The study investigated whether self-regulation, self-efficacy, and metacognition can predict achievement goal orientations. There were 153 high school students and 183 college students who participated and surveyed using the self-regulation interview, self-efficacy questionnaire, metacognitive performance assessment, and a goal orientation measure. In the regression model, the high school (early adolescence) and college (late adolescence) students were moderated in the prediction of achievement goals. College students scored higher in all self-regulation subscales (p < .05). Mastery goal is significantly related to all self-regulation subscales and self-efficacy. The contribution of self-efficacy on performance orientation is significantly moderated by high school and college students. High school students with high self-efficacy increase their performance orientation. Self-efficacy, and self-regulation strategies such as self-consequencing, organizing, and environmental structuring are important characteristics of mastery-oriented students.

It is notable that Filipino young adolescents in their high school years perform differently compared to college students. This is not only brought about by differences in cognitive functioning due to age maturation but also to the kind of social environment the adolescent is in. The cognitive processes that adolescents use depend on the socialization process that they engage in. Such socialization process differs across the period between early and mid-adolescence because early adolescence is spent in high school while mid- and late-adolescence are spent in college.
According to Papalia, Olds, and Feldman (2004), adolescence is a stage where an individual goes through a developmental transition between childhood and adulthood entailing major physical, cognitive, and psychosocial changes. The Society for Research on Adolescence defines the stage as the second decade of life (Dornbusch, 2000) and ranges from age 11 until the late teens or early twenties. Authors of textbooks on developmental psychology subdivide the stage into early, middle, and late adolescence. More specifically, the sub-stages of late adolescence are identified from post secondary education (Wintre, North, & Sugar, 2000). Early and middle adolescents in a high school setting therefore have a different academic and social situation as compared to college students. For instance, early adolescence from 11 to 14 years poses opportunities for growth in cognitive and social competence, autonomy, and self-esteem. However, this period may be precarious too as some young adolescents may have difficulties in coping with many changes and may need help in dealing with these transitions.

The social learning theory of Bandura (1986) would explain that adolescent learners' cognition is influenced by the instigation, direction, and persistence of achievement-related behaviors. In the process of attaining these achievement behaviors, learning occurs from students' self-generated behaviors. These self-generated behaviors are framed in this study as self-regulation strategies (Zimmerman, 2000), metacognition (Flavell, 1987), and self-efficacy (Bandura, 1986).

The use of cognitive strategies such as self-regulation and metacognition is said to lead to specific achievement behaviors such as achievement goals (Elliot, 1998). The adolescent acquires achievement-related skills and strategies that are facilitated by age differences and specifically the context they are in (Dembo & Eaton, 2000). The factors self-regulation, metacognition, and self-efficacy are studied as they predict achievement goals. Age sublevels in adolescents are used to moderate the relationship between self-regulation, self-efficacy, and metacognition with achievement goals in order to demonstrate the influence of the context between high school and college.

There is a need to study these factors because previous research always couple self-regulation and metacognition with the outcome variable such as performance measured by achievement in model
building studies (Blakey & Spencer, 1990; Kluwe, 1982; Lopez, Little, Oettingen, Baltes, 1998; Magno, 2005; Rock, 2005). However, the achievement models in previous studies have not been differentiated age-wise using a cross-sectional design.

Previous studies usually show that achievement goals predict performance. Few studies use achievement goals as an outcome considering its nature as a prelude to performance. Zimmerman (2002) explains that when learners use self-monitoring strategies, it guides their goal-setting. In the present study, achievement goal orientation is used as an outcome variable of self-regulation, self-efficacy, and metacognition. Early investigations on self-regulation, self-efficacy, and metacognition showed that such variables are intercorrelated (Horn, Bruning, Schraw, Curry, & Katkanan, 1993; Joo, Bong, & Choi, 2000; Zimmerman & Martinez-Pons, 1988; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990) but these three variables have not been studied together to predict achievement goal as an outcome.

Thus, the present research investigated the combined effects of self-regulation, metacognition, and self-efficacy on the three factors of achievement goals (performance goal, performance avoidance and mastery goal). The aim of the study is to determine if self-regulation — when deconstructed into components — predict better achievement goals. Another aim is to determine the difference between high school and college adolescents on their use of cognitive strategies such as self-regulation, self-efficacy, and metacognition as they predict achievement goal orientation.

**Predictors of Achievement Goals**

The present study uses self-regulation, metacognition, and self-efficacy as predictors of achievement goals. The nature of these three factors indicates that they are precursors to achievement goals. Both self-regulation and metacognition are composed of strategies used in order to attain specific goals in learning (Ertmer & Newby, 1996; Ridley, Schultz, Glanz, & Weinstein, 1992; Schraw & Dennison, 1994; Winn & Snyder, 1998). On the other hand, high levels of self-efficacy are needed in order to become mastery-oriented (a component of achievement goal) on different tasks (Fiske & Taylor, 1991). There are numerous studies indicating that high levels of self-efficacy characterize individuals with mastery goals while low levels of self-efficacy characterize avoidant-
oriented individuals (i.e., Joo, Bong, & Choi, 2000; Shim & Ryan, 2005). The way individuals use strategies in learning can predict their kind of achievement goals.

**Self-Regulation.** Self-regulation is defined by Zimmerman (2002) as self-generated thoughts, feelings, and behaviors that are oriented to attaining goals. Self-regulation is not a mental ability or skill but rather a process where learners transform their mental abilities into academic skills. Zimmerman (2002) sees self-regulation as having a three-phase structure (forethought phase, performance phase, and self-reflection phase). When Zimmerman and Martinez-Pons (1986) established a measure of self-regulation, they arrived at 14 strategies that include self-evaluation, organizing and transforming, goal-setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequences, rehearsing and memorizing. Among these strategies, the basic component skills include: (1) setting specific proximal goals for oneself, (2) adopting powerful strategies for attaining the goals, (3) monitoring one's performance selectively for signs of progress, (4) restructuring one's physical and social context to make it compatible with one's goals, (5) managing one's time use efficiently, (6) self-evaluating one's methods, (7) attributing causation to results, and (8) adapting future methods. Students' levels of learning have been found to vary based on the presence or absence of these key self-regulatory processes (Schunk & Zimmerman, 1994; 1998).

The relationship between self-regulation and achievement goals was evidenced in one study by Sideridis (2006). He was able to confirm his hypothesis that feeling obliged to engage in an activity that is grounded on fear is associated with a network of avoidance-related behaviors. His results confirmed this hypothesis, as the ought-self explained significant amounts of variability in task avoidance, performance avoidance, and fear of failure. The study of Ablard and Lipschultz (1998) likewise demonstrated that self-regulation strategies in learning were used by students with high achievement adopting mastery goals. Students in the sample who were high achievers performing at or above the 97th percentile on an achievement test tend to have mastery goals rather than performance avoidance ones. Another study by Wolters (1998) revealed that college students possess various strategies that allow them to regulate their effort and persistence in accomplishing learning tasks in school. For instance, students who utilized
intrinsic regulation strategies reported stronger learning goal orientation as well as exhibit learning strategies associated with elaboration, critical thinking and metacognition. Such learning goal orientations and use of cognitive strategies were positively correlated with course grades. Self-regulated behavior has also been associated with the likelihood of other self-regulated processes as well as academic learning (Fuchs, Fuchs, Prentice, Burch, Hamlett, Owen, & Schroeter, 2003).

**Metacognition.** Metacognition is not simply a concept that covers planning and other cognitive processes. It is also said to be vital in understanding successful performance. Metacognition enables learners to adjust consequently to changeable problem solving tasks, demands and contexts (Dosoete, Roeyers, & Buysse, 2001). It also has an established connection with achievement performance of students, as evidenced in many studies (Blakey, 1990; Kluwe, 1982; Magno, 2005; Lopez, Little, Oettingen, & Baltes, 1998; Rock, 2005; Schneider, 1985). Students who use metacognitive strategies are more successful. For instance, in a study by Ford, Smith, Weissbein, Gully, and Salas (1998), students who monitored their learning by means of identifying where they experienced difficulties and adjusting their behaviors accordingly acquired greater knowledge, confidence and better performance strategies in completing their learning tasks. Individuals identified with higher mastery orientation also exhibited greater metacognitive activity during learning. In a similar light, Wolters (2004) conducted a study where junior high school students (N = 525) completed a self-report survey that assessed their perceived classroom goal structures together with metacognitive learning. The results indicate that metacognition predicts performance orientation and mastery orientation. Rock (2005) used an even more specific metacognitive skill — strategic self-monitoring — and investigated its effect on academic engagement, non-targeted problem behavior, productivity, and accuracy of students. The results indicated that the use of this specific metacognitive strategy decreased students’ disengagement on a task and academic productivity and accuracy improved. Individuals who use metacognitive strategies do seem far from being avoidant in their learning. Furthermore, metacognition can also predict achievement goals (Elliot, McGregor, & Gable, 1999).

**Self-efficacy.** Individuals have a sense of confidence regarding performance of specific tasks or self-efficacy for learning. Self-
efficacy can be influenced by factors such as student abilities, prior experiences and attitudes toward learning, as well as by instructional and social factors (Bandura, 1977, 1986, 1997; Chu, 2001; Cintura, Okol, & Ong, 2001; Jinks & Morgan, 1999; Narciss, 2004; Schunk & Cox, 1986).

Self-efficacy, according to Bandura (1997), is the belief in one’s capabilities to organize and execute courses of action required to produce given attainments. Self-efficacy has a well-established link with other factors such as metacognition and self-regulation but needs to be explored in terms of its connection to achievement goal orientation. There is some evidence that self-efficacy is related to achievement goals. In a correlational study by Pintrich and DeGroot (1990), a positive relationship was established between self-efficacy and students’ cognitive engagement and performance. Students who displayed belief in their own capabilities reported use of cognitive strategies, engagement in self-regulation and persistence in difficult or uninteresting academic tasks, which resulted in better academic performance. Similar findings were found in the study of Phillips and Gully (1997), where students’ self-efficacy was found to positively relate to self-set goals and higher performance. Bong (2004) assessed academic self-efficacy, task value, ability, effort attributions with mastery, performance-approach, and performance-avoidance achievement-goal orientations in reference to English, Korean, mathematics, and general school learning among 389 Korean high school girls. On average, attributional beliefs appeared least “generalizable,” across subject areas followed by task value and mastery achievement-goal orientations. Academic self-efficacy beliefs were correlated moderately, whereas performance-approach and performance-avoidance achievement-goal orientations were strongly correlated across different contexts. Motivational beliefs in each of the specific school subjects were more strongly correlated with motivational beliefs in general school learning than with beliefs in other areas of subject matter.

Another study by Shim and Ryan (2005) also investigated the relationship between achievement goals and changes in students’ self-efficacy and other factors in response to grades in a short-term longitudinal study of 361 college students. Data were collected at the beginning of the semester and immediately after students received their grades on their first major exam or paper. They found that a mastery goal was associated with enhanced self-
efficacy and a performance-avoidance goal was associated with diminished self-efficacy around the receipt of grades. A performance-approach goal was associated with diminished self-efficacy when students received low grades but not high grades. These studies (Bong, 2004; Shim & Ryan, 2005) show a relationship between self-efficacy and achievement goals although not a very explicit one. Finally, Hsieh, Sullivan, and Guerra (2007) conducted a study on self-efficacy and goal orientation among college students who are of good academic standing and those who are on probation. Results showed that self-efficacy was related to student's adoption of mastery goals, where students were able to display value for their efforts, persist despite difficulty and engage in school-related tasks. Self-efficacy was also reflected in high achievement as demonstrated by successful college performance and graduation. Compared to their counterparts, students with good academic standing have higher self-efficacy and in turn, do not adopt performance avoidance goals.

Achievement Goal Orientation

Goal orientation is emerging as a useful construct for understanding how people develop, attain or demonstrate competence in learning and performance. It is generally accepted that goal orientation comprises three factors — mastery goal, performance goal, and performance-avoidance orientations (Elliot & Church, 1997). Achievement goal orientation represents a motivational variable that describes the broad goals held by people when facing a learning or performance task (Fisher & Ford, 1998). Achievement goals are schemas or cognitive frameworks that encompass beliefs about purpose, competence, and success that influence students' approach to, engagement in, and evaluation of performance in school (Dweck & Leggett, 1988). Although Dweck (1986) conceptualized dispositional goal orientation as bipolar and unidimensional, others have claimed that goal orientation is best understood as a two-dimensional variable. For instance, dispositional goal orientation could be viewed as a stable trait that assumes one of two forms: 1) a learning orientation (mastery goal) in which the focus is on increasing competence; and 2) a performance orientation in which demonstrating competence by meeting normative-based standards is critical (Colquitt & Simmering, 1998).

A mastery goal concerns a focus on developing competence and gaining understanding or mastery. In contrast, a performance goal
concerns a focus on demonstrating competence. Performance goals can be distinguished as either approach or avoidant (Elliot & Church, 1997). A performance-approach goal concerns a focus on gaining favorable judgments of one’s ability, and a performance-avoidance goal concerns a focus on avoiding negative judgments of one’s ability. Achievement goals represent disparate purposes for involvement regarding academic tasks and, as such, have been linked to different achievement-related processes and outcomes.

The selective goal pattern states that individuals may pursue different goals in different situations (Barron & Harackiewicz, 2003). This means that individuals’ achievement goals may vary according to identified specific contexts. In the present study the context is operationalized by comparing high school and college students in the prediction of their goal orientations.

The studies where self-regulation, metacognition, and self-efficacy are related to achievement goals show that all these factors were studied separately (Ablard, Karen, Lipschultz, & Rachelle, 1998; Bong, 2004; Elliot, McGregor, & Gable, 1999; Shim & Ryan, 2005; Sideridis, 2006; Rock, 2005; Wolters, 2004). Some studies only showed their relationships without predicting achievement goals. The aim of the present study is to determine which factor among self-regulation, metacognition, and self-efficacy best predicts achievement goals. The prediction is buttressed by the social cognitive theory (Fiske & Taylor, 1991) wherein individuals are said to make use of learning strategies, e.g., self-regulation and metacognition, in order to gain resources to perform well. In the present study, achievement goals with the factors of mastery, performance, and avoidance are used as the outcome of such learning strategies. The social cognitive theory focuses on how people make sense of the actions of other people and themselves (Fiske & Taylor, 1991). Students enter activities with goals and they differ on how efficacious they feel about attaining these goals. The sense of efficacy and strategies used are considered before goals to learning are attained. It is hypothesized in the study that the use of self-regulation, metacognition, and self-efficacy will strongly predict mastery over performance approaches and negatively predict avoidant approaches.
Cognition during Adolescence

There is a marked cognitive development from early to late adolescence due to brain growth (Blakemore & Suprana, 2006). Changes in executive functions and social cognition therefore occur during puberty (early) and late adolescence. Given the process of psychological maturity, academic performance also varies across age groups in the adolescent stage. The report of the Carnegie Council on Adolescent Development (1989) indicates the academic and nonacademic outcomes during this developmental period is due to “young adolescents facing significant turning points... for many youth 10 to 15 years old, early adolescence offers opportunities to choose a path toward a productive and fulfilling life... for many others, it represents their last best chance to avoid a diminished future” (p. 8). One of the major issues in the education of young adolescents pertains to the middle-grades school transition. For many individuals, this transition represents the beginning of a general deterioration in academic performance, motivation, self-perceptions of ability, and relationships with peers and teachers (Eccles & Midgley, 1989).

The future for many adolescents is bleak unless educational reforms influence their motivation and academic achievement. Dembo and Eaton (2000) stressed the importance of integrating self-regulation strategies to improve student learning especially in middle school and high school.

Due to the marked changes from early to late adolescence brought about by contextual differences in schooling and cognitive development, the present study determines the difference of the two age groups on their self-regulation, metacognition, self-efficacy, and achievement goals. The study further tested whether the prediction of achievement goals is moderated by early and late adolescent age groups. It is hypothesized that the moderation will show differences in the pattern of self-regulation, metacognition, and self-efficacy in predicting achievement goals across high school (early adolescence) and college (late adolescence) students.
Method

Research Design

The study utilized a cross-sectional research design where two different age groups composed of high school and college adolescents were studied at the same point in time. These two age groups (high school and college) were compared on measures of self-regulation, self-efficacy, metacognition, and achievement goal orientations.

Participants

There were 336 participants ranging from 14 to 21 years old who are currently studying in three high schools (n =153, mean age =14.3 years) and two colleges (n =183, mean age =19.0 years). The high school participants' ages range from 14 to 16 years while the college participants' ages range from 17 to 21 years. The participants were selected through purposive sampling. The selection criteria were matched for both high school and college samples where both are: (1) attending a private exclusive school in the National Capital Region; (2) 85 to 95 average grades (equivalent grades were taken for the college sample); and (3) similar honor and non-honor student ratio. The majority of high schools where the questionnaires were administered have a high percentage of graduates studying in the selected colleges of the study. These criteria were used to ensure the equivalence in the characteristics of both the high school and college samples.

Measures

Self-Regulated Learning Interview Schedule (SRLIS). The instrument was constructed by Zimmerman and Martinez-Pons (1986) and has eight open-ended questions. Each participant rated their answers to the questions in terms of how frequently they used the strategy. The interview measures eight self-regulation strategies that include self-evaluation, organizing and transforming, goal-setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequences, and rehearsing and memorizing. Six different learning contexts were described to each student: in classroom situations, when studying at home, when completing writing assignments, when completing mathematics assignments, when
preparing for and taking tests, and when poorly motivated to complete homework. The measure has undergone construct validation specifically convergent validity of the SRLIS scale and standardized measures of students' achievement. Principal-components analysis was performed followed by an oblique factor rotation. The correlation between rotated Factors I and II was .57; between rotated Factors I and III, it was .43; and between rotated Factors II and III, it was .36.

**Academic Self-efficacy.** The self-efficacy scale, constructed by Chemers, Hu, and Garcia (2001), was composed of eight items with a 7-point Likert scale where respondents agreed with statements reflecting confidence in their ability to perform well academically. The internal consistency of the items has an alpha coefficient of .81 in Chemers, Hu and Garcia (2001). The internal consistency of the eight items in the present study using Cronbach's alpha is .93.

**Metacognitive Performance Assessment (MPA).** The MPA was constructed by Magno (2005) to measure a domain specific metacognition in the context of mathematics problem solving. The items measure specific metacognitive skills that include declarative knowledge, conditional knowledge, procedural knowledge, prediction, planning, evaluation of learning, and monitoring. Cronbach's alpha is .39 which indicates moderate consistency of the items. The internal consistency of the scale was recomputed using the data on the present study and a Cronbach's alpha of .49 was obtained. Parallel forms reliability was conducted where the total scores of the metacognitive performance assessment and the metacognitive skills by Panaoura and Philippou yielded a correlation coefficient of $r = .71$. Confirmatory Factor Analysis (CFA) was conducted where all the factors were significant components of the construct metacognition. The unstandardized parameter estimates for the CFA for each dimension are 2419.55, 308.74, 299.88, 1913.22, 1701.68, 1884.40, and 1476.87, respectively.

**Goal Orientation.** A Goal orientation measure created by Zweig and Webster (2004) was used. The scale draws on learning and performance orientation items from the general goal orientation scale created by Button et al. (1996), adapting performance avoidance orientation items from the situation-specific goal orientation scale created by Elliot and Church (1997). It measures
three areas on achievement goal orientation that includes mastery goal, performance goal, and performance-avoidance goal. The resulting measure is comprised of 21 items, with three scales, each containing seven items. Internal consistency reliabilities for the three scales were: learning orientation ($\alpha = .85$), performance approach orientation ($\alpha = .82$), and performance avoidance orientation ($\alpha = .69$). Test-retest reliability coefficients for the goal orientation scale at Time 1 and Time 2 were as follows: learning orientation ($r = .73$), performance approach orientation ($r = .84$), performance avoidance orientation ($r = .78$). The test-retest reliabilities suggest that goal orientation is stable over time.

**Procedure**

Students from three different private high schools and two colleges in the metropolitan Manila area were requested to answer a series of questionnaires. Informed consent was obtained from the high school and college respondents who were willing to participate in the study. The respondents were monitored while answering the instruments in case questions would arise. After answering, the students were thanked and debriefed about the purpose of the study.

**Data Analysis**

The inventories for each respondent were scored by summating the scores of the items. For the self-regulation interview, separate scores were obtained for each use of strategy. For self-efficacy and metacognition, global unidimensional scores were obtained.

The mean scores of the high school and college samples on each scale were then compared using the t-test for two independent samples. The relationship of self-regulation, metacognition, and self-efficacy with the three factors of achievement goals were also established using Pearson r.

The Hierarchical Multiple Regression analysis with forward step was used to determine whether the components of self-regulation, self-efficacy, and metacognition significantly predict each scale of the achievement goals. The early and late adolescent groups were coded as categorical variables (high school = "1" and college = "2") that were used to moderate self-regulation, metacognition, and self-efficacy in predicting each of the three
achievement goals. In the regression model, the age group codes were also entered as predictors and were multiplied with the scores of the predictor factors. If the age group is significant, then the predictors increase achievement goals for one age group (see Frazier, Tix, & Barron, 2004).

Results

The data from the study were categorized for the high school and college samples and they were compared on the components of self-regulation, self-efficacy, metacognition, and the three achievement goal orientations: mastery goal, performance goal, and avoidance. In the first set of analysis as shown in Table 1, the means were compared for both samples using the t-test for two independent samples.

Table 1. Comparison of High School and College Samples

<table>
<thead>
<tr>
<th></th>
<th>High School</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Self-evaluation</td>
<td>4.22</td>
<td>1.49</td>
</tr>
<tr>
<td>Organizing</td>
<td>3.99</td>
<td>1.82</td>
</tr>
<tr>
<td>Goal setting</td>
<td>4.28</td>
<td>1.54</td>
</tr>
<tr>
<td>Seeking information</td>
<td>3.92</td>
<td>1.45</td>
</tr>
<tr>
<td>Keeping record</td>
<td>4.19</td>
<td>1.35</td>
</tr>
<tr>
<td>Environmental structuring</td>
<td>4.12</td>
<td>1.26</td>
</tr>
<tr>
<td>Self-consequencing</td>
<td>4.14</td>
<td>1.37</td>
</tr>
<tr>
<td>Rehearsing</td>
<td>4.21</td>
<td>1.47</td>
</tr>
<tr>
<td>Metacognition</td>
<td>18.9</td>
<td>5.18</td>
</tr>
<tr>
<td>Performance Approach</td>
<td>104.23</td>
<td>18.64</td>
</tr>
<tr>
<td>Performance Avoidance</td>
<td>33.09</td>
<td>6.41</td>
</tr>
<tr>
<td>Mastery Goal</td>
<td>39.25</td>
<td>6.36</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>33.39</td>
<td>10.46</td>
</tr>
</tbody>
</table>

Note. High school sample is early adolescence, college sample is late adolescence, df = 334

***p < .001

The two age groups significantly differ on all self-regulation subscales, self-efficacy, and performance approach (p < .001). The
college sample significantly scored higher in all self-regulation subscales than the high school sample. Self-efficacy and performance approach is significantly higher for the high school sample. There was no significant difference for mastery and avoidant goal orientations.

Zero order correlations were conducted for the high school and college samples to determine the relationship of the three achievement goal orientations to the factors of self-regulation, self-efficacy, and metacognition. Table 2 shows that performance approach is significantly correlated with all the subscales of the self-regulation as well as for self-efficacy and metacognition, $p < .05$. All subscales of self-regulation are negatively related with performance approach. Self-efficacy and metacognition increases with performance approach. For performance avoidance, only organizing and metacognition are significant. Metacognition is negatively related with performance avoidance. For mastery goal, all the self-regulation subscales and self-efficacy are significantly related with mastery goal with a positive magnitude, $p < .05$.

Table 2. Zero Order Correlations for the High School and College Samples

<table>
<thead>
<tr>
<th></th>
<th>Performance Approach</th>
<th>Performance Avoidance</th>
<th>Mastery Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-evaluation</td>
<td>-.24**</td>
<td>.07</td>
<td>.15**</td>
</tr>
<tr>
<td>Organizing</td>
<td>-.45**</td>
<td>.12**</td>
<td>.17**</td>
</tr>
<tr>
<td>Goal setting</td>
<td>-.28**</td>
<td>.11</td>
<td>.18**</td>
</tr>
<tr>
<td>Seeking information</td>
<td>-.32**</td>
<td>.02</td>
<td>.14**</td>
</tr>
<tr>
<td>Keeping record</td>
<td>-.30**</td>
<td>-.00</td>
<td>.16**</td>
</tr>
<tr>
<td>Environmental structuring</td>
<td>-.22**</td>
<td>.07</td>
<td>.21**</td>
</tr>
<tr>
<td>Self-consequencing</td>
<td>-.39**</td>
<td>.03</td>
<td>.21**</td>
</tr>
<tr>
<td>Rehearsing</td>
<td>-.40**</td>
<td>.04</td>
<td>.16**</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.37**</td>
<td>-.07</td>
<td>.12**</td>
</tr>
<tr>
<td>Metacognition</td>
<td>.11**</td>
<td>-.11**</td>
<td>-.03</td>
</tr>
</tbody>
</table>

Hierarchical Multiple Regression analysis with forward step (reported in Table 3) showed that in predicting performance approach, the level (high school and college), interaction of level and self-efficacy, self-efficacy, and organizing are the significant
predictors. The regression was a good fit (R^2 adj = 76.89%), but the overall relationship was significant as indicated by F (4, 325) = 270.4, p < .01. With the other factors held constant, performance goal is related with level, interaction of level and self-efficacy, self-efficacy and organizing, decreasing by 2.03, increased of 1.5, decrease of .90, and .15 for every extra point respectively. The effect of these predictors is found to be significant, p < .05.

Table 3. Hierarchical Regression Analysis for Variables Predicting Performance Approach

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R</th>
<th>ΔR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level (high school and college)</td>
<td>-2.03*</td>
<td>.11</td>
<td>-154.07</td>
<td>0.78</td>
<td>0.61</td>
</tr>
<tr>
<td>Self-efficacy X Level</td>
<td>1.50*</td>
<td>.12</td>
<td>3.37</td>
<td>0.83</td>
<td>0.08</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>-.90*</td>
<td>.09</td>
<td>-3.91</td>
<td>0.87</td>
<td>0.07</td>
</tr>
<tr>
<td>Organizing</td>
<td>-.15*</td>
<td>.03</td>
<td>-3.17</td>
<td>0.88</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*p < .05

Since the interaction of self-efficacy and level is found to be significant, this shows that high school students (decrease in level) with high self-efficacy decrease their performance approach. But college students with low self-efficacy increase their performance approach.

The most important predictor of performance orientation is level with a multiple correlation of R = .78**. The interaction of level and self-efficacy increases the combined effects to R = .83, the addition of self-efficacy in the model increases R to .87, and inclusion of organizing increases the R to .88.

Another hierarchical multiple regression model was conducted to predict performance avoidance using the same predictors (see Table 4). Here, organizing is the only sole predictor of performance avoidance. The regression was rather a poor fit (R^2 adj = 1.04%), but the overall relationship was significant as indicated by F (1,328) = 4.47, p < .01. With the other factors held constant, performance avoidance is related with organizing, increasing by 0.12 for every extra point using this self-regulation strategy. The effect of this predictor is found to be significant, t (328) = 2.11 with p < .05.
Table 4. Hierarchical Regression Analysis for variables Predicting Performance Avoidance

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizing</td>
<td>.12*</td>
<td>.05</td>
<td>.43</td>
</tr>
</tbody>
</table>

Note. R=.12, R²=.01  
*p<.05

For the next hierarchical regression model (Table 5), mastery goal was used as the criterion with the same predictors.

Table 5. Hierarchical Regression Analysis for Variables Predicting Mastery Goal

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R</th>
<th>ΔR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-consequencing</td>
<td>.13</td>
<td>.07</td>
<td>.58</td>
<td>0.21</td>
<td>0.04</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.34*</td>
<td>.06</td>
<td>.23</td>
<td>0.32</td>
<td>0.05</td>
</tr>
<tr>
<td>Organizing</td>
<td>.19*</td>
<td>.08</td>
<td>.64</td>
<td>0.35</td>
<td>0.02</td>
</tr>
<tr>
<td>Environmental structuring</td>
<td>.14*</td>
<td>.07</td>
<td>.70</td>
<td>0.37</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*p > .05

In predicting mastery goal, self-efficacy, organizing, and environmental structuring are the significant predictors. The regression was rather a poor fit (R² adj = 12.27%), but the overall relationship was significant as indicated by F (4, 325) = 12.50, p < .05. With the other factors held constant, mastery goal is related with self-efficacy, organizing, and environmental structuring, increasing by .34, .19, and .14 for every extra point respectively. The effect of these predictors is found to be significant, p < .05. The age level of the participants did not moderate the prediction of mastery goal.

When self-consequencing was entered as a predictor of mastery goal the overall multiple correlation produced is .21** which is significant. The inclusion of self-efficacy increases the R by .10, organizing increases R by .12, and environmental structuring increases R by .13.

Discussion

The results in this study showed how achievement-related behaviors such as self-regulation, self-efficacy, and metacognition
are related to achievement goal orientations that include avoidance orientations, performance, and mastery goal. The prediction of performance orientation was moderated between high school and college students but not for avoidance and mastery goals. The achievement goal orientation of high school and college students is stable for mastery and avoidant goals, but performance approach is higher for the high school sample. The prediction of mastery and avoidance were not moderated by level and were stable across the two levels. On the other hand, all self-regulation components are higher for the college students. But self-efficacy is lower for the college sample.

Thus, changes that occurred for achievement goals across early and late adolescents were observed. Mastery and avoidant goals remained consistent from early to late adolescence while performance orientation tended to change. This indicates that achievement goals such as mastery and avoidant goals are adopted for longer periods of time than performance orientation (Zweig & Webster, 2004). The stability of mastery and avoidance across early to late adolescence contributes to the social cognitive aspect of development.

In this study, self-regulation is adopted more by students with mastery orientation. Cognitive development also brings about more consistent cognitive control as reflected in the use of more self-regulation strategies (Blakemore, 2006; Flavell, 1992; Klune & Sweeney, 2004).

The adoption of greater self-regulation strategies in the college sample and the presence of more self-regulation predictors for mastery goal are explained in the change of school environment. Tertiary education presents various modes of learning that are not limited to the classroom set-up common in primary and secondary education. This follows Vygotsky’s theory that individuals change in a changing environment (Bjorklund, 2000). College is a big turning point for adolescents; now they can immerse themselves in a context that provides more autonomy to choose and make decisions for themselves, enabling them to use more cognitive strategies where success is better predicted (Eccles & Midgley, 1989).

Developmental changes in self-efficacy also predicted performance goals. Self-efficacy increases performance goals in high school but decreases performance goals in college. These
findings show that confidence in one's ability for a younger age group leads to the adoption of insufficient goals in learning. The higher self-efficacy exhibited by the high school sample is attributed to setting higher goals that are not achievable which then characterizes performance orientation. This shows that younger adolescents overestimate goals and lack the foresight to set achievable goals (see also Shanahan & Flaherty, 2001). Self-efficacy works better for college students. The college students' confidence in their own ability decreases the likelihood of adopting a performance orientation goal.

The inability of young adolescents to estimate achievable goals is brought along by their ineffective cognitive strategies (Carnegie Council on Adolescent Development, 1989). Academic and non-academic outcomes during the early adolescent period represent the beginning of a general deterioration in academic performance, motivation, self-perceptions of ability, and relationships with peers and teachers. In a developmental perspective, the stage of early adolescence is characterized by having a feel in last place when it comes to their position in the adolescents' pantheon of influence and admiration (Hamman & Hendricks, 2005). Furthermore, in early adolescence it is normal to appear unsettled because of the active exploring of possibilities for self-definition (Papalia, Feldman, & Olds, 2004). In the Philippine setting the underachievement of high school students may be evident in the results of the Third International Mathematics and Science Survey (1999) where the Philippines ranked second to the last. Considerable efforts are now being done in the other parts of the globe to raise students' achievement in high school as demonstrated in different studies (Leath, 1995; Bottoms & Faegin, 1997; Bottoms, 2000).
References


Authors' Note

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