one third (35.9%) of the 2,133 surveyed adolescents often felt "exhausted and drained" after a day of school (Soong, 2011). The inverse relations of engagement coping to all the indicators of burnout found in the present study have significant implications for addressing adolescents' burnout due to chronic academic stress. When students are faced with academic obstacles, guiding them to respond to the source of stress directly may effectively help to alleviate each facet of academic burnout. In particular, engagement coping alone explained more than half of the variance (52%) in the lack of efficacy. In light of this very finding, the efforts that students expend to overcome academic difficulties are likely to substantially raise their perceived control over the stressor.

In contrast to the negative effects of engagement coping on academic burnout, disengagement coping is found to predict emotional exhaustions and cynicism positively. Whereas students' coping responses toward the source of stress itself may relieve burnout, disengaging oneself from academic demands appears to heighten the levels of exhaustion and cynicism. When students cope with difficulties encountered in the academic setting by avoidance and denial, such responses may paradoxically promote an increase in intrusive thoughts about the stressors together with negative mood and anxiety (Najmi & Wegner, 2008). This apparently explains the present findings that coping responses that are oriented away from the stressors themselves seem to give rise to feelings of being depleted of emotional resources and indifferent attitudes toward schoolwork.

The significant influences of engagement versus disengagement coping on adolescents' self-regulated learning and academic burnout are further corroborated by results of MANCOVA. As reported earlier, the satisfactions of the basic psychological needs account for a significant portion of variance in academic coping. Nevertheless, even

after taking into consideration the fulfillment of these needs, there exist differences in self-regulated learning and all the aspects of academic burnout between students adopting engagement coping and those who are oriented to disengagement coping. Regardless of whether students' needs for competence, relatedness, and autonomy are met, the manners in which they choose to cope with academic obstacles uniquely contribute to their self-regulated learning and experiences of burnout. Adolescents who espouse engagement coping report significantly higher levels of self-regulation coupled with lower levels of burnout across all the indicators than do their counterparts adopting disengagement coping. An implication that can be drawn from this finding is that interventions developed to alter students' academic coping tendencies may bring about significant changes in terms of self-regulation and academic burnout.

Implications for Education

Results of the present research sustain the motivational model of academic coping proposed by Skinner and Wellborn (1997). Namely, the satisfactions of adolescents' needs for competence, relatedness, and autonomy should be the focus of interventions if engagement coping is to be fostered. When these needs are met, changes in academic coping responses are supposed to result. These basic psychological needs can be fulfilled by addressing the social context of schools (Connell & Wellborn, 1991; Skinner & Wellborn, 1994). First, classroom settings that provide structure are presumed to promote the individual's perceived competence. Structure refers to the amount and clarity of information that teachers communicate to students about expectations and how those expectations can be realized. Examples of teacher-provided structure may include establishing goals, giving directions, introducing procedures, setting standards, offering guidelines, and providing feedback (Jang, Reeve, & Deci, 2010). Provision of structure propels students to enact effective strategies that may prevent them from construing setbacks as signs of incompetence. In turn, students are likely to be focused on active problem solving when obstacles arise (Skinner & Wellborn, 1997).

Second, adolescents' needs for relatedness can be fulfilled when teachers establish warm and trusting relationships with their students. The connectedness that students feel in the classroom context may lead them to engage in help seeking in times of academic difficulties. It is also critical to promote positive peer relationships because as students make the transition into adolescence, they show increased interest in peers and spend a greater amount of time with them compared to parents or other adults (Csikszentmihalyi & Larson, 1984). Teachers can nurture positive and constructive peer relationships by employing such learner-centered practices as cooperative learning as opposed to teacher-centered practices (e.g., focusing on

evaluation and competition). Cooperative learning encourages students to interact while working on assignments. Students accordingly build relationships with peers while making academic progress (Roseth, Johnson, & Johnson, 2008). It has been found that in the classroom where cooperative learning practices are implemented, students are less likely to be socially isolated or rejected by their classmates. Further, they enjoy greater numbers of friends and experience more diversity and stability in their friendships (Urberg, Degirmencioglu, Tolson, & Hallidayscher, 1995).

Third, students' needs for self-determination can be met by teachers' provision of autonomy support. In the classroom environment, autonomy support occurs as the teacher takes the student's perspective, allows opportunities for self-initiation and choice, provides a meaningful rationale for the requirement, and acknowledges the student's feelings while minimizing the use of pressures and demands (Deci, Eghrari, Patrick, & Leone, 1994). These practices allow students to experience their interactions with academic activities and materials as more self-determined. Such resulting autonomous motivation should lead them to cope with necessary constraints in a more flexible and constructive manner (Skinner & Wellborn, 1997).

In addition to interventions designed to nurture engagement coping, adolescents may be able to overcome academic burnout stemming from the tendency to disengage by raising awareness of their coping strategies. Students who are apt to adopt disengagement coping can be instructed to recognize when they are disengaging from academic demands and to deal with problems more directly (Krypel & Henderson-King, 2010).

Limitations and Future Research

Although the results of the present study provide insights into educational practices, there are several limitations that need to be addressed in the future research. First, the present study is focused on the investigation of the fulfillment of adolescents' basic psychological needs functioning as the coping resources. Future researchers should explore how other likely antecedents of academic coping such as attributional styles affect one's use of coping strategies. Students who employ disengagement rather than engagement coping may do so because they believe that there is nothing they can do to alter the situations. In other words, they may adopt uncontrollable attributions for failure experiences (Struthers, Perry, & Menec, 2000). The examination of the relations between attributional styles and academic coping should provide information about attributional retraining that may promote thoughts to directly cope with academic demands.

Second, even though findings of the present study substantiate the motivational model of academic coping posited by Skinner and Wellborn (1997), this study is cross-sectional and correlational in nature such that the

directions of the relationships among the variables cannot be determined for sure. Longitudinal studies that examine the hypothesized predictors and outcomes of academic coping across time are needed. The very research design should allow for the disentanglement of antecedents and consequences regarding coping. Such understanding has the potential for effective interventions that may boost adaptive coping in the academic context as well as school achievement.

An Extension of the Present Study

Aside from the previous suggestions about the ways to overcome the limitations of this study, a follow-up of the present study should pay attention to the relation of the social context to the individual's academic coping. Given that the satisfactions of the basic psychological needs are found to be the key determinants of academic coping, the follow-up study should examine the effects of structure, teacher involvement, and autonomy support provided in the classroom context on students' tendencies to cope when encountering academic stress. Research of this sort is expected to provide valuable insights into the malleability of coping and the ways in which the social context can facilitate effective academic coping.

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