

ACADEMIC DELAY OF GRATIFICATION

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ABSTRACT: Academic delay of gratification (ADOG) refers to students' postponement of immediately available opportunities to satisfy impulses in favor of pursuing chosen important academic rewards or goals that are temporally remote but ostensibly more valuable. In Study 1, we developed a course-specific academic delay of gratification scale (ADOGS) with acceptable psychometric properties. Results of Study 2 supported the hypothesized association between ADOG and students' self-regulated learning, which consisted of academic motivation and the use of cognitive, metacognitive, and resource management learning strategies. Discriminant validity of the ADOGS is indicated by its stronger correlations with students' self-regulation than found for instruments that measure closely-related constructs (generalized deferment of gratification and impulsivity). The conceptual status of ADOG as a strategy and outcome of successful strategy use is discussed.

One of the hallmarks of students' self-regulated learning is the ability to remain goal oriented by protecting task-specific intentions from non-task alternatives (Corno 1989; García, McCann, Turner, & Roska 1998; Pintrich, Roeser, & De Groot 1994; Snow, Corno, & Jackson 1996; Wolters 1998; Zimmerman 1994, 1998). Because such protection often involves foregoing an attractive, immediately obtainable goal (e.g., going to the movies) in order to pursue long-range academic objectives (e.g., a college degree), this process can be linked to delay of gratification (Mischel 1981). According to Mischel, delay of gratification is a component of the self-regulatory system (Mischel 1973, 1996; Mischel, Cantor, & Feldman 1996) that is necessary for individuals to guide their behavior without an external coercive stimulus. Although evidence supports the expected relationships between delay of gratification and higher academic achievement, intelligence, and need for

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Learning and Individual Differences, Volume 10, Number 4, 1998, pages 329–346.
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ISSN: 1041-6080

achievement (e.g., Mischel 1961; Mischel & Metzner 1962; Mischel, Shoda, & Peake 1988; Strauss 1962), a comprehensive examination of delay of gratification's role in self-regulated learning is required. This necessitated the development of a more adequate way to assess delay of gratification in academic contexts (i.e., academic delay of gratification—ADOG), which was used to determine the association between delay and students' academic motivation and their use of cognitive, metacognitive, and resource management learning strategies. By so doing, we also proposed to explicate the conceptual status of ADOG.

Initially, Mischel (Mischel & Mischel 1983) viewed delay of gratification as an ability or competence (Mischel et al. 1988) that children develop over time by learning delay-relevant strategies such as imagining the temporally remote goal, self-verbalization, and the control of attention. Others focus on delay as a relatively stable personality disposition (Funder, Block, & Block 1989). This perspective has been expanded to embed delay of gratification within the broader framework of self-regulation (Mischel 1996; Mischel et al. 1996) and action control (Heckhausen 1991; Kuhl 1984; Mischel 1984). According to action control theory, in particular, delay of gratification would be an outcome of students' successful use of volitional control strategies (Kuhl 1985; Snow et al. 1996). As suggested by Kuhl (1985), when individuals experience internal or external distraction from enacting intentions, there are several strategies that will help them to remain task focused, including selective attention and the control of encoding, motivation, emotion, the environment, and information processing. For example, motivational control involves such activities as visualizing the completion of homework and devising ways to make it more challenging (Snow et al. 1996).

It is also possible to view delay of gratification as a strategy that is employed to achieve long-term goals in the same manner as other learning strategies that facilitate goal-directed and purposive behavior. Here, delay of gratification is considered a controllable activity, although not always conscious (Cantor & Langston 1989), in which cognitive operations and motivational determinants orchestrate to accomplish goals (Pressley & McCormick 1995). As a strategy, delay would be activated by the same motivational determinants (e.g., expectancy and task value) as would other cognitive, metacognitive, and resource management strategies (Pintrich & DeGroot 1990). As a consequence, we expect that ADOG would be related to students' use of other strategies, as suggested by the volitional, action control, and self-regulation literature (García et al. 1998; Corno 1993; Snow et al. 1996). It should be stated at the outset that considering ADOG as a strategy does not necessarily add to the category of basic volitional control strategies outlined by Kuhl (1985) and Corno (1993). Rather, whereas ADOG may have elements in common with those basic strategies, it also provides a unique contribution to the successful completion of academic goals in a specific context.

In order to more completely understand the conceptual status of delay of gratification, the present study was designed to assess its relationship to student motivation and use of other learning strategies. Although delay of gratification has not been integrated into the extensive literature on students' use of cognitive and metacognitive strategies, there is considerable evidence to suggest such linkage, given that the strategies that facilitate delay of gratification are similar to those

that facilitate learning. For example, rehearsal, encoding, and self-generation of internal situations that facilitate delay (Mischel & Shoda 1995) are similar to the cognitive resources, for example, rehearsal, elaboration, organization, and critical thinking, that are used by students to assimilate academic material (McKeachie 1999; Pintrich, Smith, García, & McKeachie 1993; VanderStoep, Pintrich, & Fagerlin 1996). It is proposed that these similar sets of strategies may serve more than one purpose: (a) to help learners more effectively acquire knowledge and (b) to assist them in carrying out intentions by remaining task focused, in part by delaying gratification. As a consequence, learners who use such strategies should be more likely to delay gratification. A similar argument can be made for the use of metacognitive learning strategies, such as planning, monitoring, and self-regulation (Brown, Bransford, Ferrara, & Campione 1983; Flavell 1979; Pintrich & De Groot 1990), which are also related to the ability to delay gratification (Mischel 1981). The most direct conceptual link between delay of gratification and learning strategies, however, is that between delay of gratification and resource management, which includes the amount of time dedicated to study, the effective structuring of one's study environment, and efforts to persist when necessary (Pintrich et al. 1993). That is, students who delay gratification should also report having spent more time studying, arranging their schedules and study environments, and persisting when tasks are less interesting or more difficult. The strongest associations, in fact, should be found for delay of gratification and strategies that involve the temporal dimensions.

The preceding discussion suggests that delay of gratification is also influenced by individuals' goals (Mischel et al. 1996; Pervin 1983), which could include the pursuit of academic success. From an expectancy-value perspective, the degree to which students pursue academic goals is determined by (a) their expectancy of success and self-efficacy, which has been consistently related to performance (e.g., Bandura 1986, 1997; Pajares 1996; Pintrich & De Groot 1990; Schunk 1994); (b) task value, or how important, interesting, and useful students perceive academic tasks to be (Eccles 1983; Eccles, Wigfield, & Schiefele 1998; Pintrich et al. 1994; Wigfield, Eccles, & Rodríguez 1998); and (c) learning goals, such as intrinsic and extrinsic motivation (Deci & Ryan 1985; García & Pintrich 1994; Pintrich & Schunk 1996; Pintrich et al. 1993; Ryan & Deci 1996). We expect that students who have higher expectancy and self-efficacy beliefs, value their academic tasks, and are more intrinsically and extrinsically interested will be more likely to delay gratification. For example, students who are highly motivated to learn would be more likely to stay in the library and postpone the immediate gratification that would be derived from having fun with friends, in order to ensure that they finished an assignment that was due the next day.

Examining these associations requires an appropriate way to assess delay of gratification in academic contexts. To date, several experimental methods and instruments have been used to manipulate and to assess delay of gratification in children, adolescents, and adults (Rosenbaum & Ben-Ari Smira 1986). For example, Mischel's (Mischel et al. 1996) basic assessment paradigm to assess delay of gratification involved offering children the choice between an immediately available smaller, tangible reward, for example, candy, or a larger reward if they were

willing to wait. Methods used to assess individual differences in delay of gratification include the Q-sort technique (Funder et al. 1989) and surveys. For example, Ray and Najman (1986) developed a deferment of gratification questionnaire (referred to here as the DGQ) that employs a self-description technique that assesses the general disposition in that tendency (e.g., "Are you good at saving your money rather than spending it straight away?"). Witt (1990a, 1990b) employed the DGQ as well, with a Likert-type format. Finally, Ward, Perry, Woltz, and Doolin (1989), using the multidimensional delay of gratification (MDG) scale, employed a forced-choice response format (e.g., "Go to a favorite concert and risk getting a bad grade, or stay home and study to get a better grade.") to assess delay of gratification in general academic domains. In contrast, delay of gratification in an academic context refers to students' postponement of immediately available opportunities to satisfy impulses in favor of pursuing chosen important academic rewards or goals that are temporally remote but ostensibly more valuable. Here we restrict the focus of delay of gratification. This is why, in an academic setting, we refer to it as ADOG.

According to the previous discussion and following the approach of Pintrich and his colleagues (e. g., Pintrich & De Groot 1990; Pintrich & Schrauben 1994), we propose that a more adequate test of the association between motivation, strategy use, and delay of gratification requires having a common, specific rating target. Therefore, the academic delay of gratification scale (ADOGS), an adaptation of the MDG scale (Ward et al. 1989), was designed to assess situationally-specific delay of gratification in a given course, rather than as general personality trait. In addition, the rationale is rather straightforward in the importance of having a common rating target for the cognitive and learning strategies that are assessed in Study 2 and ADOGS.

In summary, despite evidence that delay of gratification has been associated with more positive academic outcomes, and that students who do not control their impulses might choose non-academic instant gratification and sensation seeking, delay of gratification has not previously been systematically related to the broader self-regulatory framework that characterizes contemporary work in motivation and learning strategies, especially among college students (Pintrich & De Groot 1990; Pintrich et al. 1993; Schunk 1994, 1996; Zimmerman 1998; Zimmerman, Greenberg, & Weinstein 1994). The present studies provide that integration by examining how delay of gratification relates to the motivational and strategic antecedents of academic achievement. This required the development of a more adequate assessment of individual differences in delay of gratification in an academic context.

STUDY 1

This study was designed to develop a course-specific ADOGS with acceptable psychometric properties that could serve to test the hypothesized relationships between learning strategies, motivation, and delay of gratification in academic

contexts. The ADOGS presented a series of choices between two alternatives. Three criteria were used in the creation of items on the ADOGS. First, each item presented one immediately available alternative and another that could be obtained after a delay interval. Second, each alternative explicitly indicated, or assumed, an academic outcome if that alternative was selected. Selecting the delayed academic alternative presumably increased the probability of long-term academic success. In contrast, the competing alternative produced immediate gratification but diminished the probability of long-term academic achievement. Third, the more delayed academic alternative should be considered more valuable by the students than its competing alternative. Thus, whereas both choices offered some degree of reward, the alternatives that involved longer waiting periods for realization were assumed to be viewed by the students as more academically favorable than the alternatives that were immediately available.

METHOD

The ADOGS consists of 10 items that were developed using the above three criteria. The item content reflects a variety of students' academic experiences, such as meeting deadlines on assignments, use of the library, interpersonal relations with peers and instructors, and studying course material (see Appendix). Academic alternatives were paired with non-academic alternatives in the form of activities typically encountered in college settings, such as going to a movie or sporting event, taking a trip, having fun with friends, or skipping classes. 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, or 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." Responses were coded so that higher total scores (mean item scores—total score divided by 10—could range from 1 to 4) indicate greater delay of gratification. The ADOGS was presented to 194 undergraduate students enrolled in introductory level courses during the summer term of 1995 at a large, public Midwestern university. The students, who responded anonymously, completed the ADOGS in approximately 10 minutes during a regularly scheduled classroom period.

RESULTS

The mean for the items was 3.0 ($SD = .55$, $Range = 2.5$ to 3.4), indicating a general tendency to prefer delay of gratification, with a slight skew ($-.36$) in the direction of immediate gratification. Evidence of acceptable internal consistency is suggested by a Cronbach $\alpha = .77$ (Nunnally 1978). An examination of possible multidimensionality was conducted with a principal components factor analysis and varimax rotation. Using a root one criterion, two factors were extracted that explained 47% of the variance. With a criterion factor loading of $|.40|$, Factor 1, which accounted for 34% of the variance, consisted of six items (1, 3, 4, 5, 6, 8) that generally presented choices between academic and non-social alternative activi-

ties (e.g., missing class because of nice weather). Salient items for Factor 2, which accounted for 13% of the variance (items 2, 7, 9, 10), involved academic versus social alternatives (e.g., partying with friends). Despite evidence of multidimensionality, the level of internal consistency suggested that the use of subscales was not indicated, and thus subsequent analyses present only total scores.

STUDY 2

The ADOGS was used to test the hypothesized relationships between academic delay preferences and students' motivational tendencies and use of learning strategies. As discussed earlier, we expected that college students who choose to delay gratification would report higher motivation for learning and greater use of cognitive, metacognitive, and resource management strategies than college students who choose immediate gratification. This study also examined the association between ADOGS and existing scales that assess related constructs: deferment of gratification (Ray & Najman 1986) and impulsivity (Buss 1995). Because the ADOGS is more specifically targeted, it was expected to correlate more highly with course-specific student motivation and use of learning strategies.

It was also expected that students' expected grades and obtained final grades in the course would be positively related to their delay tendencies. Mischel, Shoda, and Peake (1988), who found that preschoolers who opted to delay gratification were more highly achieving, orally fluent, academically oriented, and socially competent during high school than were preschoolers who preferred immediate gratification. Furthermore, adolescents who delay gratification are more socially perceptive, responsible, intelligent, have higher achievement motivation, have greater insight into their own motives and behavior, and have a higher level of productivity and aspiration (Funder & Block 1989; Funder et al. 1989; Mischel et al. 1988; Mischel, Shoda, & Rodríguez 1989; Shoda, Mischel, & Peake 1990). We used the ADOGS in the present study to examine whether these relationships would also be found with college students.

METHODS

Participants and Procedure. Participants in this study were 369 college students enrolled in introductory level psychology courses at the same university as Study 1. Participants were given course credit for their participation. The sample consisted of 60% females and 40% males, who ranged in age from 17 to 44 years ($M = 19$), and were primarily in their first (75%) or second year (17%). Most (74%) were Caucasian, with 12% African American, and 4% Hispanic. The data were collected in the students' regular classroom in a 40-minute session during the eighth and ninth weeks of the semester. Confidentiality of their responses was assured. Students were asked for their permission to obtain their actual final grade in the course after the course had been completed by using their student identification numbers.

MEASURES

Students began by providing their age, ethnicity, gender, student identification number, class level, and their expected grade in the course. Expected final grade as well as obtained final grade in the course were converted to a 11-point scale ranging from E = 1 to A = 11. Students were then given the 10-item ADOGS, followed by the Motivational Strategies for Learning Questionnaire (MSLQ) that assessed their course-specific motivation and use of learning strategies (Pintrich et al. 1993). The MSLQ consisted of 81 statements in response to which students rated themselves using a 7-point scale with anchors of "not at all true of me" to "very true of me." The MSLQ has two sections: motivation and learning strategies. Motivation includes intrinsic and extrinsic goal orientation, task value, control beliefs, self-efficacy, and test anxiety. Learning strategies include cognitive strategies (e.g., rehearsal, elaboration, organization, and critical thinking), meta-cognitive strategies (e.g., planning, comprehension monitoring, and regulating), and resource management (structuring of time and study environment, effort regulation, learning with peers, and help seeking). Coding was applied so that higher scores represent higher levels of motivation and use of learning strategies.

Students next completed the DGQ using a 5-point Likert scale ("strongly agree" to "strongly disagree") that was coded with appropriate item reversals so that higher scores represent greater deferment of gratification. An example of an item is: "I enjoy a thing all the more because I have had to wait for it and plan for it." Finally, 129 participants received an adaptation of the Buss and Plomin (1984; Buss 1995) Impulsivity Scale (IS), composed of 13 statements and a 5-point Likert format with anchors of "not characteristic or typical of myself" and "very characteristic or typical of myself." The mean of the item scores was used as the index of impulsivity. A sample statement from the scale is: "I have trouble controlling my impulses."

RESULTS AND DISCUSSION

As shown in Table 1, all scales had acceptable internal consistency estimates and variability. The Cronbach α for the ADOGS was .70, similar to but somewhat lower than that obtained in Study 1. The mean score for the ADOGS was 2.8 ($SD = .47$), with single item means ranging from 2.3 to 3.2. Internal consistency estimates, means, and variances for the remaining scales and subscales are typical of those obtained in previous research (e.g., Pintrich et al. 1993).

Table 2 presents Pearson correlations between the ADOGS, DGQ, IS, and motivation and learning strategy scales of the MSLQ. As expected, the ADOGS correlated significantly with both general delay of gratification (DGQ: $r = .33, p < .01$) and impulsivity (IS: $-.22, p < .01$). To further examine the relationships between these measures of delay, we conducted a confirmatory factor analysis (by using Bentler's 1995 structural equations multivariate software [EQS]) with a model that specified correlated factors. The results indicated that the model was a very poor fit (e.g., goodness-of-fit index [GFI] = .433). The modifications suggested by EQS to improve the fit consisted primarily of adding paths between items from different scales, which suggested considerable item overlap and would not have

TABLE 1
Cronbach Alpha for the Academic Delay of Gratification Scale, Impulsivity Scale, Deferment of
Gratification Questionnaire, Motivational Strategies for Learning Questionnaire, with their
Descriptive Statistics for Study 2 (*n* = 369)

<i>Scales</i>	<i>Alpha</i>	<i>M</i>	<i>SD</i>
ADOGS	.70	2.8	.47
DGQ	.70	3.4	.59
IS	.63	2.7	.50
Motivation			
Intrinsic goal orientation	.68	4.8	.99
Extrinsic goal orientation	.67	5.4	1.08
Task value	.91	5.4	1.18
Internal control	.63	5.7	.94
Self-efficacy	.91	5.4	1.14
Test anxiety	.76	3.8	1.37
Learning Strategies			
Cognitive			
Rehearsal	.66	4.6	1.28
Elaboration	.70	4.6	1.05
Organization	.63	3.8	1.24
Critical thinking	.80	4.2	1.26
Metacognition	.79	4.2	.96
Resource management			
Time and study environment	.80	4.6	1.15
Effort regulation	.77	4.8	1.34
Peer learning	.69	2.9	1.45
Help seeking	.58	3.4	1.29
Expected grade		8.5	2.27
Final grade		9.6	.70

Notes: M = mean; SD = standard deviation; ADOGS = academic delay of gratification; DGQ = deferment of gratification questionnaire; IS = impulsivity scale.

resulted in substantial improvement. The confirmatory analysis by itself, therefore, would not seem to justify concluding that the ADOGS differed from the other scales. Nevertheless, the correlations between the scales are low enough to suggest that they are not redundant. This was also indicated by different degrees of association among the ADOGS, IS, DGQ, and students' motivational tendencies and use of learning strategies.

In general, ADOGS scores were significantly related to most of the components of the MSLQ in the predicted direction. With respect to motivational tendencies, greater delay preferences were significantly related to intrinsic and extrinsic motivation, the value of the course, and self-efficacy. ADOGS was also related to students' use of learning strategies: rehearsal, elaboration, organization, and critical thinking. Metacognitive strategies, which include planning, monitoring, and self-regulation, were also associated with academic delay preferences. The same was true of most resource management strategies: time and study environment, effort regulation, and help seeking. As predicted, therefore, the more that students report they would delay gratification in favor of engaging in academic tasks that would improve their chances of academic success, the more they reported using cognitive, metacognitive, and resource management strategies.

TABLE 2
Pearson Correlations Between the Academic Delay of Gratification Scale, Deferment of Gratification Questionnaire, Impulsivity Scale, and the Motivational Strategies for Learning Questionnaire for Study 2 (*n* = 369)

<i>Scales</i>	<i>ADOGS</i>	<i>DGQ</i>	<i>IS</i>	<i>EG</i>	<i>FG</i>
ADOGS		.33**	-.22**	.18**	.13*
DGQ			.33**	.10*	.08
IS				-.07	-.08
Motivation					
Intrinsic goal orientation	.32***	.11*	-.16*	.29***	.18***
Extrinsic goal orientation	.35***	.09	-.02	.28***	.17**
Task value	.30***	-.02	-.11	.42***	.32***
Internal control	.03	.10	.01	.26***	.24***
Self-efficacy	.20***	.14**	-.14	.77***	.65***
Test anxiety	.03	-.08	.08	-.23***	-.21***
Learning Strategies					
Cognitive					
Rehearsal	.42***	.14**	-.24**	.13*	.07
Elaboration	.38***	.09	-.06	.26***	.20***
Organization	.40***	.05	-.18*	.03	-.02
Critical thinking	.18**	.06	.04	.21***	.12*
Metacognition	.49***	.20***	-.20*	.21***	.15**
Resource Management					
Time and study environment	.62***	.34***	-.38**	.32***	.26***
Effort regulation	.58***	.26***	-.24**	.42***	.38***
Peer learning	.09	.01	-.02	.03	-.01
Help seeking	.14*	.01	-.03	.04	-.02

Notes: ADOGS = academic delay of gratification; DGQ = deferment of gratification questionnaire; IS = impulsivity scale; EG = expected grade; FG = final grade.

* $p < .05$; ** $p < .01$; *** $p < .001$. Correlations with the ADOGS, MSLQ, and DGQ have 369 *df*. Those with the IS have 129 *df*.

It is especially noteworthy that ADOG was highly correlated with students' reported regulation of their time and study environment ($r = .62, p < .001$) and effort ($r = .58, p < .001$). The relationship with time and study environment indicates that students who prefer to delay gratification are more likely to schedule their time and to avoid distracting environments. In the case of effort regulation, greater delay was associated with persistence in the face of difficult and uninteresting task material. ADOG was also significantly related to help seeking ($r = .14, p < .05$). Seeking help from others, such as instructors, has been highly associated with academic achievement and the facilitation of learning (Karabenick 1998; Karabenick & Knapp 1991; Nelson-Le Gall 1985; Newman 1994; Zimmerman & Martínez-Pons 1986).

The results in Table 2 also indicate that measures of impulsivity and generalized deferment of gratification (IS and DGQ) were not as highly correlated with students' motivational tendencies and use of learning strategies. This was expected given that the DGQ and the IS assessed a broader domain and were not framed for the specific course as were the scales that measured motivational tendencies and students' use of learning strategies. It should be noted that the lower correlations are not due to differential scale reliability (internal consistency) or

distribution variability (i.e., standard deviations), which are comparable across the measures.

As is shown in Table 2, ADOGS scores were significantly related to students' expected grade ($r = .18, p < .01$) and obtained final grade in the course ($r = .13, p < .05$). The DGQ was related to students' expected grades ($r = .10, p < .05$), but not to their final grades. However, students' expected and final grades were not significantly related to impulsivity as measured by the IS. Table 2 also shows that expected grade in the course was positively related to all of the motivational subscales assessed by the MSLQ (e.g., intrinsic and extrinsic motivation, task value, control of learning beliefs, and self-efficacy) and to most of the learning strategies with the exceptions of critical thinking, peer learning, and help seeking. Expected final grade was negatively associated with test anxiety ($r = -.23, p < .001$). Obtained final grade in the course was also positively related to students' motivation for learning (e.g., intrinsic and extrinsic motivation, task value, control of learning beliefs, and self-efficacy) and to most of the learning strategies with the exceptions of rehearsal, organization, peer learning, and help seeking. Obtained final grade was negatively associated with test anxiety ($r = -.21, p < .001$). These results are consistent with several previous studies using the MSLQ (e.g., Pintrich et al. 1993), suggesting that the present sample and learning context are representative of post-secondary environments.

In addition, there were gender and ethnicity relationships with delay of gratification and the use of learning strategies. With respect to gender, females reported higher levels of delay on the ADOGS ($M = 2.9$) than did males [$M = 2.7; F(1, 367) = 7.67, p < .01$], but the differences in generalized delay or impulsivity were not statistically significant. Because of the small minority group representation in the sample, ethnicity was analyzed by comparing Caucasian students with non-Caucasians (African American, Hispanic, Asian American, Native American, and others). As with delay, differences were found for the ADOG, but not the other two scales. Specifically, delay was statistically greater for non-Caucasians ($M = 2.9$) than for Caucasians [$M = 2.8; F(1, 359) = 6.11, p < .05$].

GENERAL DISCUSSION

The present studies demonstrated an extensive network of associations between ADOG and students' use of learning strategies, especially their management of time, study environment, and effort. Thus, learners who delay gratification also tend to exercise control over other aspects of their learning environment. For example, those who postpone immediate gratification, such as staying in the library the night before a test rather than partying with friends, are also more likely to arrange their study schedule, structure the physical characteristics of their study environment, and continue to exert effort even when academic tasks are uninteresting. These relationships are consistent with the view that delay of gratification is a form of resource management, and thus a component of self-regulation (Mischel 1996; Mischel et al. 1996). In other words, delay of gratification is among the stra-

tegic tools that successful students use to accomplish academic tasks. Given that skillful learners have conditional as well as strategic knowledge (Paris, Lipson, & Wixson 1983), it is likely they would also know the conditions under which delay was most appropriate. The strategic importance of ADOG is supported by evidence in the present study that delay tendencies are correlated with academic performance.

The results are also consistent with conceptualizing delay of gratification as an outcome of the use of other volitional control strategies (García et al. 1998; Kuhl 1985; Snow et al. 1996). From this perspective, students who manage their study environment and schedule their time effectively would be better positioned to delay gratification by making it more likely that delay will be successful. For example, students who are effectively preparing for an exam by studying in a quiet, efficiently designed room, during a time that did not conflict with other demands, would be more engaged in the task and therefore more likely to resist temptations for more immediate gratification, such as watching a favorite television program. Students who orchestrate their study environment in this fashion would certainly be employing attentional control, as well as possibly emotional and motivational control (Snow et al. 1996), and other implementation strategies (Gollwitzer & Schaal 1998). Although these latter forms of volitional control strategies were not assessed in the present study, we would expect they would be correlated with ADOG. Based on the generally higher relationships between ADOG and resource management than with cognitive strategies in the present study, we would expect stronger relationships between ADOG and behavioral rather than with cognitive volitional strategies. Such studies may also be informative concerning the commonality and uniqueness of ADOG and the basic volition strategies proposed by Kuhl (1985) and Corno (1993).

The results also support the expected relationships between ADOG and academic motivation, specifically, self-efficacy, task value, and goal orientation. Thus, students who indicated they would delay gratification believed they were more likely to be successful, consider the course content more valuable and interesting, find the course content more challenging, and perform well in the course to demonstrate ability and obtain a high grade. For example, students who are highly motivated to learn would be more likely to stay in the library and postpone the immediate gratification that would be derived from having fun with friends, in order to ensure that they finished an assignment that was due the next day. The most direct interpretation of these relationships is that the greater delay by those students who are more motivationally engaged in the course is a function of the greater comparative strength of their academic versus alternative goal tendencies, which would require measuring the expectancy and value of the delay versus non-delay options. Specifically, we would expect that differences between the motivational tendencies of the delay (academic) versus non-delay alternatives would be related to delay tendencies as assessed by the ADOGS.

Development of the ADOGS provides a way to study ADOG in academic settings, and there is evidence of both reliability and construct validity. Discriminant validity is also suggested by the stronger correlations between motivational tendencies and learning strategies with the ADOGS than with the IS and DGQ. The

ADOGS was correlated with the IS and DGQ, which indicates some degree of overlap. Thus, students who delay gratification are also higher in their general ability to control their impulses and to delay gratification in a variety of domains (Buss 1995; Ray & Najman 1986). However, these correlations between the ADOGS and the IS and DGQ were not very high, indicating again that the ADOGS has additional predictive significance beyond these generalized tendencies. Other scale-related issues should be considered, such as generalizability by administering the ADOGS to individuals more than once in a given course and in different courses to determine the stability of ADOG over time and different academic situations.

As a self-report measure, the ADOGS is susceptible to social desirability, but more important perhaps is whether participants would actually select their stated preferences on the ADOGS. The latter would require observational or experimental validity studies in which students were confronted with the options between which participants were asked to choose. In addition, of course, the convenience of college students limits the degree of generalizability to other populations (e.g., older adults or non-college students). We should also acknowledge that by presenting students with a choice between two options, the ADOGS may not include the complete array of alternatives that are sometimes available to students. Indeed, Pervin (1983; 1996) posits that choice often involves more than two alternatives or a combination of goals. To illustrate, students who have chosen between missing several classes to accept an invitation for a very interesting trip or delay going on the trip until the course is over, may think of an alternative choice, such as asking the instructor for an extension of any missing work. Subsequent scale modifications could take such multiple option possibilities into consideration. In addition to the number of options and goals, it would be important to examine relationships between ADOG and types of goals, such as students' mastery and performance achievement goals (e.g., Ames & Archer 1988; Dweck & Leggett 1988; Nicholls, Cheung, Lauer, & Patashnick 1989; Pintrich, Zusho, Schiefele, & Pekrun 1998). Especially interesting would be to examine the distinction between approach and avoidance performance goals, that is, demonstrating ability versus avoiding the discovery of lack of ability (e.g., Elliot & Sheldon 1997; Middleton & Midgley 1997; Skaalvik 1997).

Evidence that females were higher in delay of gratification than were males, and that non-Caucasians were higher than Caucasians points to the need for replication. It would be interesting to determine whether these patterns are consistent across samples as well as the determinants of such differences. A replication of these findings, in particular those related to ethnicity, would be important given the conflicting findings related to this issue that are in the literature (Ward, Banks, & Wilson 1991), in which some studies found higher delay among non-Caucasians than Caucasians, whereas other studies report the opposite.

In summary, these studies support the conclusion that delay of gratification, as assessed by the ADOGS, provides useful information about students' academic delay of gratification behavior as they pursue academic goals. We found that the ADOGS has acceptable psychometric properties and found support for the hypothesized association between ADOG and students' use of self-regulatory strate-

gies, which consisted of academic motivation and the use of cognitive, metacognitive, and resource management learning strategies. Thus, there appears to be evidence both that ADOG is a learning strategy used by students to enact academic goals and a consequence of students' use of other volitional strategies. The results raise several issues that are suggested for further research.

ACKNOWLEDGMENTS: This article is based in part on a masters thesis in psychology submitted to Eastern Michigan University by Dr. Bembenutty. Portions of this research were presented at the Annual Convention of the Eastern Psychological Association, Philadelphia, PA, 1996. We are grateful to John R. Knapp, Barbara E. Brackney, Wilbert J. McKeachie, Barry J. Zimmerman, Paul R. Pintrich, Yi-Guang Lin, and Marita Inglehart for their helpful suggestions during the development of this research project.

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APPENDIX

ACADEMIC DELAY OF GRATIFICATION SCALE (ADOGS)

Below is a series of choices between two alternative courses of action. Please read each set of statements carefully, and relate each statement to this (introductory psychology) course. Then tell which course of action you would be more likely to choose and the strength of that choice. There are no right or wrong answers. Please respond with your true beliefs rather than the way you think you should respond. That is, tell us what you really would do under the conditions described in the statements. Do this by placing an "x" in front of that choice using the scale below:

☐ Definitely choose A ☐ Probably choose A ☐ Probably choose B ☐ Definitely choose B*

1. A. 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, OR
B. Stay home and study to increase your chances of getting a higher grade.
2. A. Study a little every day for an exam in this course and spend less time with your friends, OR
B. Spend more time with your friends and cram just before the test.
3. A. Miss several classes to accept an invitation for a very interesting trip, OR
B. Delay going on the trip until the course is over.
4. A. Go to a party the night before a test for this course and study only if you have time, OR
B. Study first and party only if you have time.
5. A. Spend most of your time studying just the interesting material in this course even though it may mean not doing so well, OR
B. Study all the material that is assigned to increase your chances of doing well in the course.
6. A. Skip this class when the weather is nice and try to get the notes from somebody later, OR
B. Attend class to make certain that you do not miss something even though the weather is nice outside.
7. A. Stay in the library to make certain that you finish an assignment in this course that is due the next day, OR
B. Leave to have fun with your friends and try to complete it when you get home later that night.

8. A. Study for this course in a place with a lot of pleasant distractions, *OR*
B. Study in a place where there are fewer distractions to increase the likelihood that you will learn the material.
9. A. Leave right after class to do something you like even though it means possibly not understanding that material for the exam, *OR*
B. Stay after class to ask your instructor to clarify some material for an exam that you do not understand.
10. A. Select an instructor for this course who is fun even though he/she does not do a good job covering the course material, *OR*
B. Select an instructor for this course who is not as much fun but who does a good job covering the course material.

*Note: This response scale follows each question.