

# Self-Regulation of Learning and Academic Delay of Gratification:

Gender and Ethnic Differences  
Among College Students

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**f**ew studies on the self-regulation of learning have examined individual differences such as gender and ethnicity among learners (Pintrich & Zusho, 2007; Ryan, Ryan, Arbuthnot, & Samuels, 2007; Schunk, Pintrich, & Meece, 2008) to determine whether gender and ethnic differences exist with respect to students' motivational beliefs, use of cognitive and learning strategies, and willingness to delay gratification. This lack of research suggests that educators may not be providing adequate instruction for students with diverse backgrounds (Long, Monoi, Harper, Knoblauch, & Murphy, 2007; Pintrich & Zusho, 2007; Schunk et al., 2008). Thus, the purpose of the present study was to examine how college students' motivational beliefs, use of cognitive and self-regulatory strategies, willingness to delay gratification, and academic performance varied as a function of their gender and ethnicity in a typical college course or classroom.

Self-regulated learners engage in self-generated thoughts, actions, and feelings while pursuing academic goals. The most successful learners use appropriate learning strategies and maintain high levels of motivation. Few studies on the self-regulation of learning have examined individual differences such as gender and ethnicity among college students. The study examined gender and ethnic differences in the relationships between academic performance, self-regulation, motivation, and delay of gratification using correlational analyses. The study also investigated whether students from diverse gender and ethnic groups differed with regard to their use of self-regulation, motivation, delay of gratification, and academic performance using multivariate and univariate analyses of variance. Participants were 364 college students enrolled in introductory psychology courses in a public university. The results suggested the presence of gender and ethnic differences in motivation, use of cognitive strategies, and delay of gratification, and use of self-regulation of learning is ambiguous. The reported self-efficacy beliefs of all groups of students were moderately to highly correlated with grades. The results also suggested that, independent of gender or ethnicity, the student's evaluation of the importance and usefulness of the course task was related to achievement in the class. There were differences in the relationships between delay of gratification and the use of cognitive strategies, between ethnicity and gender groups. In examining the mean differences of each group, there was a significant difference between course grades, with Caucasian students obtaining higher grades. In addition, minority males also reported significantly lower self-confidence in their ability to perform academic tasks.

## Summary

## Self-Regulation of Learning

Students' self-regulation of learning has been of continual concern for researchers and educators (Bandura, 1997; Chen & Zimmerman, 2007; Schunk & Zimmerman, 2006; Zimmerman & Kitsantas, 2005). Research has shown that to achieve academic excellence, learners must learn how to self-regulate their actions and maintain academic goals despite difficult academic tasks (Pintrich & Zusho, 2007; Schunk & Zimmerman, 2006). Skilled learners engage in self-generated thoughts, actions, and feelings while pursuing academic goals (Zimmerman, 2000). The most successful learners use appropriate learning strategies and maintain a high level of motivation (Bandura, 1997; Zimmerman, 2000).

Self-regulation during skill acquisition may explain individual differences among learners. In the classroom, some students exhibit adaptive self-regulatory strategies and motivational patterns while engaging in academic tasks, such as exerting appropriate effort for success, enjoying the challenge of the activity, using appropriate learning strategies, setting specific goals, and displaying a high self-efficacy level (Schunk et al., 2008). In contrast, other students cease exerting effort, lose interest in the activity, are unable to set specific goals and strategies, and have low self-efficacy (Schunk et al., 2008; Zusho, Karabenick, Rhee Bonney, & Sims, 2007). Students exhibiting the latter set of behavioral patterns rarely achieve high levels of academic success. The present study examined whether these patterns of behavior are associated with differences in the students' ethnicity and gender.

## Academic Delay of Gratification

This study integrated academic delay of gratification into the constellation of components for the self-regulation of learning. In the literature, this constellation of learning strategies has been associated with learning and academic achievement.

Recently, Bembenutty and Karabenick (1998, 2004) suggested that students strategically delay gratification by voluntarily postponing immediate gratification to enact academic rewards that are temporarily distant but highly valuable. The researchers posited that delay of gratification is a learning strategy similar to self-monitoring, effort regulation, and help-seeking. From this perspective, *academic delay of gratification* refers to students' willingness to forgo an immediately available option (e.g., go to a favorite concert the day before a test even though the student is not well-prepared) in favor a delayed alternative (e.g., stay home and study now to get a good grade in the course later) in order to secure temporarily distant academic rewards, goals, and intentions (Bembenutty, 1999).

Academic delay of gratification has been assessed by the Academic Delay of Gratification Scale (ADOGS; Bembenutty & Karabenick, 2004), which measures students' preferences for an immediately available attractive option versus a delayed alternative. An example is "Delay studying for an exam in this class the next day even though it may mean getting a lower grade, in order to attend a concert, play, or sporting event" versus "Stay home to study to increase your chances of getting a high grade on the exam." Students responded on a 4-point scale. The psychometric properties of ADOGS have been well established. For instance, several studies (Bembenutty, 1999; Bembenutty & Karabenick, 2004) have found that the reliability Cronbach alpha of ADOGS consistently ranges from .70 to .84, which are considered acceptable (Nunnally, 1978). Exploratory and confirmatory factor analyses have provided preliminary evidence of the construct validity of the ADOGS (Bembenutty & Karabenick, 1998).

Using the ADOGS, Bembenutty and Karabenick (2004) found an association between students' willingness to delay gratification and their tendencies to use cognitive strategies (e.g., elaboration,  $r = .38$ ) and self-management strategies (e.g., time and study management,  $r = .58$ ). They also found a significant correlation between academic delay of gratification and students' motivational tendencies (e.g., task-value,  $r = .35$ ). The aforementioned

tioned patterns of behavior suggest that delay of gratification is an important individual difference, which is enacted in relation to academic and classroom activities. Students who are willing to delay gratification for the sake of future academic rewards appear to perceive classroom-related tasks more favorably than students who are unwilling to delay gratification (Bembenutty & Karabenick, 2004). However, since these studies were correlational, it is not possible to make causal inferences, and a third unmeasured variable such as IQ, socioeconomic status, or religion could possibly provide a better explanation for the findings.

## Self-Efficacy Beliefs

Another important determinant of performance is *self-efficacy*, which refers to individuals' beliefs in their ability to perform expected tasks (Bandura, 1997; Chen, 2006; Chen & Zimmerman, 2007; Pintrich & Zusho, 2007; Schunk & Zimmerman, 2006). Academic self-efficacy refers to personal beliefs about one's capabilities to perform academic tasks, such as writing, reading, and mathematics. According to Bandura (1997), self-efficacy has five distinctive characteristics: (a) it involves *self-judgments* or *beliefs* about one's ability to perform activities, rather than beliefs about general personal qualities, such as one's physical characteristics or psychological traits; (b) it is *multidimensional*: rather than being a single disposition, it is linked to different domains of functioning (math or English); (c) it is *context-dependent* because many nonability influences can enhance or impede execution of skills; (d) it depends on a *mastery criterion* of success rather than normative or other criteria; and (e) it is *assessed before students* are asked to perform and thus can play a causal role in academic functioning. Self-efficacy has positive relationships with effort regulation, perseverance, increased persistence in seeking solutions, high level of academic achievement, and high intrinsic interest in the task. Self-efficacy is a better predictor of academic achievement than previous performance (Bandura, 1997).

Because higher self-efficacy has been linked to more successful academic motivation and performance (Bandura, 1997; Schunk & Zimmerman, 2006), it should influence students' delay preferences. Bembenutty (2002) examined the direct and indirect effects of academic delay of gratification and self-efficacy on academic performance among minority college students enrolled in an introductory writing course as part of a summer immersion program. Results indicated that delay of gratification was a significant mediator of students' self-efficacy and their final course grades. Two other important individual characteristics associated with learning that deserve attention from a self-regulation point of view are students' gender and their ethnicity.

## Gender and Ethnic Differences

According to Ormrod (2008a), an ethnic group shares a common culture, could be of similar race and/or national origin, and could have a common religious background. Researchers have identified characteristics in which learners may differ as a function of their ethnicity (Ormrod, 2008a). Students from underrepresented populations often obtain low scores in standardized tests compared with Caucasian students (Pintrich & Zusho, 2007; Schunk et al., 2008). There are also gender differences among learners. According to Ormrod, with regard to cognitive and academic abilities, boys and girls perform similarly on tests of general intelligence; however, boys in general have an advantage over girls in mathematical problem solving after puberty, whereas girls have an advantage over boys in reading and writing. Boys tend to express more physical aggression than girls; however, girls can be equally aggressive in interpersonal relationships. In class, boys tend to participate more and are more active than girls (Ormrod, 2008a). In contrast to female learners, males often obtain higher academic performance in areas such as mathematics (Ormrod, 2008a). However, all of these claims have been challenged (Eccles, 2007a, 2007b; Pintrich & Zusho, 2007).

Eccles (2007b) posited that gender differences in entry into physical science and engineering professions are related to the value each gender places on those occupations rather than on their personal competence or self-confidence. Eccles (2007b) also reported that women are socialized early in life to follow certain occupational paths, while men have been socialized to pursue different avenues. She postulated that educators need to provide information and instruction to women about the importance of these fields in such a way that women would find value in pursuing these occupations. Pintrich and Zusho (2007) observed that the literature on whether gender and ethnic differences are related to self-regulation is inconsistent and inconclusive. Certainly, more research on the impact of gender and ethnicity differences on self-regulation of learning is necessary.

## Aim of the Study

The aim of the present study was twofold. First, it examined gender and ethnic differences in the relationships between academic performance, self-regulation, motivation, and delay of gratification using correlational analyses. Second, this study investigated whether students from diverse gender and ethnic groups differed with regard to their use of self-regulation, motivation, delay of gratification, and academic performance using multivariate and univariate analyses of variance.

## Method

### *Participants*

Participants in this study were 364 college students (210 females, 146 males; 8 students did not report gender) enrolled in introductory psychology courses at a Midwestern public university. Because of a small representation of minority students in the sample, ethnicity was coded as Caucasian students ( $n = 269$ ), with

minority students ( $n = 95$ ) as the second group. Subsequently, four groups of students were created: Male Caucasians ( $n = 108$ ), Male Minorities ( $n = 38$ ), Female Caucasians ( $n = 161$ ), and Female Minorities ( $n = 57$ ). Independent  $t$  tests were computed to examine mean differences among the minority groups (43 African Americans, 6 Asian Americans, 14 Hispanics, 7 Native Americans, and 25 from other ethnic groups). The results indicated that on final course grade, self-efficacy beliefs, and academic delay of gratification, no mean differences were found between the different ethnic groups. Thus, for the purpose of analysis, all ethnic groups were aggregated into one large group. The data reported here were part of a larger research program on students' self-regulation and constitute an independent analysis of data previously reported (see Bembenutty & Karabenick, 1998).

### ***Instruments***

*Academic Delay of Gratification.* The students responded to the 10 scenarios on the Academic Delay of Gratification Scale (ADOGS; Bembenutty & Karabenick, 1998). In this study, the ADOGS had an internal consistency Cronbach  $\alpha = .72$ ; it examines students' delay of gratification preference in relation to the writing course the students were enrolled in when they responded to the study. In other words, ADOGS assesses content-specific and course-specific delay of gratification. The students rated their preference for an immediately available attractive option versus a delayed alternative. An example is "Go to a favorite concert, play, or sporting event and study less for this course even though it may mean getting a lower grade on an exam you will take tomorrow" versus "Stay home and study to increase your chances of getting a higher grade." Students responded on a 4-point scale: "Definitely choose A," "Probably choose A," "Probably choose B," and "Definitely choose B." Delay of gratification was considered here as a continuous variable; thus, responses were coded and added for the 10 items, then divided by 10 so that higher total scores indicated greater delay of grat-



ification (range 1 to 4). As described above, the psychometric properties of this scale have been established (Bembenutty, 1999, Bembenutty & Karabenick, 1998, 2004).

*Motivational and Use of Learning Strategies.* The Motivational Strategies for Learning Questionnaire (MSLQ) assesses students' course-specific motivation and use of learning strategies (Pintrich, Smith, Garcia, & McKeachie, 1993). The MSLQ consists of 81 statements in response to which students rate themselves along a 7-point scale ("not at all true of me" to "very true of me"). The MSLQ contains several scales. Motivation scales include intrinsic and extrinsic motivation, task value, control beliefs, self-efficacy, and test anxiety. Learning strategies scales include cognitive strategies (e.g., rehearsal, elaboration, organization, and critical thinking), metacognition, and resource management (time and study environment, effort regulation, peer learning, and help-seeking). Coding was applied so that higher scores represented higher levels of motivation and use of learning strategies. The psychometric properties of this scale also have been well-established (Garcia & McKeachie, 2005; Pintrich et al., 1993).

*Academic Performance.* Final course grades from the courses in which the students participated were converted to an 11-point scale ranging from  $E = 1$  to  $A = 11$ .

## Results

### *Correlational Analyses*

Correlation coefficients were computed to examine the relationships between all of the variables used in the study (see Tables 1 through 4). To ensure that the observed differences were unlikely due to sampling error, the differences between the correlation coefficients were tested for statistical significance using Fisher's  $Z$ -transformation of correlations ( $r$ ) between

**Table 1**  
Pearson Correlations Among Male Caucasian Students  
( $N = 108$ )

	Correlations																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Final Course Grade	--																
2. Delay of Gratification	.35	--															
3. Intrinsic Motivation	.30	.40	--														
4. Extrinsic Motivation	.21	.43	.32	--													
5. Task Value	.41	.37	.70	.37	--												
6. Control Beliefs	.19	.25	.29	.08	.24	--											
7. Self-Efficacy	.62	.38	.52	.38	.65	.45	--										
8. Test Anxiety	-.24	.09	-.20	.15	-.24	.07	-.33	--									
9. Rehearsal	.17	.45	.30	.41	.34	-.00	.17	.01	--								
10. Elaboration	.30	.44	.52	.30	.56	.18	.41	-.15	.63	--							
11. Organization	.08	.30	.32	.36	.26	.12	.17	.12	.57	.52	--						
12. Critical Thinking	.26	.22	.53	.18	.43	.15	.37	-.24	.33	.63	.32	--					
13. Metacognition	.26	.52	.59	.33	.50	.19	.40	-.13	.64	.73	.53	.64	--				
14. Time Management	.43	.68	.45	.27	.43	.18	.49	-.26	.49	.51	.33	.39	.68	--			
15. Effort Regulation	.44	.62	.44	.28	.52	.17	.59	-.34	.48	.53	.22	.30	.62	.80	--		
16. Peer Learning	.09	.13	.24	.21	.23	-.04	.13	-.04	.37	.38	.56	.37	.41	.16	.12	--	
17. Help-Seeking	-.08	.12	.19	.17	.16	-.09	.04	.10	.38	.26	.48	.22	.43	.10	.07	.62	--

Note. Correlations greater than .19 are significant at the  $p < .05$  level.

**Table 2**  
Pearson Correlations Among Male Minority Students ( $n = 38$ )

	Correlations																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Final Course Grade	--																
2. Delay of Gratification	-.15	--															
3. Intrinsic Motivation	.20	.10	--														
4. Extrinsic Motivation	.33	.27	.57	--													
5. Task Value	.35	.02	.82	.58	--												
6. Control Beliefs	.07	-.28	.35	.12	.33	--											
7. Self-Efficacy	.51	.02	.54	.54	.58	.38	--										
8. Test Anxiety	-.03	.05	-.20	-.18	-.18	-.02	-.16	--									
9. Rehearsal	-.05	.53	.18	.45	.15	-.02	.11	.20	--								
10. Elaboration	.28	-.02	.44	.48	.51	.34	.43	-.14	.23	--							
11. Organization	-.05	.56	.35	.48	.38	-.06	.05	.06	.63	.50	--						
12. Critical Thinking	-.08	-.03	.35	.13	.21	.41	.21	.03	.06	.50	.23	--					
13. Metacognition	.12	.27	.66	.71	.63	.28	.44	-.29	.50	.65	.65	.52	--				
14. Time Management	.13	.54	.41	.50	.39	.09	.24	-.12	.70	.33	.68	.09	.67	--			
15. Effort Regulation	.19	.51	.56	.54	.53	.00	.51	-.22	.54	.43	.60	.14	.60	.72	--		
16. Peer Learning	.01	.16	.24	.19	.16	.11	-.06	.27	.12	.30	.36	.49	.37	.35	.03	--	
17. Help-Seeking	-.06	.16	.18	.24	.08	.19	.16	.25	.08	.24	.25	.26	.22	.23	.10	.68	--

Note. Correlations greater than .33 are significant at the  $p < .05$  level.

**Table 3**  
 Pearson Correlations Among Female Caucasian Students ( $n = 165$ )

	Correlations																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Final Course Grade	--																
2. Delay of Gratification	.20	--															
3. Intrinsic Motivation	.11	.30	--														
4. Extrinsic Motivation	.14	.37	.26	--													
5. Task Value	.23	.32	.62	.41	--												
6. Control Beliefs	.15	.02	.29	.21	.33	--											
7. Self-Efficacy	.62	.24	.44	.33	.52	.40	--										
8. Test Anxiety	-.12	.13	.04	.12	.09	-.08	-.26	--									
9. Rehearsal	.06	.34	.26	.50	.35	.15	.22	.18	--								
10. Elaboration	.13	.37	.56	.30	.54	.28	.41	.10	.48	--							
11. Organization	-.03	.38	.24	.23	.19	.04	.13	.14	.53	.52	--						
12. Critical Thinking	.15	.26	.54	.20	.49	.13	.44	.16	.34	.68	.36	--					
13. Metacognition	.08	.53	.54	.38	.47	.18	.41	.12	.55	.69	.595	.62	--				
14. Time Management	.24	.66	.40	.46	.40	.11	.40	-.05	.48	.50	.43	.36	.60	--			
15. Effort Regulation	.41	.55	.50	.42	.54	.22	.56	-.04	.43	.54	.35	.40	.59	.67	--		
16. Peer Learning	-.11	.03	.15	.17	.10	-.05	-.03	.26	.23	.27	.36	.37	.28	.03	-.01	--	
17. Help-Seeking	-.03	.14	.09	.17	.16	-.02	.02	.10	.16	.22	.32	.18	.25	.08	.00	.63	--

Note. Correlations greater than .15 are significant at the  $p < .05$  level.

**Table 4**  
 Pearson Correlations Among Female Minority Students ( $n = 58$ )

	Correlations																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Final Course Grade	--																
2. Delay of Gratification	.08	--															
3. Intrinsic Motivation	.27	.32	--														
4. Extrinsic Motivation	.32	.20	.37	--													
5. Task Value	.38	.24	.53	.40	--												
6. Control Beliefs	.44	.09	.28	.33	.43	--											
7. Self-efficacy	.75	.18	.42	.51	.52	.53	--										
8. Test Anxiety	-.40	-.14	-.18	-.02	-.06	-.23	-.53	--									
9. Rehearsal	.09	.39	.30	.14	.29	.09	.14	.00	--								
10. Elaboration	.18	.42	.52	.22	.43	.02	.32	-.05	.58	--							
11. Organization	-.08	.39	.10	.08	.12	-.10	.00	.01	.69	.57	--						
12. Critical Thinking	.03	.11	.22	.28	.26	-.12	.17	-.05	-.06	.38	.12	--					
13. Metacognition	.16	.38	.43	.26	.45	-.05	.34	-.18	.52	.75	.52	.48	--				
14. Time Management	.15	.44	.52	.18	.38	.04	.35	-.32	.57	.50	.46	.14	.53	--			
15. Effort Regulation	.42	.58	.49	.41	.67	.32	.53	-.33	.40	.52	.27	.18	.54	.63	--		
16. Peer Learning	.11	.13	.23	.00	.07	-.04	.13	.01	.27	.25	.11	.26	.28	.35	.16	--	
17. Help-seeking	.08	.19	.01	.02	.08	-.00	.19	-.17	.08	.11	.07	.22	.18	.24	.24	.39	--

Note. Correlations greater than .25 are significant at the  $p < .05$  level.

**Table 5**

Fisher's Z-Transformation of Correlations ( $r$ ) Between Academic Delay of Gratification, Self-Efficacy, and Final Course Grade Among Students From Different Gender and Ethnic Groups

Groups	Fisher's Z-Transformation of $r$		
	Academic Delay of Gratification and Final Course Grade	Self-Efficacy and Final Course Grade	Delay of Gratification and Self-Efficacy
Male Caucasian vs. Male Minority	2.64	0.83	1.95
Male Caucasian vs. Female Caucasian	1.29	0.00	1.24
Male Caucasian vs. Female Minority	1.71	1.49	1.31
Male Minority vs. Female Caucasian	1.90	0.87	1.21
Male Minority vs. Female Minority	1.07	1.90	0.75
Female Caucasian vs. Female Minority	0.79	1.59	0.40

some of the variables (Glass & Hopkins, 1996; see Table 5). A Bonferroni correction was used to safeguard against multiple tests of statistical significance in the present study (Abdi, 2007). The Bonferroni correction is a very restrictive criterion, used to minimize the Type 1 error rate. By applying the Bonferroni correction to six comparisons, the  $Z$ -score needed to be greater than 2.34 to be considered statistically significant.

Regarding the correlations between final course grade and academic delay of gratification, the correlation was statistically significant for Caucasian males ( $r = .35$ ) and Caucasian females ( $r = .20$ ). However, these correlations were not statistically significant for minority students (male minority students  $r = -.15$ ; female minority students  $r = .08$ ). However, comparisons on correlations using  $Z$ -transformed scores between any of the

six possible combination of the four groups indicated that these correlations were not significantly different from each other after applying the Bonferroni criterion (all  $Z$ s were smaller than the 2.35 criterion).

Regarding the motivational variables, among the Caucasian males, course grade was significantly related to intrinsic ( $r = .30$ ) and extrinsic motivation ( $r = .21$ ), task value ( $r = .41$ ), and self-efficacy ( $r = .62$ ). Among minority males, course grade was related to task value ( $r = .35$ ) and self-efficacy ( $r = .51$ ). Among Caucasian females, course grade was related to task value ( $r = .23$ ) and self-efficacy ( $r = .62$ ). Finally, among minority females, grade was related to intrinsic ( $r = .27$ ) and extrinsic motivation ( $r = .32$ ), task value ( $r = .38$ ), control beliefs ( $r = .44$ ), and self-efficacy ( $r = .75$ ). Test anxiety was negatively related to final course grade for Caucasian males ( $r = -.24$ ) and for minority females ( $r = -.40$ ), but it was not related to final course grade for minority males ( $r = -.03$ ) or Caucasian females ( $r = -.12$ ). Again, comparisons on correlations using Bonferroni-corrected  $Z$ -transformed scores indicated that these correlations were not significantly different from each other.

Among Caucasian males, course grade was associated with students' reported use of elaboration ( $r = .30$ ), critical thinking ( $r = .35$ ), and metacognition ( $r = .26$ ). However, for minority males and females and for Caucasian females, final course grade was not related to any of the students' reported use of cognitive strategies.

An examination of the associations between resource management strategies and course grade indicated that for Caucasian males, there were positive correlations between course grade and time management ( $r = .43$ ) and effort regulation ( $r = .44$ ). Among minority males, there were no significant correlations between any of the variables. In contrast, for Caucasian females, course grade was correlated with time management ( $r = .24$ ) and effort regulation ( $r = .41$ ). Effort regulation was also related to course grade among minority females ( $r = .42$ ). Notably, peer learning and help-seeking were not related to course grade for any of the four groups of students.

While there were differences in the magnitudes of the correlations among the four groups of students, none of the differences in these correlation coefficients were statistically significant. Therefore, the results of these correlational analyses must be interpreted with caution. It is possible that true differences do exist in the magnitudes of these correlations across the four groups of students, and that these differences failed to reach statistical significance given the small cell sizes. However, it is also very likely that the observed differences were simply a result of sampling error.

### *Univariate and Multivariate Analyses*

To address the second aim of the study, multivariate analyses of variance (MANOVA) were conducted with all of the dependent variables in the study. The independent variables were gender (males = 0, females = 1) and ethnicity (Caucasians = 0, minorities = 1). The results of the MANOVA indicated a significant main effect for gender,  $\lambda = .88$ ,  $F(1, 320) = 2.47$ ,  $p < .001$ , partial eta-squared ( $\eta^2$ ) = .12, and for ethnicity,  $\lambda = .88$ ,  $F(1, 320) = 2.49$ ,  $p < .001$ , partial eta-squared ( $\eta^2$ ) = .12. However, no interaction was found between ethnicity and gender,  $\lambda = .96$ ,  $F(1, 320) = 0.78$ ,  $p > .05$ , partial eta-squared ( $\eta^2$ ) = .04. Although no interaction existed between gender and ethnicity, all four groups were used for the follow-up ANOVAs to compare the means between of each of the individual groups.

The MANOVA was followed by 17 univariate analysis of variance (ANOVAs), one per dependent variables, and subsequently by Tukey's honestly significant differences (HSD) to test group comparisons (see Table 6). Eta-squared effect sizes are also reported in Table 5. Eta squared indicates the proportion of variance in the dependent variables that is explained by a group's differences. In addition, for all statistically significant group differences, Cohen's  $d$  effect sizes are also reported. The effect sizes indicate how many standard deviations apart the means were. For the ANOVAs, Caucasian males were coded 1, minority males 2, Caucasian females 3, and minority females 4. As shown in Table



**Table 6**

Means, Standard Deviations, One-Way Analysis of Variance (ANOVA), and Post Hoc Analyses (Tukey HSDs) Results for Gender and Ethnicity

	Male-Caucasian <i>n</i> = 108 <i>M</i> ( <i>SD</i> ) 1	Male-Minority <i>n</i> = 38 <i>M</i> ( <i>SD</i> ) 2	Female-Caucasian <i>n</i> = 161 <i>M</i> ( <i>SD</i> ) 3	Female-Minority <i>n</i> = 57 <i>M</i> ( <i>SD</i> ) 4	<i>F</i>	Partial Eta Squared
<b>Achievement and Motivation</b>						
Final Course Grade	9.82 (2.38) A-	8.19 (2.89) B	10.12 (2.39) A-	8.37 (3.40) B	10.07***	.069
	1 differs from 2 (Cohen's <i>d</i> = .57); 1 differs from 4 (Cohen's <i>d</i> = .50); 2 differs from 3 (Cohen's <i>d</i> = .61); 3 differs from 4 (Cohen's <i>d</i> = .57)					
Delay of Gratification	2.70 (.45)	2.87 (.45)	2.84 (.47)	2.99 (.46)	5.19**	.043
	1 differs from 4 (Cohen's <i>d</i> = .57)					
Intrinsic Motivation	4.80 (1.00)	4.78 (1.03)	4.80 (.99)	5.00 (.97)	0.69	.007
Extrinsic Motivation	5.41 (1.06)	5.63 (1.01)	5.33 (1.16)	5.50 (.87)	0.92	.010
Task Values	5.19 (1.29)	5.09 (1.32)	5.55 (1.11)	5.50 (.97)	3.07*	.018
Control Beliefs	5.83 (.89)	5.58 (1.03)	5.71 (.89)	5.48 (.89)	1.92	.009
Self-Efficacy	5.57 (1.04)	5.17 (1.14)	5.29 (1.11)	5.04 (1.29)	3.63*	.021
	1 differs from 2 (Cohen's <i>d</i> = .44); 3 differs from 4 (Cohen's <i>d</i> = .34)					

Cognitive Strategies						
Test Anxiety	3.78 (1.34)	3.90 (1.34)	3.78 (1.34)	4.07 (1.34)	0.96	.007
Rehearsal	1.24 (.25)	4.77 (1.24)	4.69 (1.24)	4.71 (1.37)	3.51*	.026
1 differs from 3 (Cohen's $d = 0.35$ ); 1 differs from 4 (Cohen's $d = 0.35$ )						
Elaboration	4.45 (1.10)	4.40 (.97)	4.73 (1.06)	4.81 (.91)	2.70*	.021
Organization	1.48 (1.07)	3.64 (1.39)	1.87 (1.25)	3.94 (1.31)	2.83*	.026
1 differs from 3 (Cohen's $d = 0.32$ )						
Critical Thinking	4.36 (1.22)	4.23 (1.25)	4.08 (1.31)	4.16 (1.19)	1.03	.011
Metacognition	4.29 (.99)	4.11 (.94)	4.30 (.93)	4.45 (1.02)	1.17	.006
Resource Management Strategies						
Time and Study Management	4.50 (1.14)	4.45 (1.06)	4.44 (1.19)	4.69 (1.09)	0.73	.003
Effort Regulation	4.59 (1.35)	1.41 (1.32)	4.94 (1.33)	1.15 (1.23)	3.89**	.029
2 differs from 4 (Cohen's $d = .57$ )						
Peer Learning	2.85 (1.39)	3.20 (1.51)	2.90 (1.48)	2.87 (1.45)	0.58	.008
Help Seeking	3.31 (1.26)	3.55 (1.19)	3.49 (1.30)	3.27 (1.36)	.76	.007

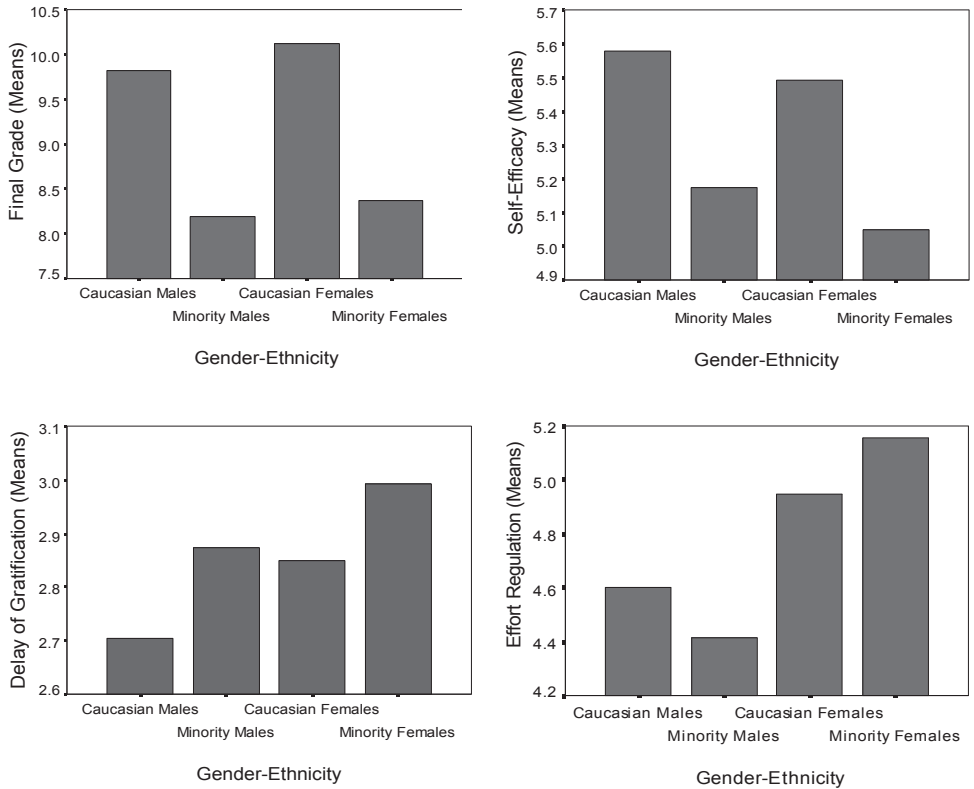
Note. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . † The numbers in parentheses along the significance groupwise comparisons are Cohen's  $d$ .

6, significant mean differences were found among the students on grade,  $F(1, 320) = 10.07, p < .001$ , partial  $\eta^2 = .069$ . The post-hoc test indicated that Caucasian males had higher grades than minority males (Cohen's  $d = .57$ ) and minority females (Cohen's  $d = .50$ ). Caucasian females had higher grades than minority males (Cohen's  $d = .61$ ) and minority females (Cohen's  $d = .57$ ). Caucasian males did not differ from Caucasian females and minority males did not differ from minority females. Overall, minorities obtained lower grades than Caucasian students.

Table 6 shows significant mean differences among the students on academic delay of gratification,  $F(1, 320) = 5.19, p < .01$ , partial  $\eta^2 = .043$ . The post-hoc test indicated that Caucasian males had lower academic delay of gratification than minority females (Cohen's  $d = .57$ ). Caucasian males did not differ from minority males or Caucasian females. Among the four groups, Caucasian males reported the lowest willingness to delay gratification (see Figure 1).

Among the motivational variables, there were mean differences on task value,  $F(1, 320) = 3.07, p < .05$ , partial  $\eta^2 = .018$ ; however, a post-hoc analysis revealed no differences between the groups at the  $p < .05$ . No mean differences were found among the four groups on intrinsic motivation, extrinsic motivation, control beliefs, or test anxiety. However, the groups differed on self-efficacy beliefs,  $F(1, 320) = 3.63, p < .05$ , partial  $\eta^2 = .021$ . The post-hoc test indicated that Caucasian males (Cohen's  $d = .45$ ) and Caucasian females (Cohen's  $d = .34$ ) had higher self-efficacy than minority females. Among the four groups, Caucasian males and females reported the highest confidence level, while minority males and minority females reported the lowest confidence level (see Figure 1).

Among the cognitive strategies, the results indicated significant mean differences among the students on rehearsal,  $F(1, 320) = 3.51, p < .05$ , partial  $\eta^2 = .026$ . The post-hoc test indicated that Caucasian males had lower rehearsal scores than Caucasian females (Cohen's  $d = 0.34$ ) and minority females (Cohen's  $d = 0.35$ ). Caucasian males did not differ from minority males (see Table 6). The four groups did not differ on reporting use of critical thinking or metacognitive strategies. However, they differed



**Figure 1.** Mean differences between the students.

on their reported use of organizational strategies,  $F(1, 320) = 2.83, p < .05$ , partial  $\eta^2 = .026$ . The post-hoc test indicated that Caucasian males reported less frequent use of organizational strategies than Caucasian females (Cohen's  $d = 0.33$ ). Although the ANOVAs indicated mean differences between the four groups,  $F(1, 320) = 2.70, p < .05$ , partial  $\eta^2 = .021$ , the post-hoc analysis indicated no differences between them.

Regarding resource management strategies, the results indicated significant mean differences among the students only on effort regulation,  $F(1, 320) = 3.89, p < .01$ , partial  $\eta^2 = .029$ . As shown in Figure 1, the post-hoc test indicated that minority males reported engaging in less effort regulation than minority females (Cohen's  $d = 0.57$ ). The four groups of students were not

statistically different from each other on time and study management, peer learning, and help-seeking (see Table 6).

## Discussion

### *First Aim of the Study: Associations Between the Variables*

The first aim of this study was to examine whether gender and ethnic differences existed in the *relationships* between academic achievement, learners' use of self-regulation of learning and motivation, and delay of gratification. The outcome of the study was ambiguous in this regard. The results of the correlation suggested that the association between students' motivation, academic achievement, and self-regulation might depend on the gender and ethnic group of the students. Regarding the association between final course grade and academic delay of gratification, there was a positive correlation for Caucasian students but not for minority students. However, these correlations were not significantly different from each other (all  $Z$ s were smaller than the 2.35 criterion). Interestingly, these results differ from another study that reported a positive association between delay of gratification and grades among Korean college students,  $r = .35, p < .05$  (Bembenuddy, 2007). Certainly, future studies need to investigate these associations among these variables for African Americans and Hispanic learners.

A notable finding was that all of the reported self-efficacy beliefs of all four groups of students were moderately to highly correlated with grade. For minority females, the correlation was .75, which indicates a strong relationship between self-efficacy and grades. It is notable that the confidence in capability to perform designated tasks in the course as reported by minority students was strongly associated with their performance, confirming the ability of self-efficacy to predict performance for both minority and Caucasian students. Again, these correlations were not significantly different from each other (all  $Z$ s were smaller than the 2.35 criterion).

Students' reported task value was associated with course grade for all groups, suggesting that they considered the course material of value to their future professional careers and lives. This finding is important because independent of their gender and ethnicity, these students' evaluation of how important, interesting, and useful the tasks were for them was associated with their obtained course grade. Future research should further explore these associations. Control beliefs were related to grade for minority females only. Minority females believed that their efforts to learn in the course would result in positive outcomes, and that if they tried hard enough, they would understand the course material.

The association between test anxiety and final course grade was negative and significant for both Caucasian males and minority females. Because in the present study causation cannot be assumed, the directionality of the test anxiety effect needs to be explored in future research. In any case, at least for Caucasian males and minority females, these results support previous research that suggest that test anxiety has a negative association with academic performance (Matthews, Zeidner, & Roberts, 2006; Zeidner & Matthews, 2005). Test anxiety was not related to academic delay of gratification for any of the four groups.

The correlation between grade and cognitive strategies was positive for Caucasian males, and only for elaboration, critical thinking, and metacognition. For the other three groups, the correlation between their reported use of rehearsal, elaboration, organization, critical thinking, metacognition, and final course grade was not statistically significant; indeed, some of these associations were in the negative direction for at least three of the groups. Once again, using the Bonferroni criterion, none of these correlations were different from each other. It is plausible that some of the scales were not sensitive enough to capture the diverse cognitive processes that the students may use to learn, the instruction and course examinations may not have required a deep level of information processing, or that some of the students did not yet know how to use these cognitive strategies. Clearly, future studies will need to investigate these findings, and

educators may need to consider innovative ways to help students to better use these strategies to improve course performance.

Gender and ethnic differences on the association between delay of gratification and the cognitive strategies revealed some unexpected results. Rehearsal and organization were related to delay of gratification for all four groups. Elaboration and metacognition were related to delay of gratification for all groups except minority males. However, critical thinking was related to delay of gratification only for Caucasian learners. These findings are important because they identify delay of gratification as a self-regulatory strategy related to cognitive functioning (Ayduk, Rodriguez, Mischel, Shoda, & Wright, 2007; Mischel, 1996).

The association between resource management strategies and course grade indicated that for Caucasian males and females, time management was also related to performance in the class. Peer learning and help-seeking were unrelated to academic performance among all students. This finding is critical given recent research suggesting that help-seeking from peers, teachers, and knowledgeable individuals is a self-regulatory learning strategy that results in positive academic outcomes and the present study seems to contradict this finding (Zusho et al., 2007).

### *Second Aim of the Study: Mean Differences*

In this study, the students in these diverse gender and ethnic groups did not homogeneously report behaviors oriented toward the attainment of academic goals. In the present investigation, Caucasian students obtained significantly higher course grades than minority students. However, Caucasian male students differed only from minority females on delay of gratification. Minority females reported a higher willingness to delay gratification than Caucasian males; however, their course grades were lower, which might be explained by their reported low confidence level.

Caucasian males and minority males differed in terms of their motivational beliefs; minority males reported lower confidence in their capability to perform designated academic tasks

than Caucasian males. Caucasian females reported higher self-efficacy beliefs than minority females. Again, these results are of concern for minority students because they reported lower confidence levels and lower course grades than Caucasian learners. These findings call for additional studies to investigate and identify the socialization processes and classroom contexts that influence such patterns of behavior. It is likely that other variables also explain these findings and shed light on this issue.

Caucasian males reported less frequent use of rehearsal strategies than Caucasian females. Caucasian males also had lower organization scores than Caucasian females. Among resource management strategies, only one of them indicated a mean difference—effort regulation; here, minority males had significantly lower effort regulation than minority females. It is conceivable that the gender socialization process may explain these differences. For instance, females may be expected to display more organization skills and engage in effort regulation than males, or males may believe that it is not socially acceptable to admit having high organization skills and effort regulation. Gender socialization plays a role in the ways students respond to educational demands (Eccles, 2007a, 2007b). Often, educators respond differently to males and females in the classrooms, a behavior that could lead students to believe that certain behavior patterns associated with their gender are expected by their teachers (Eccles, 2007a, 2007b). More research is needed to examine the sources and influences of these students' beliefs and behavior.

These findings support the notion that delay of gratification is an important variable associated with academic achievement (Bembenutty & Karabenick, 2004; Mischel, 1996; Mischel, Cantor, & Feldman, 1996). Academic delay of gratification was associated with students' motivation and use of cognition and self-regulation. Accordingly, these findings suggest that delay of gratification could serve an important role in helping students to activate mental representations of their academic goals and plans, as well as to facilitate the selection of behavioral actions to secure environmental control while pursuing long-term academic goals (Bembenutty, 1999). Delay of gratification is neces-



sary when pursuing academic goals and when competing goals require students' focused attention (Bembenutty & Karabenick, 2004).

Overall, the minority students in this study obtained lower final course grades than the Caucasian students. These results should be taken very seriously. If minority students are not receiving adequate academic training at their colleges, then their academic performance could be negatively affected. If these students are succumbing to attractive distractions when they should be enacting academic goals, then they may not succeed at today's educational and career demands.

A point of clarification is important. The results of this study should not be interpreted as suggesting that males and females and Caucasian and non-Caucasian students are inherently different in ways that lead them to achieve or engage in academic endeavors in particular ways and on different paths from each other (Pintrich & Zusho, 2007). The socialization process and classroom contexts, including academic tasks, reward structures, instructional methods, and instructor behaviors, may be associated with the patterns of behavior reported by the students in this study.

## Educational Implications

Educators have an important role in enhancing their students' willingness to delay gratification. Educators could boost their students' willingness to delay gratification by: (a) promoting the importance and effectiveness of setting academic goals; (b) providing opportunities for students to examine their self-efficacy beliefs before starting academic tasks; (c) promoting help-seeking skills; (d) promoting self-recording, self-monitoring, and self-instruction during task completion; (e) engaging in academic planning; (f) reinforcing effort and interest in course material; (g) providing evidence of the utility value of the task; (h) imparting instruction in ways that attract the attention and interest of the students; (i) teaching cognitive strategies such

as organization, rehearsal, elaboration, and critical thinking; (j) requiring interesting and entertaining homework assignments; (k) dividing tasks into short intervals or components to promote distributive practice; and l) providing effective feedback on all assignments (Bembenutty, 1999, 2007; Bembenutty & Karabenick, 2004)

The results suggest that students' self-efficacy beliefs are strongly related to their academic achievement. Instructors can boost students' self-efficacy by: (a) demonstrating confidence in their students' ability to perform designated tasks, (b) modeling the necessary steps of any particular task, (c) providing guided practice in such a way that the students could see how they are progressing on the designated task, (d) teaching self-regulatory learning strategies such as goal setting, planning, help seeking, and self-monitoring, (e) teaching cognitive strategies such as elaboration, rehearsal, organization, and critical thinking, (f) providing immediate and positive feedback, reinforcing effort, and by (g) associating prior successful performance with current performance (Mayer, 2008; Ormrod, 2008b; Schunk et al., 2008).

Educators could help all of their students by teaching them how to use cognitive strategies. The teacher's role in the classroom is not just teaching the content area, but also promoting active learning. Helping the students to learn cognitive strategies would facilitate the students' acquisition of new material. In the case of elaboration, educators could help their students to store information into their long-term memory by building mental connections between the different information provided in class with their prior knowledge and by paraphrasing the new information and creating analogies. In terms of organizational strategies, educators could help their students by providing opportunities to select appropriate information and classify it by creating clusters and outlines.

Educators also could help their students by giving to them opportunities to manage and regulate their time and their study environments. One excellent strategy is to have students use weekly planners to keep track of their academic activities. The

students could also use self-monitoring forms in which they could keep track of how much time they dedicate to their academic tasks versus their nonacademic tasks and create charts reflecting the outcomes of those activities.

Educators should explore ways to enhance the learning experiences and academic performance of all learners. Based on the post hoc analyses and Cohen's *d* effect sizes, there were differences among the students on course grades. Even when the students' reported intrinsic and extrinsic motivation, control beliefs, task value, test anxiety, elaboration, critical thinking, and metacognition did not differ across subgroups, their course performance did. Certainly, it appears that other factors not accounted for in the present study may be associated with the students' level of academic performance. Among those other possible variables, gender socialization, ethnic identity, relationship with the instructors of the course, and socioeconomic status could serve to explain these current findings. However, educators may be able to alleviate this issue by a creating classroom atmosphere in which all learners are feeling welcome, actively involved, and motivated to participate irrespective of their gender or ethnicity.

## Limitations and Future Research

The design of this study was correlational. Longitudinal or experimental studies should examine students' beliefs, motivation, and willingness to delay gratification; these studies could better identify the extent to which the differences found in this study are robust, manipulable, and consistent across time. Additional information about the students, including socioeconomic status, parental education, previous academic performance, beliefs about education, and attitude toward college, would also be of interest. These limitations should be addressed in future research on the impact of students' tendencies to delay gratification, their motivational beliefs, and their use of cognitive and self-regulatory strategies on academic-related outcomes. In addition, another limitation of the study is its small sample size, especially

for minority female students, which impacted the power of this study and may have contributed to the limited statistical findings of the study.

As in previous studies, the results of this study are inconclusive about gender and ethnic differences on self-regulation. Thus, additional studies need to examine these associations (Pintrich & Zusho, 2007). This study does not provide any explanation or description of the psychological context of the classrooms, the behaviors of course instructors, the students' socioeconomic status, or the students' family or job responsibilities outside of the university. Nevertheless, the findings of this study contribute to our understanding of individual differences in self-regulation of learning. This study sheds light on gender and ethnic differences in a college setting. Because ethnic minority enrollment is increasing annually, colleges and universities will need to explore ways to attract all learners, particularly from underrepresented groups. The gender and ethnic group differences in motivation, use of cognitive strategies, and self-regulation found in this study may be useful in helping concerned educators to develop meaningful classroom work for students of all backgrounds.

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## Author Note

I am thankful to Dr. Stuart A. Karabenick for his intellectual contribution to the research design, data analysis, and conceptualization of the constructs examined in this study. I am grateful to Dr. Bill McKeachie and Dr. Yi-Guang Lin for their suggestions on an early draft of this paper.

