Taiwanese Sixth Graders' Achievement Goals and Their Motivation, Strategy Use, and Grades: An Examination of the Multiple Goal Perspective

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Abstract

Using the trichotomous framework of achievement goals, in the present study I investigated the effects of different combinations of achievement goals on Taiwanese sixth graders' motivation, strategy use, and performance. 242 students completed a self-report survey assessing their achievement goal orientations and a range of outcomes including intrinsic motivation, self-handicapping, and the use of cognitive and metacognitive strategies. I collected students' grades from school records at the end of the semester. Results suggested that mastery goals were positively associated with Taiwanese students' motivation, cognitive engagement, and grades, regardless of their level of performance-approach orientation. Also, results validated the theoretical distinction within performance goals proposed by recently revised goal theory, that is, that performance-approach and performance-avoidance goals may lead to different consequences for motivation, cognition, and achievement. Specifically, performance-approach goals were adaptive in terms of children's use of cognitive strategies and their grades, whereas performance-avoidance goals were related to students' maladaptive motivation, namely, self-handicapping. Implications for education and future research are discussed.

Over the past several decades, achievement goal theory has emerged as the dominant framework for studying achievement motivation. As a cognitive approach to motivation, this framework provides a window into the psychological processes through which achievement behavior is created (Midgley et al., 1998; Nicholls, 1984; Pintrich & Schunk, 1996; Weiner, 1990). Achievement goals refer to the purposes or reasons for a person's pursuit in an achievement situation (Dweck & Leggett, 1988; Maehr, 1989). Originally, two qualitatively different
categories of goals were proposed (Ames, 1992; Dweck & Leggett, 1988; Harackiewicz, Barron, & Elliot, 1998; Maehr & Midgley, 1991; Nicholls, 1984; Wolters, Yu, & Pintrich, 1996). This dichotomous framework assumes that mastery goals (also referred to as learning goals or task involvement) orient individuals to increase their competence or achieve task mastery. In contrast, performance goals (also labeled as ego involvement) focus students on their ability and self-worth. Ability and self-worth are determined by outperforming peers on academic tasks or receiving public recognition for one's superior performance (Ames, 1992; Dweck, 1986; Nicholls, 1984).

Achievement Goals and Patterns of Self-Regulation

Much research has suggested that mastery and performance goals may foster different patterns of self-regulation (Ames, 1992; Ames & Archer, 1988; Bandura, 1986; Dweck, 1986; Dweck & Leggett, 1988; Pintrich, 2000b; Pintrich & Schunk, 1996; Urdan, 1997). To master material to be learned, students espousing mastery goals are expected to use cognitive and metacognitive strategies and expend effort. Accordingly, mastery goals are associated with a number of adaptive outcomes, including preference for challenging work (Ames & Archer, 1988; Elliott & Dweck, 1988), persistence in the face of setbacks (Elliott & Dweck, 1988), intrinsic motivation for learning (Butler, 1987; Meece, Blumenfeld, & Hoyle, 1988; Stipek & Kowalski, 1989), and the use of effective learning strategies (Ames & Archer, 1988; Meece et al., 1988; Nolen, 1988). In contrast, an emphasis on performance goals may lead students to view achievement tasks as measuring important aspects of themselves (e.g., ability). Hence, those who adopt performance goals tend to show helpless responses characterized by low ability attributions to explain failure, use of ineffective strategies, and decreases in task involvement when faced with failure (Farrell, 1985; Meece et al., 1988; Nicholls, Cheung, Lauer, & Patashnick, 1989; Nolen, 1988). Moreover, performance goals have more often been correlated with lower intrinsic motivation than have mastery goals (Ames & Archer, 1988; Archer, 1994; Duda & Nicholls, 1992; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997). In short, mastery goals are more likely to foster an adaptive pattern of achievement, whereas performance goals are generally seen as less adaptive in terms of subsequent motivation, strategy use, and performance (Pintrich, 2000a).

From a Dichotomous to a Trichotomous Framework of Achievement Goals

Although thus far the dichotomous framework of achievement goals has made significant contributions to the achievement motivation literature, some evidence has indicated that strong conclusions about the negative effects of performance goals may be premature (Harackiewicz et al., 1998; Urdan, 1997). Because performance goals orient people toward competence, such goals might promote adaptive achievement behaviors and lead to positive outcomes (Barron & Harackiewicz, 2000; Harackiewicz & Sansone, 1991). To clarify the effects of performance goals and determine the situations in which these goals are advantageous versus harmful, achievement goal theorists have reexamined the performance goal construct (Elliott & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997). Reconsiderations of the literature have suggested that this construct actually confounds theoretically distinct components, namely, the approach-oriented need to achieve and the avoidance-oriented fear of failure (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002).

To distinguish between two types of performance goals, Elliot and Church (1997) proposed an incorporation of Atkinson's (1957) and McClelland's (1951) two achievement motives (i.e., to approach success and to avoid failure) into the original performance-mastery dichotomy. The separation

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of performance-approach from performance-avoidance goals resulted in the tri-chotomous achievement goal framework (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Each of the three goals is supposed to be related to a distinct predictive profile. Mastery goals are expected to lead to a wide range of positive processes and outcomes mentioned previously. Performance-approach goals have been shown to be related to a number of adaptive learning variables such as higher aspiration, absorption during task engagement, and performance attainment (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot, McGregor, & Gable, 1999). Individuals who adopt performance-avoidance goals, in contrast, are more likely to experience threat-related affect while studying, want to escape evaluation, and become anxious prior to as well as during evaluation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Skaalvik, 1997).

Achievement Goals and Self-Handicapping

The distinction between the approach and avoidance components of performance goals also allows investigation of the differences in their relations to academic self-handicapping. 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 will serve as ready excuses for potential failure (Covington, 1992). Covington’s (1992) theory of self-worth posits that students’ attempts to maintain a positive self-image may determine their achievement behaviors in schools. Academic self-handicapping is a motivational strategy some students use to deflect others’ perceptions away from lack of ability should poor performance occur (Midgley & Urdan, 2001; Urdan & Midgley, 2001).

Given that self-handicapping is an example of avoidant behavior, it is presumed to be strongly associated with performance-avoidance goals. Nevertheless, because performance-approach goals are focused on how one appears to others, these goals may also be positively associated with self-handicapping. To determine the joint effects of performance-approach and performance-avoidance goals on children’s reported use of self-handicapping strategies as well as other variables of interest, in the current study I compared combinations of different levels of these two types of goals. I hoped that the comparisons would shed light on differences in students with varied achievement goal profiles.

A Multiple Goal Perspective

Because mastery and performance-approach goals are linked to different achievement outcomes, optimal motivation may require both types of goals. Empirical evidence has indicated that pursuing one type of goal does not necessarily exclude pursuit of the other (Ames & Archer, 1988; Bouffard-Bouchard, Boisvert, Vezeau, & Larouche, 1995; Harackiewicz et al., 1997; Middleton & Midgley, 1997). Further, using median splits to create groups of college students, Bouffard et al. (1995) found that students in the high-mastery/high-performance group had the best learning outcomes (e.g., the highest motivation, best strategy use, higher grades, etc.). Pintrich (2000a) also reported the enhanced effects of adopting both mastery and performance-approach goals on junior high school students’ achievement-related behaviors. As for younger students, Turner, Meyer, Midgley, and Patrick (2003) investigated the relations of combinations of classroom goal structures to sixth graders’ reported affect (e.g., negative affect following failure) and achievement behaviors (e.g., positive coping, academic self-regulation, etc.). They found that, depending on the instructional and motivational contexts within the classroom goal structures, a high-mastery/high-performance pattern could foster elementary students’ self-regulation. Little is known, however, about how multiple goal pursuit operates in cultural contexts other than Western societies. By examining the relation between pursuing both
mastery and performance-approach goals and Taiwanese elementary children’s academic performance, the present study was intended to enhance understanding in this area.

**Patterns of Multiple Goal Pursuit**

The pursuit of multiple goals could facilitate performance in four ways: (1) an additive pattern, (2) an interactive pattern, (3) a specialized goal pattern, and (4) a selective goal pattern (Barron & Harackiewicz, 2000, 2001). In an additive goal pattern, both mastery and performance-approach goals independently exert positive effects on a particular outcome. An interactive goal pattern is characterized by a positive mastery × performance-approach goal interaction effect on a single outcome. These two patterns are different in that in the case of the interactive goal pattern, positive performance-approach goal effects may depend on a high level of mastery goals (or vice versa).

Instead of enhancing a single outcome, in a specialized goal pattern, mastery and performance-approach goals exert independent effects on different outcomes. For instance, mastery goals have an effect on interest, whereas performance-approach goals affect actual performance. The goal patterns mentioned above address the situations in which individuals pursue multiple goals simultaneously. Finally, in the selective goal pattern, people may focus on one goal that is most relevant at a specific time. Achievement goals may be adaptive as a function of the situation in which the goal is pursued. Detection of the selective goal pattern requires a series of analyses yielding main effects of different goals on multiple outcomes at various points in time.

Because one purpose of the present study was to investigate the effects of espousing both mastery and performance-approach goals at the same time within the Taiwanese classroom context, I did not examine the selective goal pattern in this study. To identify any of the three other goal patterns, it is necessary to take into account multiple outcomes and test the independent as well as interactive effects of mastery and performance-approach goals on each outcome. Hence, in this study I selected a variety of achievement-relevant variables including motivation (i.e., intrinsic motivation and academic self-handicapping), cognitive engagement (cognitive and metacognitive strategy use), and performance for a more detailed analysis regarding patterns of multiple goal pursuit.

**The Taiwanese Classroom Context**

Harackiewicz and Sansone (1991) proposed a matching hypothesis suggesting that the effects of achievement goals might vary with the nature of educational contexts in which goals are pursued. Based on this hypothesis, students who strive to best peers may be optimally motivated in an educational context where competition is salient. The Taiwanese classroom, which is characterized by multidimensional achievement dynamics, thereby constitutes an ideal case for testing the matching hypothesis in terms of the benefits of pursuing multiple goals. In Chinese society, success in competitive national examinations is valued as a key to social mobility and good prospects. To prepare for these competitive examinations, Taiwanese students usually attend cram school at a young age. Within some elementary classrooms, test scores of sixth-grade students are even posted publicly so that children are motivated to attain higher ranks (Grant & Dweck, 2001; Salili, Chiu, & Lai, 2001). Additionally, pupils in Taiwan are influenced by Confucian doctrines such as “Being diligent in study means devoting one’s effort to it for a long time” (Confucius, Zi Zhang chapter). The cultural focus on effort enables Taiwanese students to demonstrate strong willingness to expend effort to achieve academic success (Stigler, Smith, & Mao, 1985). With these cultural backgrounds, Taiwanese students are highly likely to hold both mastery and performance goal orientations at the same time.

The competitive atmosphere prevalent
in Taiwanese elementary classrooms may help to clarify the question of developmental or age effects raised by Midgley, Kaplan, and Middleton (2001). These researchers indicated that in the United States, as students move up in grade level, the classroom context becomes more performance focused. Accordingly, when examining the individual's achievement goal adoption, the effects of age are often confounded with the effects of the learning environment. It is possible that college or middle-grade students already possess effective learning strategies for attaining their performance-approach goals (Harackiewicz, Barron, Pintrich, et al., 2002). Thus, in response to Midgley et al.'s (2001) call for more research on younger students, in the present study I explored the relations of Taiwanese sixth-grade students' goal orientations to their motivation, cognition, and achievement. I hoped that by studying elementary children in this context, the question about the relevance of a multiple goal perspective for younger students could be answered more clearly.

The Present Study

Given the multidynamic nature of the Taiwanese educational context, I investigated the effects of pursuing multiple goals (i.e., mastery and performance-approach goals) on Taiwanese children's motivation, cognitive engagement, and academic achievement. The combined effects of performance-approach and performance-avoidance goals on the same variables were also explored. Students can espouse different levels of the two dimensions of performance goals, and differential outcomes may result (Pintrich, 2000a). Accordingly, I created a 2 X 2 matrix of mastery and performance-approach goals, and a 2 X 2 matrix of performance-approach and performance-avoidance goals on median splits of children's achievement goal scores. For the 2 X 2 matrix of performance-approach and performance-avoidance goals, children were also divided into four groups (high performance-approach/low performance-avoidance, low performance-approach/high performance-avoidance, high/high, and low/low). Such a design allowed the effects of the two combinations (performance-approach goals combined with mastery goals vs. performance-approach goals combined with performance-avoidance goals) on students' patterns of learning to be compared. In doing so, I expected that the more adaptive goal profiles would be identified. Also, the likely varying effects of performance-approach goals when interacting with mastery versus performance-avoidance goals might be detected. In sum, the following research questions were addressed: (a) What are the relations among Taiwanese children's achievement goals, cognitive and metacognitive strategy use, intrinsic motivation, self-handicapping, and grades? (b) Do children's cognitive and metacognitive strategy use, intrinsic motivation, self-handicapping, and grades differ according to the combination of their mastery and performance-approach goal orientations? (c) Do children's cognitive and metacognitive strategy use, intrinsic motivation, self-handicapping, and grades differ according to the combination of their performance-approach and performance-avoidance goal orientations?

Method

Participants

The participants included 242 sixth-grade students from nine classes in three elementary schools in the northern part of Taiwan. The 120 girls (50%) and 122 boys ranged in age from 11 years, 1 month to 12 years, 4 months (M = 11 years, 7 months). The school districts were primarily middle class in terms of socioeconomic status. All of the participants were Taiwanese.
Procedure

The data were collected at the beginning of the year in sixth grade (October). Students were required to fill out a few questionnaires including an achievement goal questionnaire (Elliot & Church, 1997), the subscales of cognitive and metacognitive study strategies, as well as the intrinsic value scale from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & De Groot, 1990; Pintrich, Smith, Garcia, & McKeachie, 1993), and the self-handicapping questionnaire (Midgley, Arunkumar, & Urdan, 1996; Urdan, Midgley, & Anderman, 1998) during regular class time. Two trained research assistants were 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. One research assistant read the items aloud, and the other one walked around the room to check for skipped items and ensure quality responses.

Measures

Participants were instructed to respond to all items on five-point Likert scales ranging from 1 (not at all true of me) to 5 (very true of me). Because two of the questionnaires (achievement goal and MSLQ) were originally constructed for assessing college students, I reworded items according to Taiwanese elementary school children's learning experiences. Table 1 displays the description and sample items of all measures used.

Achievement goals. Students' goal orientations were assessed by scales adapted from Elliot and Church's (1997) achievement goals questionnaire. This questionnaire is composed of three six-item scales for each of the achievement goals in the trichotomous model. Three scores representing mastery, performance-approach, and performance-avoidance goals for each student were created accordingly. To test the validity of partitioning the goal orientations into several components, Elliot and Church (1997) conducted a principal-components factor analysis with varimax rotation on the 18 items. Three factors were extracted from the analysis. Factor 1 accounted for 33.1% of the total variance and consisted of the six performance-approach goal items. The second factor accounted for 18.2% of the total variance and comprised the six mastery goal items. Factor 3 accounted for 12.0% of the total variance and comprised the six performance-avoidance goal items. Together, the three factors accounted for 63.3% of the total variance. I performed another principal-components factor analysis to examine the validity of the scales. Results showed that the factor solution accounted for 57.43% of the total variance and that 29.20% of the total variance was accounted for by the factor of mastery goal. The factors of performance-approach and performance-avoidance goals accounted for 17.10% and 11.13% of the total variance, respectively.

Cognitive/metacognitive study strategies and intrinsic value. I measured children's use of cognitive and metacognitive strategies, as well as their intrinsic interest in course work, by using the adaptation of Pintrich and De Groot's (1990) cognitive/metacognitive strategies and intrinsic value scales from the Motivated Strategies for Learning Questionnaire. According to Pintrich and his colleagues (Pintrich & De Groot, 1990; Pintrich et al., 1993), the scales of cognitive and metacognitive strategy use were constructed based on a general cognitive model of learning and information processing as well as the results of the factor analysis. Cognitive strategies include students' use of basic (i.e., rehearsal strategies) and complex strategies (i.e., elaboration and organizational strategies) to process information from texts and lectures. Metacognitive strategies involve strategies that help students control and regulate their own cognition such as planning, comprehension monitoring, and regulating. As stated previously, I administered a revised version for use with Taiwanese children (Wu & Cherng, 1992). To test the criterion-related validity...
Table 1. Information about Achievement Goals Scales, Cognitive/Metacognitive Strategies Scales, Intrinsic Value Scale, and Self-Handicapping Scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>No. of Items</th>
<th>Cronbach’s α</th>
<th>What Assessed</th>
<th>Sample Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery goals</td>
<td>6</td>
<td>.83</td>
<td>Orientation to develop competence or attain task mastery</td>
<td>I want to learn as much as possible from this class. I desire to completely master the material presented in this class. My goal in this class is to get a better grade than most of the students.</td>
</tr>
<tr>
<td>Performance-approach goals</td>
<td>6</td>
<td>.87</td>
<td>Orientation to demonstrate ability</td>
<td>It is important to me to do better than the other students. My goal in this class is to get a better grade than most of the students.</td>
</tr>
<tr>
<td>Performance-avoidance goals</td>
<td>6</td>
<td>.73</td>
<td>Orientation to avoid the demonstration of incompetence</td>
<td>I worry about the possibility of getting a bad grade in this class. I often think to myself, “What if I do badly in this class?”</td>
</tr>
<tr>
<td>Cognitive strategy use</td>
<td>12</td>
<td>.86</td>
<td>Use of elaboration and rehearsal strategies</td>
<td>When studying, I copy my notes over to help me remember material.</td>
</tr>
<tr>
<td>Metacognitive strategy use</td>
<td>9</td>
<td>.74</td>
<td>Planning, monitoring comprehension, and regulating cognition</td>
<td>I outline the chapters in my book to help me study. When I’m reading I stop once in a while and go over what I have read.</td>
</tr>
<tr>
<td>Intrinsic value for learning</td>
<td>8</td>
<td>.79</td>
<td>Interest in as well as perceived importance of course work</td>
<td>I ask myself questions to make sure I know the material I have been studying. I like what I am learning in this class.</td>
</tr>
<tr>
<td>Self-handicapping</td>
<td>6</td>
<td>.80</td>
<td>Use of a priori strategies to influence self-presentation</td>
<td>Some students purposely don’t try hard in school so that if they don’t do well they can say it is because they didn’t try. How true is this of you? Some students fool around the night before a test so that if they don’t do well they can say that is the reason. How true is this of you?</td>
</tr>
</tbody>
</table>

of these scales, students’ performance on the verbal achievement test was employed as the criterion. Results of the analysis suggested that each scale was correlated with the criterion. Specifically, the scales of cognitive and metacognitive strategy use were positively related to the achievement test ($r = .19, p < .01$ and $r = .21, p < .01$, respectively). Children’s reported intrinsic value for learning was also positively associated with the criterion ($r = .23, p < .01$). Such tests supported the validity of these scales.

Self-handicapping. Children’s use of self-handicapping strategies was assessed using a six-item scale (Urdan et al., 1998). These items were constructed to measure the extent to which students employ a priori strategies to influence self-presentation. Therefore, a phrase such as “they can say that is the reason” or “they can say it is because” was included in each item. Rather than assessing cognitions, this scale measures students’ use of active strategies and behaviors. Factor analysis performed by Midgley et al. (1996) yielded a single factor accounting for 59% of the total variance. The principal-components factor analysis I conducted also extracted a single factor accounting for
51.06% of the total variance, with loadings from .63 to .75.

Grades. I obtained students’ semester grades from student records at the end of the semester as a measure of academic achievement. The grading system in Taiwan for all classrooms assigned points (on a 100-point scale) on classroom tasks. Scores in different subjects (e.g., math, language arts) were averaged to represent the overall final semester grades. Before data analysis, collected scores were standardized (converted into T scores) within each classroom to help account for variations in teachers’ grading policies.

Results
The data were analyzed according to the following plan. To begin, I computed Pearson correlations to examine relations among key variables (achievement goal orientations, intrinsic motivation, self-handicapping, cognitive and metacognitive strategy use, and grades). Next, I conducted multivariate analyses of covariance (MANCOVAs) to determine the effects of combining two types of goals while controlling for the effects of a third type of goal on students’ motivational processes, cognitive engagement, and grades. Finally, because I found gender differences in children’s use of self-handicapping strategies in a preliminary analysis, I conducted a hierarchical multiple-regression analysis to explore multivariate relations among gender, achievement goals, grades, and self-handicapping.

Correlation Analyses
Descriptive statistics and correlation coefficients are presented in Table 2. Mastery goals were related positively to performance-approach goals \(r = .52, p < .01\). As expected, the two components of performance goals (i.e., performance-approach and performance-avoidance goals) were positively associated with each other \(r = .54, p < .01\). Intriguingly, mastery goals were correlated positively with performance-avoidance goals \(r = .24, p < .01\). This positive correlation was unexpected in terms of the revised goal theory. Due to the significant correlation between mastery and performance-approach goals, I speculated that the shared variance between the two components of performance goals may have played a role here (Middleton & Midgley, 1997). To investigate the relation between mastery and performance-avoidance goals, I used the partial correlation procedure. After controlling for the effects of performance-approach goals, I found that mastery goals were unrelated to performance-avoidance goals \(r = -.06, p > .01\).

As to the relations between achievement goals and other variables of interest, both mastery and performance-approach goals were positively related to reported intrinsic motivation, cognitive and metacognitive strategy use, and grades. There were no significant correlations between performance-avoidance goals and these variables. Further, children’s self-handicapping was related negatively to intrinsic motivation, effective strategy use, and grades, indicating the negative role of self-handicapping in students’ motivation, cognitive engagement, and grades.

Differences in the Effects of Combining Mastery and Performance-Approach Goals
As Table 2 shows, the motivational, cognitive, and achievement variables were correlated with one another and thus were used as dependent variables in the MANCOVA to explore whether students with different goal profiles varied on these outcome measures. To examine the combined effects of mastery and performance-approach goals, performance-avoidance goals were included as a covariate, and for the examination involving the performance-approach/performance-avoidance groups, I included mastery goals as a covariate. I used MANCOVAs in the hope that, by including these covariates, the combined effects of two types of goals could be determined while the effects of the other type of goal were controlled. To
test for interactions, I used the median-splits method on the three achievement goal measures to form three low/high categorical variables. These variables then served as independent variables in the MANCOVAs. I used median splits because this method allows the use of MANCOVA with multiple dependent variables. In contrast, regression analyses can use only one dependent variable at a time (Pintrich, 2000a). Because the primary purpose of this study was to examine effects of different goal profiles on a number of achievement-related outcomes, the median-splits procedure was appropriate. Table 3 displays the observed means, adjusted means, and the standard deviations of the dependent variables according to the different goal profiles.

Before I computed MANCOVA, I performed a preliminary ANOVA to compare students at the three elementary schools on each of the eight variables in Table 2. Using the Bonferroni method to correct for inflated probability levels associated with significance when conducting multiple tests (familywise $\alpha = .05$), I found no significant difference among students at the three schools. Additionally, $t$ tests were performed to determine gender differences in the same variables. I used the Bonferroni method when making comparisons. Results of $t$ tests suggested that boys ($M = 1.67$) differed significantly from girls ($M = 1.43$) in self-handicapping, $t(240) = 3.03, p < .01$. However, preliminary MANCOVAs yielded no significant main effects of gender or interacting effects for gender and achievement goals on the dependent variables. Consequently, I did not include gender as an independent factor in subsequent analyses.

Two assumptions for the MANCOVA had been examined before the analysis was performed. Because cell sizes for the independent variables were unequal, I conducted Box’s $M$ test first to check for homogeneity of variance-covariance matrices. The result of this test was not significant ($F = 1.48, p > .05$), indicating the confirmation of this assumption. Moreover, the test for homogeneity of regression also yielded insignificant results. Hence, using a common regression coefficient to adjust for the covariate in all groups was appropriate (Tabachnick & Fidell, 1996).

When I controlled for performance-avoidance goals, the MANCOVA revealed significant main effects for mastery goals, Wilks’s $\lambda = .71$, $F(5, 233) = 18.79, p < .001$. The effect size was calculated by means of an eta-squared value ($\eta^2$), which represented the proportion of variance of the dependent variables that was attributable to the effect (Tabachnick & Fidell, 1996). The eta-squared value for the effects of mastery goals was .29. The univariate analyses of the main effects of mastery goals were significant for intrinsic motivation, $F(1, 237) = 79.15, p < .001, \eta^2 = .25$; self-handicapping, $F(1, 237) = 4.51, p < .05, \eta^2 = .02$; cognitive strategies, $F(1, 237) = 61.67, p < .001, \eta^2 = .21$; metacognitive strategies, $F(1, 237) = 50.58, p < .001, \eta^2 = .18$; and grades,

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**Table 2. Descriptive Statistics and Correlations for Study Variables (N = 242)**

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tr>
<td>Mastery</td>
<td>3.69</td>
<td>.90</td>
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<tr>
<td>Performance-approach</td>
<td>3.21</td>
<td>1.06</td>
<td>.52**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Performance-avoidance</td>
<td>2.94</td>
<td>.88</td>
<td>.24**</td>
<td>.54**</td>
<td></td>
<td></td>
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<tr>
<td>Intrinsic motivation</td>
<td>3.50</td>
<td>.73</td>
<td>.70**</td>
<td>.32**</td>
<td>.12</td>
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<tr>
<td>Self-handicapping</td>
<td>1.55</td>
<td>.62</td>
<td>-.15**</td>
<td>-.07</td>
<td>.15*</td>
<td>-.21**</td>
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<tr>
<td>Cognitive strategies</td>
<td>3.28</td>
<td>.77</td>
<td>.68**</td>
<td>.41**</td>
<td>.14*</td>
<td>.68**</td>
<td>-.25**</td>
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<tr>
<td>Metacognitive strategies</td>
<td>3.23</td>
<td>.68</td>
<td>.62**</td>
<td>.30**</td>
<td>.05</td>
<td>.59**</td>
<td>-.25**</td>
<td>.78**</td>
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<tr>
<td>Grade</td>
<td>87.61</td>
<td>11.50</td>
<td>.28**</td>
<td>.21**</td>
<td>-.06</td>
<td>.28**</td>
<td>-.33**</td>
<td>.31**</td>
<td>.27**</td>
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* $p < .05$.  
** $p < .01$. 

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

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<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>HMHAP (n = 85)</th>
<th>HMLAP (n = 39)</th>
<th>LMHAP (n = 32)</th>
<th>LMLAP (n = 86)</th>
<th>HAPHAV (n = 79)</th>
<th>HAPLAV (n = 38)</th>
<th>LAPHAV (n = 26)</th>
<th>LAPLAV (n = 99)</th>
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<tr>
<td></td>
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<td>SD</td>
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<td>.63</td>
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<td></td>
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<tr>
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<td></td>
<td>(89.79)</td>
<td></td>
<td>(82.68)</td>
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</table>

Note.—Means in parentheses are adjusted for the covariates. HMHAP = high mastery/high performance-approach; HMLAP = high mastery/low performance-approach; LMHAP = low mastery/high performance-approach; LMLAP = low mastery/low performance-approach; HAPHAV = high performance-approach/high performance-avoidance; HAPLAV = high performance-approach/low performance-avoidance; LAPHAV = low performance-approach/low performance-avoidance; LAPLAV = low performance-approach/high performance-avoidance.
GOAL PERSPECTIVE

\[ f(1, 237) = 7.17, p < .01, \eta^2 = .03. \]

A post hoc Scheffé analysis showed that, in terms of motivational processes, students in both high mastery/high performance-approach (adjusted \( M = 3.89 \)) and high mastery/low performance-approach (adjusted \( M = 3.91 \)) groups reported significantly higher intrinsic motivation than did students in the low mastery/high performance-approach (adjusted \( M = 3.24 \)) and low mastery/low performance-approach (adjusted \( M = 3.03 \)) groups. In addition, students in the high mastery/high performance-approach group (adjusted \( M = 1.43 \)) and high mastery/low performance-approach group (adjusted \( M = 1.45 \)) reported engaging in less self-handicapping than did students in the low mastery/low performance-approach group (adjusted \( M = 1.74 \)).

In regard to the cognitive components, students high in mastery orientation (i.e., those in both high mastery/high performance-approach and high mastery/low performance-approach groups) reported significantly greater use of cognitive (adjusted \( Ms = 3.71 \) and 3.64, respectively) as well as metacognitive strategies (adjusted \( Ms = 3.56 \) and 3.52, respectively) than did students in the low mastery/high performance-approach group (adjusted \( M = 3.15 \) for cognitive strategies and 3.00 for metacognitive strategies) and low mastery/low performance-approach group (adjusted \( M = 2.75 \) for cognitive strategies and 2.86 for metacognitive strategies). As for academic achievement, children in the high mastery/high performance-approach (adjusted \( M = 90.52 \)) and high mastery/low performance-approach (adjusted \( M = 90.34 \)) groups got higher grades than did children in the low mastery/low performance-approach group (adjusted \( M = 83.20 \)).

Whereas the main effects for performance-approach goals did not reach significance at the multivariate level, the univariate tests were significant for cognitive strategies, \[ F(1, 237) = 5.18, p < .05, \eta^2 = .02. \] and grades, \[ F(1, 237) = 4.34, p < .05, \eta^2 = .02. \] Children who scored higher on the performance-approach orientation reported more use of cognitive strategies and had better grades than did those who were less performance-approach oriented. Moreover, the univariate test showed significant effects for the covariate of performance-avoidance goals on self-handicapping, \[ F(1, 237) = 6.08, p < .03, \eta^2 = .03. \] Students who obtained higher scores on performance-avoidance orientation were more likely to use self-handicapping strategies than were children low in performance-avoidance orientation. Also, there were significant interaction effects for the mastery and performance-approach goals on students' grades at the univariate level, \[ F(1, 237) = 4.87, p < .05, \eta^2 = .02. \] The test of simple main effects showed a significant difference between students high in performance-approach orientation (adjusted \( M = 89.79 \)) and students who were less performance-approach oriented (adjusted \( M = 82.68 \)) within the low-mastery group.

**Differences in the Combined Effects of Performance-Approach and Performance-Avoidance Goals**

This set of analyses concerned how students' academic functioning and performance varied with the combinations of different levels of performance-approach and performance-avoidance goals. To examine the pure effects of both components of performance goals, I used MANCOVA with mastery goal as a covariate. I checked the assumptions regarding homogeneity of variance-covariance matrices as well as homogeneity of regression before proceeding with the analyses. Results of the tests were not significant, indicating that these assumptions were met.

The MANCOVA showed significant effects for the covariate of mastery goals, Wilks's \( \lambda = .71, F(5, 233) = 19.30, p < .001, \eta^2 = .29. \) The univariate tests indicated significant effects on intrinsic motivation, \[ F(1, 237) = 80.81, p < .001, \eta^2 = .25; \] self-handicapping, \[ F(1, 237) = 4.84, p < .05, \eta^2 = .02; \] cognitive strategies, \[ F(1, 237) = \]
63.94, p < .001, η² = .21; metacognitive strategies, F(1, 237) = 51.59, p < .001, η² = .18; and grades, F(1, 237) = 7.96, p < .01, η² = .03. Students who scored higher on mastery orientation reported higher intrinsic motivation, greater use of cognitive and metacognitive strategies, less self-handicapping, and had higher grades than did students low in mastery orientation.

Although there were no main effects of the two components of performance goals at the multivariate level, results of the univariate tests demonstrated significant effects of performance-avoidance goals on self-handicapping, F(1, 237) = 5.52, p < .02, η² = .02. Significant interacting effects for the two types of performance goals on cognitive strategies were also found at the univariate level, F(1, 237) = 6.36, p < .02, η² = .03. Results of the test of simple main effects revealed that, within the low performance-avoidance group, children espousing performance-approach goals reported significantly greater use of cognitive strategies (adjusted M = 3.30) than did children low in performance-approach orientation (adjusted M = 3.14). In spite of these findings concerning the effects of performance goals, results of this set of analyses suggested that, all in all, students' achievement-relevant processes as well as their grades varied primarily according to their level of mastery goal orientation rather than different combinations of performance-approach and performance-avoidance goals. Table 4 summarizes the results of the MANCOVAs.

Regression Analysis

Because girls reported engaging in less self-handicapping than did boys, it seemed informative to explore the multivariate relations among gender, achievement goal orientations, grades, and self-handicapping. To do this, I performed a hierarchical multiple-regression analysis. In the first step of the analysis, gender was entered and emerged as a significant predictor of self-handicapping (β = .19, p < .01). I added mastery, performance-approach, and performance-avoidance goals to the model in the second step. Mastery goals negatively predicted handicapping (β = -.21, p < .01) when other predictors were controlled for in the regression model. Performance-avoidance goals positively predicted children's use of self-handicapping strategies (β = .19, p < .05), whereas performance-approach goals were not a significant predictor. In the final step, performance alone was entered and accounted for an additional 7% of the variance in handicapping. Students' grades negatively predicted handicapping (β = -.28, p < .001). In the final regression model, gender, mastery goals, and grades were significant predictors of handicapping. There were no significant interactions by gender. Table 5 shows the standardized regression coefficients and R² values associated with each step.

Discussion

The present study explores a more differentiated view of the role of achievement goals in Taiwanese children's motivation, strategy use, and academic performance. This study represents an initial investigation to compare the effects of performance-approach goals combined with mastery versus performance-avoidance goals in order to obtain a clearer picture of the differential pathways that different goal profiles may lead students to follow in the classroom. Overall, my findings best support the adaptiveness of mastery-based goals, a theory that has been maintained by a traditional achievement goal perspective developed in the Western cultures (Barron & Harackiewicz, 2001). Mastery goals are positively associated with Taiwanese children's motivation, cognitive engagement, and academic performance, regardless of their level of performance-approach orientation. Additionally, some results of the present research also fit the recently revised goal theory, for they provide empirical evidence to validate the theoretical distinction within performance goals (Harackiewicz, Barron, Pintrich, et al., 2002; Wolters, 2004). Performance-
Table 4. Summary of the Results of MANCOVAs (N = 242)

<table>
<thead>
<tr>
<th>Covariate (F Values)</th>
<th>Multivariate Analyses</th>
<th>Univariate Analyses (F Values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Motivation</td>
<td>Handicapping</td>
</tr>
<tr>
<td>Covariate (performance-avoidance goals)</td>
<td>.137</td>
<td>.00</td>
</tr>
<tr>
<td>Mastery goals</td>
<td>18.79***</td>
<td>79.15***</td>
</tr>
<tr>
<td>Performance-approach goals</td>
<td>1.84</td>
<td>1.03</td>
</tr>
<tr>
<td>Mastery X performance-approach</td>
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<td>1.80</td>
</tr>
<tr>
<td>Covariate (mastery goals)</td>
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<td>80.81***</td>
</tr>
<tr>
<td>Performance-approach goals</td>
<td>1.34</td>
<td>.47</td>
</tr>
<tr>
<td>Performance-avoidance goals</td>
<td>1.27</td>
<td>.04</td>
</tr>
<tr>
<td>Performance-approach X performance-avoid</td>
<td>1.45</td>
<td>2.30</td>
</tr>
</tbody>
</table>

* p < .05.
** p < .01.
*** p < .001.

Table 5. Hierarchical Regression Analysis Examining Predictors of Self-Handicapping (N = 242)

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Step 1 β</th>
<th>Step 2 β</th>
<th>Step 3 β</th>
</tr>
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<tr>
<td>Gender</td>
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<td>.21**</td>
<td>.20**</td>
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<tr>
<td>Step 2:</td>
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<tr>
<td>Mastery goals</td>
<td>-.21**</td>
<td>-.15*</td>
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<tr>
<td>Performance-approach goals</td>
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<td>.01</td>
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<tr>
<td>Performance-avoidance goals</td>
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<td>.13</td>
<td></td>
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<tr>
<td>Step 3:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grades</td>
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<td>-28***</td>
<td></td>
</tr>
<tr>
<td>Change in R²</td>
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<td>.07***</td>
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</tr>
<tr>
<td>Total adjusted R²</td>
<td>.04</td>
<td>.10</td>
<td>.17</td>
</tr>
</tbody>
</table>

Note.—Gender coded 0 = girl, 1 = boy.

* p < .05.
** p < .01.
*** p < .001.

Intrinsic Motivation

When the combined effects of mastery and performance-approach goals on Taiwanese children's intrinsic motivation were examined, students high in mastery orientation reported higher intrinsic interest than did their counterparts low in mastery orientation, regardless of their level of performance-approach goals. This finding replicates a host of previous studies revealing positive main effects of mastery goals on interest outcomes (e.g., Archer, 1994; Barron & Harackiewicz, 2001; Church, Elliot, & Gable, 2001; Elliot & Church, 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Harackiewicz, Barron, Tauer, & Elliot, 2002; Pintrich & Garcia, 1991). Mastery goals decrease social comparisons and enable students to use self-set standards. Positive feelings associated with making progress are likely to heighten the degree to which students value being competent and their in-

approach and performance-avoidance goals may lead to different consequences for motivation, cognition, and achievement. Specifically, performance-approach goals are adaptive in terms of children's use of cognitive strategies and grades, whereas performance-avoidance goals are related to students' maladaptive motivation, namely, self-handicapping. I discuss the results in terms of components of academic functioning examined in the study and their relation to achievement goals.
volvement in tasks. In turn, students are more likely to discover the enjoyable aspects of learning tasks, and intrinsic interest is thereby promoted.

In regard to effects of different goal profiles on intrinsic motivation, children who espoused goals of outperforming others and mastering new skills or knowledge at the same time appeared to follow the similarly adaptive trajectory of students who pursued mastery goals only. In other words, a performance-approach goal is not necessarily deleterious to a student's intrinsic interest as long as it is coupled with a mastery orientation. Nevertheless, when the adoption of performance-approach goals is not accompanied by a focus on mastery orientation, intrinsic motivation is likely to be reduced (Ames, 1992; Dweck & Legget, 1988). Students in the low mastery/high performance-approach group reported significantly lower intrinsic interest than did students in the high mastery/high performance-approach group. These findings are consistent with research showing that performance-approach goals seem unrelated to interest outcomes (e.g., Church et al., 2001; Elliot & Church, 1997; Midgley & Urdan, 2001; Urdan, 2004). Results of MANCOVA indicate that, regardless of performance-approach goals, children high in performance-avoidance orientation reported greater use of handicapping strategies than did children low in performance-avoidance orientation. Further, performance-approach goals had no significant effects on self-handicapping when the avoidance component of the performance goal was taken into consideration in the regression model. As other researchers have shown (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Ryan, Gheen, & Midgley, 1998; Skaalvik, 1997), I found that avoidance motives are associated with a range of negative outcomes. The fear of failure, in which performance-avoidance goals are grounded, motivates students to engage in handicapping for self-protection. However, performance-approach goals are at least not maladaptive under these circumstances (Harackiewicz et al., 1998; Harackiewicz, Barron, Pintrich, et al., 2002; Urdan, 1997).

Another noteworthy finding concerns the role of mastery goals in students' engagement in handicapping. Results of both MANCOVA and regression analysis reveal significant effects for this type of goal. In the analysis comparing groups of different goal profiles, students who were more mastery oriented reported less use of handicapping strategies than did students low in mastery orientation. Further, when additional controls such as other types of goals and students' grades were included in the regression model, the mastery goal remained a fairly robust negative predictor of self-handicapping. Because mastery goals focus students on understanding and mastery of the task, this orientation reduces the importance of self-perceptions and self-consciousness in achievement situations. Thus, students holding this type of goal may be less likely to engage in handicapping to protect self-image (Maehr & Kaplan, 2000).

Cognitive Strategy Use

On the basis of a general cognitive model of learning and information processing (Pintrich et al., 1993), children's cognitive engagement in the current study is rep-
resented by their use of cognitive and metacognitive strategies. As expected, Taiwanese children high in mastery orientation reported more frequent use of cognitive as well as metacognitive strategies than did children low in mastery orientation. The "strategic or self-regulated learning" hypothesis proposed by Linnenbrink and Pintrich (2000) suggests how a particular type of achievement goal may affect cognition. According to this hypothesis, because mastery goals lead students to concentrate on mastering and understanding the task, this type of goal should result in effective cognitive processing as well as more self-regulated learning. Similar to other studies (e.g., Bouffard et al., 1995; Pintrich, 2000b; Pintrich & Schrauben, 1992; Wolters, 2004), results of the current research apparently sustain this hypothesis.

As to the effects of performance-approach goals, the univariate tests were significant for cognitive strategies. Children high in performance-approach orientation reported greater use of cognitive strategies than did children low in performance-approach orientation. Additionally, I found significant interaction effects for performance-approach and performance-avoidance goals on cognitive strategies at the univariate level. Students low in performance-avoidance orientation who were more performance-approach oriented used cognitive strategies more frequently in comparison to children who were less performance-approach oriented. It appears that a high performance-approach orientation without an accompanying avoidance motive is associated with more use of cognitive strategies. As suggested earlier, the cognitive strategies assessed in the current study are supposed to facilitate effective processing of information. A focus on doing better than others is likely to orient students toward the use of these strategies, so that strategic processing of information from texts and lectures might result in better academic performance. These findings to some extent support the revised goal theory, which pos-

its that performance-approach goals may promote students' cognitive engagement in learning (Harackiewicz, Barron, Pintrich, et al., 2002; Wolters, 2004).

Academic Performance

The majority of researchers have not found a direct link between mastery goals and academic performance (Barron & Harackiewicz, 2001; Elliot & McGregor, 2001; Elliot et al., 1999; Harackiewicz et al., 1997, 2000; McWhaw & Abrami, 2001; Pintrich, 2000a; Skaalvik, 1997; Wolters, 2004), in spite of the ties with students' cognitive engagement. Nonetheless, in the present study mastery goals are positively related to children's grades. Regardless of their level of performance-approach goal, students high in mastery goal orientation had higher grades in comparison with other students. Because an association between mastery goals and achievement has not been found in most previous studies (Harackiewicz, Barron, Tauer, et al., 2002), future research using the method of structural equation modeling may illuminate my findings.

In terms of the effects of performance-approach goals, results of the present study are in line with established findings (Harackiewicz, Barron, Pintrich, et al., 2002; Wolters, 2004). Performance-approach goals have positive effects on children's achievement. Evidently, in the current study, mastery and performance-approach goals individually are positively related to students' grades. These findings are somewhat different from the now-familiar conclusion that only performance-approach goals are beneficial to an individual's performance (Wolters, 2004). In addition, I obtained significant interacting effects for mastery and performance-approach goals on students' grades. Children low in mastery goal orientation who were more performance-approach oriented performed better than did their counterparts who were less performance-approach oriented. On the basis of these findings, both the additive and interactive goal patterns Barron and Harackiew-
icz (2000, 2001) described can be identified in regard to the effects of pursuing multiple goals on Taiwanese students' academic performance.

A thorough investigation of the multiple goal patterns shown in the present study also reveals an additive goal pattern for Taiwanese children's use of cognitive strategies. Again, mastery and performance-approach goals are both positively associated with this outcome. Together, these identified patterns illustrate the advantage of multiple goal pursuit relative to single mastery goal pursuit (Harackiewicz, Barron, Pintrich, et al., 2002).

Implications for Classroom Practice

Results of my study corroborate the optimal effects of pursuing multiple goals on children's academic functioning and achievement. It appears that classroom practices emphasizing both understanding (mastery goals) and high normative achievement (performance-approach goals) should support students' cognitive engagement and academic performance. In contrast, this study points to the role of performance-avoidance goals in students' use of handicapping strategies. Whereas an emphasis on both mastery and performance goals at the classroom level may be positively related to adaptive achievement-relevant processes and outcomes (Midgley et al., 2001), students may engage in avoidance behaviors in a context characterized by the same goal structures when self-worth becomes an issue (Turner et al., 2003). Hence, it is important to consider the instructional practices that may mitigate circumstances that put students' self-worth on the line in classrooms perceived to be high in both mastery and performance-approach goals.

By examining the relations between classroom discourse and sixth graders' reported achievement behaviors in two high-mastery/ high-performance classrooms, Turner et al. (2003) found that teacher discourse indeed made a difference between classrooms with similar goal patterns. Clearly, students in classrooms with a high-mastery/high-performance goal structure may be sensitive to protecting self-worth and vulnerable to avoidance behaviors, such as handicapping, because of the strong achievement messages (Covington, 1992). Consistent with findings of the current study in respect to the negative relation of the mastery goal to self-handicapping, previous research (Turner et al., 2002, 2003) indicated that teachers' provision of mastery-oriented motivational support in classrooms with an emphasis on demonstrating ability may reduce the incidence of avoidance behaviors. Specifically, teachers may assure students of their increasing intellectual competence by responding to their progress and accomplishments. It is also crucial that the teacher explicitly convey to students that asking questions and making mistakes are a natural part of learning. If teachers can address students' fears of being incompetent through their instructional practices, students will be more likely to perceive the classroom environment as affirming. As a consequence, they may be less likely to feel their self-worth threatened, so that self-handicapping may be reduced (Billings & Moos, 1982; Covington, 1992).

In summary, in terms of implications for classroom practices, my findings parallel previous studies (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Turner et al., 2002, 2003) investigating the effects of teacher discourse on students' achievement outcomes and use of avoidance strategies through the lens of goal theory. Although an emphasis on both the development of ability (mastery goals) and the demonstration of ability (performance-approach goals) may lead to the benefits of multiple goal pursuit relative to single mastery goal pursuit, such multiple goal structures could bring forth the motivational hazards associated with avoidance behaviors. To address this problem, teachers create an environment in which students are free to take risks, make mistakes, and try again on their way to success without
concerns about their self-worth (Patrick et al., 2001).

Limitations and Future Research

Although the results of the present study provide insights into the cross-cultural validity of the achievement goal theory, a few limitations need to be addressed in future research. First, there is a need to explore more fully the interaction between the student’s personal goal orientation and the classroom goal structure. Even if the general Taiwanese educational context is predominantly performance oriented, some variations in classroom orientations likely exist. Depending on the extent to which personal and classroom goals are congruent, the moderator effect may be positive or negative (Harackiewicz et al., 1997, 1998; Newman, 1998). Such explorations could offer valuable insights into the effects of classroom practices on children’s adaptive learning behaviors.

Second, other personal characteristics may mediate relations between goals and outcomes. For example, Molden and Dweck (2000) contended that recent expansions of goal theory tended to overlook critical issues regarding the meaning of achievement goals. In light of this need, they proposed a framework through which meaning of goals can moderate the selection and implementation of achievement goals. This framework posits that individuals can hold different beliefs about the personal qualities being evaluated in achievement situations. Some students believe that performance tasks measure their fundamental and fixed intelligence, whereas others regard these tasks as examinations of more specific, acquirable skills. By considering the meaning system in which achievement goals are embedded, researchers may determine when a certain type of goal will be beneficial versus detrimental. Future research should examine how individuals’ systems of meaning may alter the way they perceive and pursue goals. The dynamics of achievement motivation cannot be fully captured without taking meaning into account (Molden & Dweck, 2000).

Third, my findings suggest the possibility that students can pursue multiple pathways to achieve similar outcomes. In other words, they may employ different types of strategies to regulate their cognition, motivation, and affect to attain their goals (Pintrich, 2000b). It is important that future research explore the ways in which different goal profiles lead to the development of self-regulation. In this case, researchers can use path analysis to clarify the underlying processes. As Harackiewicz, Barron, Pintrich, et al. (2002) pointed out, despite a challenging research agenda, the multiple goal perspective offers the potential for a more profound grasp of the complex interactions among motivation, cognition, and achievement.

Note

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