From self-theories of intelligence to academic delay of gratification: The mediating role of achievement goals[1]

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ABSTRACT

This study examined the relationships among implicit self-theories, achievement goals, and academic delay of gratification. Do achievement goals mediate the relationship between implicit self-theories and academic delay of gratification? A sample of 195 Omani high school students rated themselves on three measures tapping these constructs. A path analysis showed that entity beliefs positively predicted performance-approach and performance-avoidance goals. Incremental beliefs positively predicted a mastery-approach goal. Incremental beliefs and entity beliefs positively and negatively, respectively, predicted academic delay of gratification. A mastery-approach positively predicted academic delay of gratification. Mastery-avoidance, performance-approach, and performance-avoidance negatively predicted academic delay of gratification.

Key words: Academic delay of gratification; implicit self-theories; achievement goals, academic achievement, Omani high school students

INTRODUCTION

Walter Mischel and his colleagues developed a method to examine children's willpower. A researcher told young children that they would receive a treat such as a cookie. Individual children who could wait to receive the treat until the researcher returned to the room after finishing a task would be given two cookies. However, each of the children could also choose to ring a bell to call the researcher back to the room at any time, in which case they would receive one cookie. Once children understood the situation, they were left alone in the room until the researcher was signaled or returned (usually after 20-25 minutes). All children initially expressed a preference to wait for the larger, later reward, but initial studies indicated that very few children were able to wait for more than a few minutes. The length of time individual children waited until ringing the bell was taken as a measure of their ability to delay gratification. As such, delay gratification involves forgoing an attractive, immediately obtainable goal (get one cookie immediately) in order to pursue long-range objectives (wait for few minutes and get two cookies) (Mischel, 1996; Mischel & Ayduk, 2004).

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Delay of gratification applies within academic contexts because it is possible that increasing the chances of accomplishing academic objectives that require extended time and effort (for example, performing well on an examination) often means foregoing the reward of a more immediately available attractive activity or outcome (for example, going out with friends). Bembenutty and Karabenick (1998, p. 329) defined academic delay of gratification as "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."

Academic delay of gratification has commonly been conceptualized as involving success of self-regulated learning (Bembenutty & Karabenick, 2004). Self-regulated learning refers to an "active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (Pintrich, 2000, p. 453). Successful self-regulators engage in academic delay of gratification by deferring attractive activities (for example, going to a party with friends) in order to achieve long-term goals for example, studying for an examination). In contrast, less successful self-regulators engage in immediate gratification that could preclude academic success (Bembenutty, 2007, 2009).

Zimmerman (1998, p. 6) argued that less-skilled self-regulated learners "must generate extraordinary personal motivation to delay gratification until distal goals are achieved." Similarly, Mischel (1996) conceptualized the ability to delay gratification as part of the self-regulatory system necessary to guide behaviour without external controlling stimuli. He argued that the ability to delay gratification is a process of self-regulatory system of willpower that orchestrates maintenance of motivation and engagement in goals.

In line with these notions, it should be possible to predict academic delay of gratification using variables implicated in models of self-regulation applied to learning. Two variables emphasized in the models of self-regulated learning are implicit self-theories and achievement goal orientations.

Implicit self-theories and achievement goals

An important variable associated with motivation and learning is the extent to which personal attributes, such as ability, are viewed as fixed or malleable (Dweck, 1999; Dweck, Chui, & Hong, 1995). Endorsement of an entity theory means that attributes are perceived as relatively stable and unchangeable. Endorsement of an incremental theory means that attributes are viewed as malleable and open to influence and change. Theory and evidence suggest that adoption of an incremental view, relative to an entity view, is associated with more adaptive cognitive and behavioral consequences, including greater effort and persistence when confronted with adversity (Dweck et al., 1995).

Achievement goals have been defined as "the purpose for which a person engages in achievement behavior" and also as "a network or integrated pattern of variables that together create an orientation toward achievement tasks" (Elliot & Thrash, 2001, p. 140). The achievement goal framework posits that people differ in the extent to which they adopt various goals concerning their achievement behaviour and that these differences are associated with distinctive emotional, motivational, cognitive, and behavioral outcomes (for example, Pintrich, 2000). Elliot and McGregor (2001) conceptualized a 2×2 achievement goal framework involving four goal orientations: The mastery-approach orientation involves striving to learn all there is to learn; the mastery-avoidance orientation involves avoiding failing to learn what there is to learn; the performance-approach orientation involves seeking to perform better than others; and the performance-avoidance orientation involves avoiding poor performance relative to others.

Students may adopt multiple goal orientations simultaneously (Pintrich, 2000); as such, the degree to which each orientation is adopted is often the focus of measurement (e.g., Elliot &

McGregor, 2001). Studies examining associations between goal orientation scores and indices of achievement-related functioning suggested that approach-oriented goals are associated with a more adaptive profile of functioning than avoidance-oriented goals (Moller & Elliot, 2006).

Dweck and her colleagues (Dweck, 1999; Dweck et al., 1995; Dweck & Leggett, 1988) posited that entity beliefs promote the adoption of performance-related goals (that is, goals concerned with demonstrating one's fixed level of competence) whereas incremental beliefs promote the adoption of mastery-approach goals (that is, goals concerned with developing one's alterable level of competence). Three studies have examined all four goal orientations in relation to entity and incremental theories. Elliot and McGregor (2001, Study 3) demonstrated that a mastery-avoidance goal orientation was positively associated with entity beliefs and negatively associated with incremental beliefs. In contrast, Cury, Elliot, Da Fonseca, and Moller (2006) showed that incremental beliefs correlated positively with mastery-approach and mastery-avoidance goal orientations whereas entity beliefs correlated positively with performance-approach and performance-avoidance goal orientations. Howell and Buro (2009) reported that entity beliefs correlated negatively with a mastery-approach goal orientation and positively with mastery-avoidance, performance-approach, and performance-avoidance goal orientations. Incremental beliefs correlated negatively with a performance-avoidance goal orientation but were uncorrelated with the remaining goal orientations.

Implicit self-theories, achievement goal orientations, and academic delay of gratification

Given that approach goals tend to be associated with adaptive self-regulatory processes whereas avoidance goals tend to be associated with maladaptive self-regulatory processes (Moller & Elliot, 2006), academic delay of gratification should be associated more with the former than the latter. To examine this notion, Bembenutty (1999) used a hierarchical cluster analysis procedure to classify a sample of college students according to their achievement goals. Cluster 1 consisted of students with a performance-avoidance goal. Cluster 2 consisted of students with a task/mastery goal. Cluster 3 consisted of students with a performance-approach goal. An examination of mean differences showed that students in Cluster 2 had greater preference for academic delay of gratification, followed by students in Cluster 3, and finally students in Cluster 1. For the entire sample of the study, academic delay of gratification correlated positively with the task goal but not with performance-approach or performance-avoidance goals. The correlation between task-goal and academic delay of gratification did not vary across the three clusters of students although this relationship was not significant for students in Cluster 1. The relationship between academic delay of gratification and a performance-approach goal was significant only for students in Cluster 3. However, the relationship between academic delay of gratification and a performance-avoidance goal was not significant for students in the three clusters. More recently, King and Du (2011) reported that academic delay of gratification correlated positively with a mastery-approach goal but not with performance-approach or performance-avoidance goals.

There is no evidence for research on the relationship between implicit self-theories and academic delay of gratification. A search of the PsycInfo, PsycARTICLES, and Psychology and Behavioral Sciences Collection databases using different combinations of the keywords "incremental beliefs, entity beliefs, self-theories, implicit theories of intelligence, and delay of gratification" resulted in no study. Howell and Buro (2009, p .154) suggested that future research "…may help to situate future time orientation and academic delay of gratification, along with implicit theories, goal orientations, and other variables involved in self-regulated learning."

The present study

Previous studies have investigated implicit self-theories and academic delay of gratification in relation to achievement goal orientations. However, these studies have failed to incorporate all these variables in a path analysis model when examining achievement goals. The integration of these variables in a path analysis model should allow the examination of the net or independent causal effect of each variable on achievement goals as well as the causal directions among these variables. For example, we know little about how students' perception of their personal attributes as fixed or malleable may contribute to their tendencies to delay gratification within an academic context and whether this relationship, if it exists, involves direct or indirect effects. This last notion is consistent with the argument put forward by Dweck and her colleagues (Dweck, 1999; Dweck et al., 1995; Dweck & Leggett, 1988) and also Howell and Buro (2009).

That is, different implicit self-theories may exert an indirect effect on achievement related outcomes by evoking specific adoption of achievement goals. The adoption of specific achievement goals may in turn serve as a direct predictor of achievement related outcomes. That is, individuals' implicit self-theories are presumed to evoke various desires and concerns that are channeled in a specific direction through the adoption of achievement goals. The goals individuals adopt are used in daily self-regulation and, therefore, are likely to affect the way the person thinks, feels, and performs. We view implicit self-theories as exerting an indirect, distal effect on academic delay of gratification - as an achievement outcome - through their influence on the adoption of achievement goals. These goals are presumed to be the direct, proximal predictors of academic delay of gratification.

Hypotheses

Path analysis hypotheses

It was hypothesized that entity beliefs would positively predict performance-approach and performance-avoidance goals and that incremental beliefs would positively predict a mastery-approach goal (Cury et al., 2006). It was hypothesized that incremental beliefs would positively predict academic delay of gratification because the adoption of incremental beliefs have been found to encourage persistence in face of difficulties, willingness to exert effort, employing of effective problem-solving strategies, and high levels of aspiration. It was hypothesized that entity beliefs would negatively predict academic delay of gratification because entity beliefs have been found to promote helplessness, self-handicapping, and unhealthy feelings of stress, shame, anxiety, and uncertainty about academic performance (Abd-El-Fattah, 2007; Dweck, 1991, 1999).

It was hypothesized that a mastery-approach goal would positively predict academic delay of gratification because mastery-approach learners seek challenging tasks, are self-efficacious, and have intrinsic motivation for task engagement. In contrast, it was hypothesized that a performance-approach goal would negatively predict academic delay of gratification because performance-approach learners are less willing to take risks, choose easy tasks, and avoid failure (Bembenutty, 1999; Dweck, 1999). Likewise, it was hypothesized that a performance-avoidance goal would negatively predict academic delay of gratification because performance-avoidance learners tend to avoid task engagement and effort (Elliot & McGregor, 2001).

Mediation hypotheses

Students who strongly endorse an entity belief of intelligence are more likely to adopt goals which define competence normatively (such as performance-approach and performance-avoidance goals) because they are concerned with showing they are smart (Dweck, 1999; Dweck,

et al., 1995). Because academic delay of gratification has been conceptualized as involving successful self-regulated learning (Bembenutty, 1999; Bembenutty & Chen, 2005), performance-approach and performance-avoidance goals should negatively predict academic delay of gratification, therefore mediate the relationship between an entity belief of intelligence and academic delay of gratification (*mediation hypothesis 1*).

Students who strongly endorse an incremental belief of intelligence are more likely to adopt goals which define competence in an absolute and intrapersonal way such as mastery-approach goals because they are concerned with getting smarter (Dweck, 1999; Dweck et al., 1995). Because academic delay of gratification tended to be associated with adaptive self-regulated learning processes (Bembenutty, 1999; Bembenutty & Chen, 2005), mastery-approach goals should positively predict academic delay of gratification, and therefore mediate the relationship between an incremental belief of intelligence and academic delay of gratification (*mediation hypothesis 2*).

METHODS

Participants

Subjects of the study were 195 students enrolled in Year 11 in four public schools within metropolitan areas in Muscat governorate in Sultanate of Oman. All schools were single gender (2 female schools and 2 male schools). There were 110 males and 85 females with ages ranging from 16 to 17 years (mean = 16.4 years, SD = 1.4). Students were from the same ethnic background and 97% of students were from a working class background.

Measurements

Implicit self-theories

Abd-El-Fattah and Yates (2006) developed the Implicit Theories of Intelligence Scale (ITIS) in Arabic using a sample of Egyptian university students. The ITIS consisted of 14 items intended to measure students' perception of their intelligence as a fixed uncontrollable trait (that is, entity theory) that cannot be changed through effort, or a malleable controllable quality that can be increased and improved through effort and investment (that is, incremental theory). It was intended that seven items reflected an entity theory (for example, "*You are born with a fixed amount of intelligence.*"), and seven items reflected incremental theory (for example, " Y*ou can develop your intelligence if you really try.*") Students rated their agreement or disagreement per item on a 4-point Likert type scale that ranged from 1 (*Strongly disagree*) to 4 (*Strongly agree*).

An exploratory factor analysis with oblique rotation of responses of the sample of the present study yielded two factors. The first factor accounted for 32% of the variance and comprised the six entity beliefs items (eigenvalue = 3.1). The second factor accounted for 28% of the variance and comprised the seven incremental beliefs items (eigenvalue = 3.8). One item loaded at .22 on the entity beliefs factor ("*Good performance in a task is a way of showing others that you are intelligent*"). This item was discarded based on a rule of thumb to retain items with loading above .30 on their designated factor (Nunnally & Bernstein, 1994). Item loadings on the entity beliefs factor ranged from .55 to .76 whereas item loadings on the incremental beliefs factor ranged from .53 to .73. Table 1 shows item loadings on entity beliefs and incremental beliefs factors.

Table 1: Item loading on entity beliefs and incremental beliefs subscales

Statements	Entity beliefs	Incremental beliefs
1. When you exert a lot of effort, you show that you are not intelligent.	.76	
2. You have a certain amount of intelligence and you cannot do much to change it.	.72	
3. You are born with a fixed amount of intelligence.	.65	
4. Difficulties and challenges prevent you from developing your intelligence.	.62	
5. Your abilities are determined by how intelligent you are	.58	
6. If you fail in a task, you question your intelligence.	.55	
7. You can develop your intelligence if you really try.		.73
8. The effort you exert improves your intelligence.		.70
9. When you learn news things, your basic intelligence improves.		.67
10. Performing a task successfully can help develop your intelligence.		.63
11. If you fail in a task, you still trust your intelligence.		.59
12. Good preparation before performing a task is a way to develop your intelligence.		.55
13. Criticism from others can help develop your intelligence.		.53

Note. $N = 195$.

Achievement goals

Alkharusi and Aldgafri (2010) adapted Elliot and Murayama's (2008) Achievement Goal Questionnaire-Revised (AGQ-R) to the Omani context using a sample of undergraduate teacher education students. The AGQ-R consisted of 12 items distributed equally on four factors: (a) mastery-approach goal (e.g., *My aim is to completely master the material presented in a class*", (b) mastery-avoidance goal (e.g., *My aim is to avoid learning less than I possibly could*"), (c) performance-approach goal (e.g., " *My aim is to perform well relative to other students*"), and (d) performance-avoidance goal (e.g., " *My aim is to avoid doing worse than other students*"). Students responded to each item on a 5-point Likert type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

Academic delay of gratification

The Academic Delay of Gratification Scale (ADOGS, Bembenutty & Karabenick, 1998) is a 10-item scale that solicits students' preference for an immediately available attractive option versus a delayed academic alternative. For each item, the students first rated their preference for an option that offered immediate gratification such as "*Miss several classes to accept an invitation for a very interesting trip*" or a delay gratification option such as "*Delay going on the trip until the course is over.*" Students responded to each item on a 4-point scale: 1 "*Definitely Choose A,*" 2 "*Probably Choose A,*" 3 "*Probably Choose B,*" and 4 "*Definitely Choose B*". The author translated the ADOGS from English into Arabic using the back-translation method. Three qualified translators, working without reference to the English version of the ADOGS, independently translated the Arabic version back to English. Other three qualified translators independently compared the original English version of the ADOGS to the new English version that was translated back from Arabic, and any discrepancies were noted. This iterative process of translation and back-translation continued until no semantic differences were noticed between both questionnaire forms (Maneesriwongul & Dixon, 2004). An exploratory factor analysis of responses of the sample of the present study yielded a single factor with 10 items that accounted for 58% of the total variance (eigenvalue = 4.3). Item loadings on this factor ranged from .52 to .75. Table 2 shows item loadings on the academic delay of gratification factor.

Procedure

Students were recruited to participate in the study during their normal classes at their schools. Students were informed that participation was voluntary and that confidentiality of their answers would prevail. All students gave assent by signing a consent form prior to their participation in the study. The instruments were administered by the researcher according to standardized instructions. The rating scales were first explained and a sample item was presented. Students were then asked to complete the instruments on their own and to return the completed instrument to the instructor at the end of class. Only certain classes participated in the present study depending on students' classroom schedules on the day and time of the administration of the instruments. Students responded to all instruments in 15-25 minutes.

Table 2: Factor loadings for the Academic Delay of Gratification Scale

Statements	Academic delay of gratification
1. 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.	.75
2. 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.	.73
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.	.71
4. 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.	.68
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.	.66
6. 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.	.65
7. 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.	.63
8. 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.	.60
9. 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.	.57
10. 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.	.52

Note. $N = 195$.

RESULTS

Descriptive statistics and correlational analyses

Means, standard deviations, Cronbach's alpha, skewness, kurtosis, and Pearson's correlation coefficients among all variables of the present study are summarized in Table 3. Based on analyses conducted using the DeCarlo (1997) macro, there were no statistically significant multivariate outliers. Tolerance values suggested that there was no statistically significant multicollinearity in the data. The data appear normally distributed as assessed by examining skewness and kurtosis values for each variable. According to Finney and DiStefano (2006), absolute values of skewness and kurtosis larger than 2 and 7, respectively, may imply a lack of univariate normality. An examination of mean differences showed that females had higher levels of academic delay of gratification than males (Females, M = 30.24, SD = 2.64; Males, M = 28.12, SD = 2.94, t (193) = 5.29; Effect size (d) = .76). Effect size values of 0.2, 0.5, and 0.8 were considered small, medium, and large effects, respectively (Cohen, 1988). No other gender differences were detected for other variables of this study.

Table 3: Descriptive statistics, Pearson's correlation, and Cronbach's alpha for all variables

Variable	1	2	3	4	5	6	7
1. Entity beliefs	-						
2. Incremental beliefs	.29**	-					
3. Mastery-approach	- .12	.32**	-				
4. Mastery-avoidance	.11	.09	.26*	-			
5. Performance-approach	.31**	.11	.28*	.27*	-		
6. Performance-avoidance	.35**	- .22*	- .24*	.09	.07	-	
7. Academic delay of gratification	- .33**	.37*	.30**	.13	- .30	- .35**	-
Number of items	6	7	3	3	3	3	10
M	2.44	3.11	3.22	2.89	3.10	2.76	3.30
SD	1.16	1.13	1.24	1.29	1.30	1.10	1.22
Skewness	.85	.72	.92	-.55	.79	- .47	.72
Kurtosis	.71	.40	.62	.47	.39	-.44	.30
Cronbach's alpha	.83	.81	.77	.75	.73	.71	.87

Note. N =195, * p < .05 **p < .001

Path analysis

In a path analysis model, using structural equation modeling (Bollen, 1989; Kline, 2005), implicit self-theories were set as predictors of achievement goals and academic delay of gratification, and achievement goals were set as predictors of academic delay of gratification. Given that descriptive statistics demonstrated that the data were normally distributed, full information maximum likelihood estimation was used to analyze the variance-covariance matrix and estimate model parameters and obtain fit indices (Bollen, 1989). The AMOS 7.0 program (Arbuckle, 2006) was used to run the analysis.

Several absolute and relative goodness-of-fit indexes were used to evaluate the path model's goodness-of-fit to the data. Absolute fit indices included Chi-square (χ^2), Standardized Root

Mean-Square Residual (SRMR), and Root-Mean-Square Error of Approximation (RMSEA). Relative fit indices included Comparative Fit Index (CFI) and Nonnormed Fit Index (NNFI). When modeling normally distributed data, SRMR values of approximately .08 or below, RMSEA values of approximately .06 or below, CFI values of approximately .95 or above, and NNFI of approximately .95 or higher suggest adequate model-data fit (Byrne, 2009; Hu & Bentler, 1998). Because the χ^2 is sensitive to sample size, Hoelter (1983) recommended reporting the χ^2/df ratio and suggested that ratios below 2.0 indicate a reasonable fit.

The analysis showed that the path model fitted the data adequately ($\chi^2 = 38.9$, df = 18; χ^2/df = 1.9, RMSEA = .04 (CI. .027 - .053), CFI = .98, SRMR = .06, NNFI = .96). The full set of significant paths is presented in Figure 1 along with the associated variance explained (R^2) for each criterion variable. The analysis showed that entity beliefs positively predicted performance-approach and performance-avoidance goals. Incremental beliefs positively predicted a mastery-approach goal. Incremental beliefs and entity beliefs positively and negatively, respectively, predicted academic delay of gratification. Mastery-approach positively predicted academic delay of gratification. Mastery-avoidance, performance-approach, and performance avoidance goals negatively predicted academic delay of gratification.
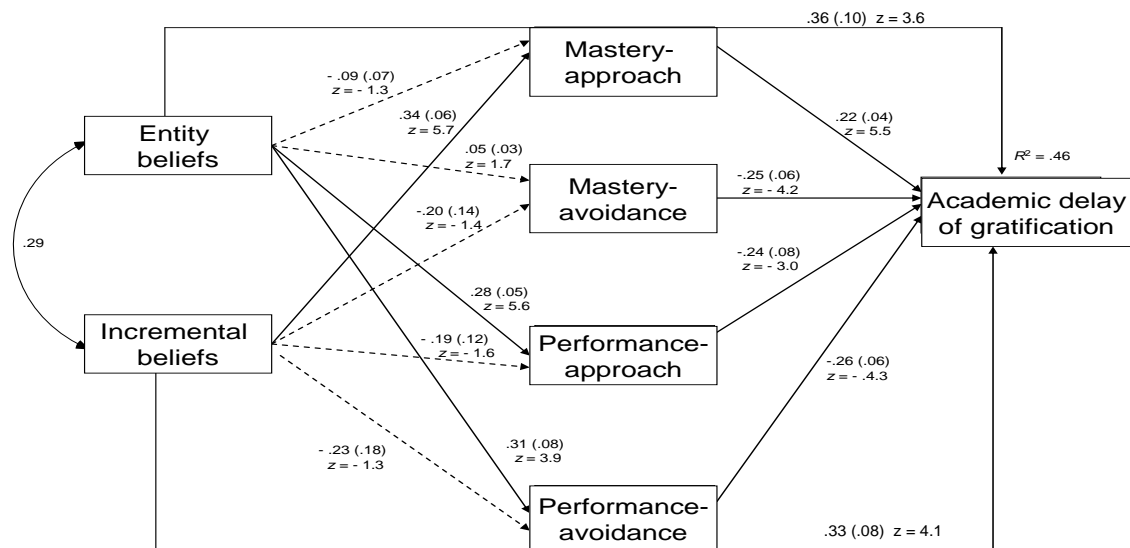

Figure 1 A path model of the relationship among implicit self-theories, achievement goals, and academic delay of gratification

Multiple mediation analysis

The aim of the multiple mediation analysis was to test whether achievement goal orientations mediated the relationship between implicit self-theories and academic delay of gratification. It was hypothesized that both entity beliefs and incremental beliefs would affect these achievement goal orientations which in turn would affect academic delay of gratification.

A multiple mediation analysis tests simultaneous mediation by multiple variables (Lockwood & MacKinnon, 1998). In practice, testing a multiple mediation model involves (a) investigating the total indirect effect to decide whether the set of mediators transmits the effect of the independent variable(s) to the dependent variable(s), and (b) investigating the specific indirect effect associated with each putative mediator. Either or both types of effect may be of theoretical interest and worth investigating because it is possible to find specific indirect effects to be

significant in the presence of a non-significant total indirect effect due to a suppression effect (Preacher & Hayes, 2008).

In the present study, the multiple mediation analysis was conducted using the SPSS script that accompanies the paper by Preacher and Hayes (2008) on testing multiple mediation models. Standard regression coefficients and bootstrapped estimates of the indirect effect, along with bias-corrected 95% confidence intervals, were calculated. With bootstrapping, the indirect effect is estimated based on a large number of bootstrap samples generated from the original data by random sampling with replacement. This study used 1,000 bootstrap samples to allow convergent of the indirect effects estimates. If the 95% confidence interval (CI) for the estimates of the indirect effect does not include zero, it suggests the significance of the mediation effect at the .05 level (Preacher & Hayes, 2008). The results of the multiple mediation analyses are presented in Table 4.

Table 4: Indirect and total effects of implicit self-theories on academic delay of gratification through achievement goal orientations

Paths	Bootstrapping estimate	BCA 95% CI	
		Lower bound	Upper bound
From entity beliefs to academic delay of gratification			
Performance-approach	.32**	.26	.37
Performance-avoidance	.29**	.23	.34
Mastery-approach	- .07	- .12	.04
Mastery-avoidance	.09	- .04	.16
Total indirect effects	.63**	.57	.69
From incremental beliefs to academic delay of gratification			
Performance-approach	.05	- .07	.13
Performance-avoidance	- .09	- .17	.04
Mastery-approach	.30**	.25	.36
Mastery-avoidance	- .09	- .15	.03
Total indirect effects	.17	- .06	.29

Note. $N = 195$; BCA = bias corrected and accelerated. CI= confidence interval. **significant indirect effects ($p < .01$)

In the first step of the analysis, academic delay of gratification was regressed on the four achievement goal orientations which were regressed simultaneously on entity beliefs. Gender and incremental beliefs were set as covariates. The analysis showed a significant total indirect effect of entity beliefs on academic delay of gratification through achievement goal orientations (BCA 95% CI lower = .57, BCA 95% CI upper = .69). The analysis proceeded to investigate the significance of the specific indirect effects associated with the four achievement goal orientations. In all analyses, gender and incremental beliefs were set as covariates. In each analysis, the indirect effect of entity beliefs on academic delay of gratification through one of the four achievement goal orientations was tested, controlling for the indirect effect of the other three achievement goal orientations.

The analysis showed a significant indirect effect of entity beliefs on academic delay of gratification through performance-approach (BCA 95% CI lower = .26, BCA 95% CI upper = .37) and performance-avoidance (BCA 95% CI lower = .23, BCA 95% CI upper = .34) goal orientations only. This means that performance-approach and performance-avoidance goal orientations mediated the relationship between entity beliefs and academic delay of gratification.

In the second step of the analysis, academic delay of gratification was regressed on the four achievement goal orientations which were regressed simultaneously on incremental beliefs. Gender and entity beliefs were set as covariates. The analysis showed that the total indirect effect of incremental beliefs on academic delay of gratification through achievement goal orientations was not statistically significant (BCA 95% CI lower = - .06, BCA 95% CI upper = .29). The analysis proceeded to investigate the significance of the specific indirect effect associated with the four achievement goal orientations. In all analyses, gender and entity beliefs were set as covariates. In each analysis, the indirect effect of incremental beliefs on academic delay of gratification through one of the four achievement goal orientations was tested, controlling for the indirect effect of the other three achievement goal orientations.

The analysis showed that only the specific indirect effect of incremental beliefs on academic delay of gratification through a mastery-approach goal orientation was statistically significant (BCA 95% CI lower = .25, BCA 95% CI upper = .36). This means that a mastery-approach goal orientation mediated the relationship between incremental beliefs and academic delay of gratification.

DISCUSSION

The aim of the present study was to investigate the relationship among incremental and entity self-theories, the four achievement goal orientations comprising the 2×2 achievement goal framework, and academic delay of gratification. Descriptive analyses showed that females had higher academic delay of gratification than males. This finding is in line with gender differences in academic areas identified in a significant body of research within educational psychology (Pintrich & De Groot 1990; Zimmerman, 1998). This finding is noteworthy since it indicates that males and females can indicate differences in the way manage academic situations. However, this finding should not be interpreted as suggesting that males and females are inherently different in ways that lead them to engage in academic endeavors in a particular way. The socialization process and classroom contexts, including academic tasks, reward structures, instructional methods, and instructors' behaviors, may be associated with the patterns of behaviour reported by the students in the present study. Similar findings were reported by Bembenutty (2007 & 2009) and Bembenutty and Karabenick (1998).

In line with predictions, the analysis showed that incremental beliefs correlated positively with delay of gratification whereas entity beliefs correlated negatively with delay of gratification. These correlations indicate that incremental beliefs are more likely to encourage consideration and adoption of factors over which one has some control during completion of a challenging task (for example, effort, persistence, and emotion management) whereas entity beliefs do so to a significantly lesser extent..

Dweck and her colleagues (Dweck, 1999; Dweck et al., 1995; Dweck & Leggett, 1988) have shown that the adoption of incremental beliefs encourages persistence in face of difficulties, willingness to exert effort, employment of effective problem-solving strategies, and high levels of academic aspiration. These healthy psychological traits encouraged improvements in students' academic achievement and adjustment. In contrast, the endorsement of entity beliefs appeared to promote helplessness, self-handicapping, and unhealthy feelings of stress, shame, anxiety, and uncertainty about academic performance. These negative psychological traits were found to discourage further development in students' academic achievement and adjustment (Dweck, 1999; Dweck & Leggett, 1988).

The mastery-approach goal orientation correlated positively with academic delay of gratification whereas performance-approach and performance-avoidance goal orientations correlated negatively with it. These findings reflect the advantageous cognitive and behavioral correlates of approach-oriented goals such as higher intrinsic motivation and higher self-efficacy

associated with the mastery-approach goal orientation (Moller & Elliot, 2006). In addition, these findings support growing evidence of the benefits of the mastery-approach goal orientation and further distinguish it from the mastery-avoidance goal orientation (Moller & Elliot, 2006).

The analyses showed that entity beliefs correlated negatively with a mastery-approach goal orientation and positively with performance-approach and performance-avoidance goal orientations. In contrast, incremental beliefs correlated positively with a mastery-approach goal orientation. Despite some inconsistencies, the most stable findings concerning these relationships across the current study and prior studies (that is, Cury et al., 2006; Elliot & McGregor, 2001) are the tendency for mastery-approach goals to be positively associated with incremental beliefs (or negatively associated with entity beliefs), whereas mastery-avoidance, performance-approach, and performance-avoidance goals tend to be positively related to entity beliefs (or negatively associated with incremental beliefs).

Consistent with these findings, Dweck and her colleagues (Dweck, 1999; Dweck et al., 1995; Dweck & Leggett, 1988) have proposed a model in which individuals' implicit self-theories and goals create a motivational framework that guides their strivings prior to an outcome and creates a meaning system within which attributions occur. According to this model, an entity versus an incremental belief orients individuals to focus on different goals and on different explanations of their performance. When individuals hold an entity belief, they tend to orient more towards performance goals (that is, the goals of gaining favorable judgments and avoiding negative ones). That is, when a valuable personal attribute is seen as fixed, individuals tend to be more interested in demonstrating that they are competent in it, and concerned about avoiding a demonstration of deficiencies. Entity theorists may also explain poor performance in terms of their lack of ability, which would render them vulnerable to helpless response patterns in the face of failure.

In contrast, when individuals pursue an incremental belief, they tend to orient more towards mastery goals (that is, the goals of increasing their ability through learning). When an important personal attribute is seen as a potential that can be developed through investing more effort, individuals tend to be less concerned about "showing off" or otherwise attempting to validate their competency. When faced with failure, incremental theorists look for ways to improve such as investing more effort or engaging in remedial actions (Dweck, 1999).

Finally, the mediation analysis showed that performance-approach and performance-avoidance goal orientations mediated the relationship between entity beliefs and academic delay of gratification. Entity beliefs were associated with performance-approach and performance-avoidance goal orientations, perhaps reflecting a desire to perform better than others, and to avoid poor performance relative to others, which in turn was associated with less delay of gratification. This finding indicates that stronger endorsement of entity beliefs was associated with stronger pursuit of performance-approach and performance-avoidance goal orientations which were associated with less delay of gratification.

Incremental beliefs, on the other hand, were associated with a mastery-approach goal orientation, possibly reflecting a desire to learn all there is to learn, which in turn was associated with greater delay of gratification. This finding indicates that stronger endorsement of incremental beliefs was associated with stronger pursuit of a mastery-approach goal orientation which was associated with greater delay of gratification. These findings are consistent with the view that performance-approach and performance-avoidance goal orientations are relatively maladaptive in an academic context whereas mastery-approach goal orientations are relatively adaptive (Elliot & McGregor, 2001; Moller & Elliot, 2006).

The major limitation of the present study was the cross sectional nature of the data. As a result, definitive conclusions about the relationship among implicit self-theories, achievement goal orientations, and academic delay of gratification cannot be drawn. A different method for understanding the developmental precursors to academic delay of gratification would be to examine them over time rather than at a single time point. The second limitation was the use of

self-reported measures of implicit self-theories, achievement goal orientations, and academic delay of gratification. Although self-ratings of these constructs remain the standard used by most studies, future studies should assess behaviors associated with these constructs either as observed by others or by direct observations by researchers. Until such studies are conducted, these constructs will remain largely defined as a cognitive self-construal processes rather than observable traits.

To summarize, the current findings provide further insight into the dynamics which underpin students' academic delay of gratification. It has been argued that incremental beliefs are associated with higher levels of academic delay of gratification because they encourage positive mediating factors that facilitate outcomes (Dweck et al., 1995). Incremental theorists make optimistic predictions about their likelihood of success and value completion of difficult tasks (Dweck, 1999). In contrast, entity theorists are characterized by a pattern of *temporal discount* where long-term goals may be sacrificed in the service of securing short-term, positive judgments of ability (Dweck, 1999). Entity beliefs are associated with lower levels of delay of gratification because such conceptions encourage negative mediating factors that reduce the chances of success. Entity theorists may not expect to be successful and can experience negative feelings such as boredom during academic tasks. These thoughts and feelings can reduce the perceived value of working hard (Dweck & Bempechat, 1983).

Furthermore, there is evidence in the present study that the mastery approach-oriented achievement goal indicates a high need for achievement (Moller & Elliot, 2006). Outcomes pursued with the aim of mastery become imbued with positive emotion (higher value) and a high expectation for success. Mastery-approach goals promote high self-efficacy, encourage the valuing of competence, and enhance task interest (Harackiewicz, Barron, Tauer, & Elliot, 2002). Other goal orientations are associated with fear of failure, perceived incompetence or lowered valuing of competency (Middleton, & Midgley, 1997).

Further studies could examine the relationship among implicit self-theories, achievement goal orientations, and academic delay of gratification using longitudinal research designs. Such designs would assume that growth in these processes would be the key to understanding their impact on academic delay of gratification. Finally, the role of socialization practices and cultural values in the development of gender differences in academic delay of gratification need further exploration.

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