Situational Factors and Academic Delay of Gratification

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Abstract

The present study aimed to investigate the effects of situational factors on academic delay of gratification among university students in four hypothetical academic situations that manipulated the importance of academic goals and the attractiveness of a distractor (watching a movie) as situational factors. The relationships among academic delay of gratification, the use of learning strategies, self-efficacy, and experiential time perspective was also investigated for the four hypothetical situations. In the academic delay of gratification questionnaire participants were asked she the they showed the academic delay of gratification in the four hypothetical academic situation that manipulated the importance of academic goal and the attractiveness of distractor. In addition, learning strategy scale, self-efficacy scale and experiential time perspective scale were administered. The results indicated that the academic delay of gratification is influenced by situational variable and that academic delay of gratification is associated with the experiential time perspective and the use of learning strategies in males and females, respectively.

Key words: Academic delay of gratification, learning strategy, self-efficacy, experiential time perspective, situational factors

Unfortunately, it is often impractical to translate one's desires, urges, and impulses immediately and directly into action. Often, the behaviors that would be most immediately gratifying are prohibited by a higher authority or society at large. Developing children must learn to wait for a reward that

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may be forthcoming, but often only after a delay. A key ability for persons is therefore to be capable of delaying gratification (Funder, Block & Block, 1983).

Mischel (1966, 1974) and his associate conducted research on delay of gratification in which the experimenter presented children with a larger delayed reward available later (DelR) and a smaller immediate reward available immediately (ImR) and had them choose the one they preferred.
When the child selected the DelR, it is considered that he or she had chosen to delay immediate gratification. That research indicated that the choice of a delayed reward related positively to social responsibility (Mischel, 1961 a), intelligence and achievement motive (Mischel, 1961 b), accuracy in time statements (Mischel & Metzner, 1972), and future time perspective (Klineberg, 1968).

The research described above was choice research. However, in addition to choice research, Mischel (1981) also measured how long children could wait to attain DelR while resisting the temptation of ImR. Mischel (1981) identified waiting strategies that facilitate waiting behavior. The distraction strategy distracts from rewards through the performance of an overt or covert activity (Mischel & Ebbesen, 1970; Mischel, Ebbesen & Zesis, 1972). The self-instruction strategy regulates behavior through verbal commands to the self (Miller, Weinstein & Karniol, 1978; Toner, 1981; Tonner, Bonnie & Lewis, 1979; Tonner, & Smith; 1977). The cognitive transformation strategy cognitively transforms arousing, consummatory, hot ideation (e.g., taste of reward) about the reward into symbolic representation, i.e., cool ideation (Mischel & Baker, 1975; Mischel & Moore, 1973; Mischel & Moore, 1980; Moore & Mischel, 1976).

Recently, Bembenutty (1998, 2004) proposed academic delay of gratification, defined as a student's postponement of an immediately available opportunity to satisfy an impulse in favor of academic goals that are temporally remote but ostensibly more valuable. The concept of academic delay of gratification differs from that of delay of gratification devised by Mischel (1966, 1974). First, in Mischel's (1966, 1974) delay of gratification research, waiting is necessary to obtain a larger reward. By contrast, in Bembenutty's (2004) delay of gratification research, performing an academic activity is necessary to obtain a larger reward. Second, in Mischel's (1966, 1974) delay of gratification research, a delayed reward is a substance that can be eaten (e.g., candy), whereas in Bembenutty's (1998) delay of gratification research, a delayed reward is a symbolic reward (e.g., obtaining an academic degree).

The present study focuses on academic delay of gratification. Previous research has indicated that academic delay of gratification is related to personal variables such as self-efficacy (Wlieard, Perry & Bembenutty, 2002), future time perspective (Klineberg, 1969, Doolin, 1989) and the use of learning strategies (Bembennuty & Zimmerman, 2003, Kim & Chung, 2001; Pintrich & De Groot, 1990). However, previous research has not fully investigated the influence of situational variables on academic delay of gratification.

Given this background, in the present study, to investigate the effects of goal

importance and the attractiveness of a distractor on the delay of gratification, a situation was set in which students resisted the temptation of a distractor to attain an academic goal. In setting such a situation, the importance of the academic goal and the attractiveness of a distractor (watching a movie) were used as situational variables to influence academic delay of gratification.

Previous research has reported that academic delay of gratification is related to self-efficacy (Bembenutty, 2002), the use of learning strategies (Bembenutty & Zimmerman, 2003; Kim, Chung & Kwon, 2001; Pintrich & De Goot, 1990), and future time perspective (Ward, Perry & Dooling, 1989; Klineberg, 1968). Therefore, in the present study, we focused on self-efficacy and learning strategies. We also focused on not future time perspective, but experiential time perspective (Shirai, 1994), which consists of self-fulfillment, goal-orientation, past acceptance, and hopefulness. The reason why we focused on this concept is because it includes not only the future, but also the present and past, and thus, is a broader concept about the time compared with future time perspective.

Therefore, here, we investigated whether academic delay of gratification is related to the use of learning strategies, self-efficacy, and experiential time perspective for four situations in which goal importance and the attractiveness of a distractor were manipulated. Finally, by performing a cluster analysis, we cluster the students based on their delay response for the four situations in which goal importance and the attractiveness of a distractor was manipulated. Then, we compared the use of learning strategies, self-efficacy, and experiential time perspective among the clusters.

Method

Participants

The study participants were 176 university students (71 males, mean age: 20.1 years, 105 females, mean age: 19.2 years) from the Tokai and Nagasaki districts. The university students from the Tokai district (41 males, 105 females) belonged to the school of education, while those from the Nagasaki district (30 males) belonged to the faculty of nursing and nutrition. Consent to participate in the survey was obtained from all students.

Questionnaires and scales

Academic delay of gratification questionnaire

The participants were asked whether they achieved an academic goal while resisting to the temptation to go watch a movie. We manipulated the importance of the academic goal and the attractiveness of a distractor (watching a movie) and set four hypothetical situations (Table 1). The participants responded to the four situations using a three-point scale.

Learning strategy scale

We used the learning strategy scale devised by Ito (1996). Although this scale was originally administered to junior high school students, we used it in the present study because the content and meaning of the items were also thought be true for university students. The students responded to the questionnaire items using a six-point scale.

Self-efficacy scale

We used the self-efficacy scale devised by Ito (1996), which was also administered to junior high school students. Again, the content and meaning of the items were also thought to be true for university students. The students also responded to this questionnaire using a six-point scale.

Experiential time perspective scale

Finally, we used the experiential time perspective scale devised by Shirai (1994). This scale was originally administered to university and professional school students. The students responded to this questionnaire using a five-point scale.

Results

Analysis of situational factors

We performed a 2 (sex) × 2 (goal importance) × 2 (attractiveness of a distractor) analysis of variance (ANOVA) using delay scores as the dependent variable. We assigned "go to the movie" 0 points, not sure" 1 point, and "study" 2 points. Table 2 shows the mean delay scores for each sex and condition. The main effect of sex (F (1,174) =4.14, p<.05) was significant and females had higher delay scores than did males. The main effect of goal importance (F (1,174) =153.38, p<.01) was significant, and the goal high (H) condition had higher delay scores did than the goal low (L) condition. The main effect of attractiveness of a distractor $(F$ (1,174) =161.34, p<.01) was significant, and the distractor L condition had higher delay scores than did the distractor H condition.

The interaction effect between goal importance and attractiveness of a distractor (F (1,174) =141.30, p<.01) was significant. We performed the analysis of simple main effect of importance of goal for distractor H and L conditions. The simple main effect of importance of goal was significant for the distraction H (F (1,348) =290.72, p<.01) and L $(F$ (1,348) =7.22, p<.01) conditions. Between these two conditions, the goal H condition had the higher delay scores compared to the goal L condition. The simple main effect of attractiveness of a distractor was significant for the goal H $(F$ (1, 348) =301.07, p<.01) and L (F (1,348) =5.77, p<.01) conditions. And, between these two conditions, the distractor L condition had the higher delay scores.

Scales (factor analysis)

Learning strategy scale

A difference in the factor structure might be present between the junior high school students that participated in the study by Ito (1996) and the university students that participated in the present study because the age of the participants and the content of their experiences differed substantially. Therefore, we did not adopt the subscale abstracted by Ito (1996), and we newly performed a factor analysis for the university students.

Factor analysis with promax rotation was performed for males and females. Three factors were abstracted for males and females, considering the decreased eigenvalue and the possible interpretability of the factors. Tables 3 and 4 show the results of factor analysis. The first subscale was a general cognition strategy and consisted of 11 items for males and females. The second subscale was a review summarizing strategy and consisted of three items for males and females. The third subscale was attention and consisted of four and three items for males and females, respectively.

Self-efficacy scale

Similar to the learning strategy scale, a difference in the factor structure might be present between the junior high school students that participated in the study by Ito (1996) and the university students that participated in the present study because the age of the participants and the contents of experiences differed substantially. Therefore, we again did not adopt the subscale abstracted by Ito (1996), and we newly performed a factor analysis for the university students.

Factor analysis with promax rotation was performed for males and females. The results are shown in Tables 5 and 6. One subscale was abstracted for the males and females, considering the decreased eigenvalue and the possible interpretability of the factors. The scale consisted of nine items for males and females.

Experiential time perspective scale

Unlike the situation for the above two scales, a large difference in the factor structure was not presumed to be present between the university students and professional school students that participated in the Shirai (1994) study and the university students that participated in the present study, because the age of participants and content of their experiences were similar. Thus, we adopted the subscale of Shirai (1994) and performed an analysis using an experiential time perspective scale. According to Shirai (1994), this scale consists of four subscales. The first subscale is self-fulfillment and consists of five items. The second subscale is goal-oriented and consists of five items. The third subscale is past acceptance and consists of four items. The fourth subscale is hopefulness and consists of four items.

Correlation analysis

Total scores were calculated for each subscale on the learning strategy

and experiential time perspective scales. The total self-efficacy score was also calculated. The correlation coefficients between the academic delay of gratification scores, total scores for each subscale on the learning strategy scale, total self-efficacy scores, and total scores for each subscale on the experiential time perspective scale was calculated for all four conditions under which goal importance and attractiveness of a distractor was manipulated. The results are shown in Tables 7 and 8.

In the goal L distractor H condition, for males, the experiential time perspective scale, i.e., goal-orientation, and hopefulness scores, were significantly positively related to academic delay of gratification scores. Also, self-fulfillment scores tended to be positively correlated with academic delay of gratification scores. For females, review summarizing strategy scores tended to be positively related to academic delay of gratification.

In the goal H distractor H condition, for males, no relations were found for academic delay of gratification. For females, goal-orientation and general cognition strategy scores tended to be positively related to academic delay of gratification scores.

In the goal L distractor L condition for males, self-efficacy scores and acceptance of past scores tended to be positively related to academic delay of gratification. Also, self-fulfillment scores significantly positively correlated to academic delay of gratification scores. For females, general cognition strategy scores significantly positively related to academic delay of gratification scores. Review summarizing strategy scores also tended to be positively related to academic delay of gratification.

In the goal H distractor L condition, for males, general cognition strategy, review summarizing strategy, and attention scores tended to be positively related to academic delay of gratification. For females, general cognition strategy scores significantly positively related to academic delay of gratification.

Cluster analyses

By performing hierarchical cluster analysis for each sex (Ward method, mean distance method), we clustered the students on the basis of their delay response for the four situations in which goal importance and attractiveness of a distractor were manipulated. Then, we compared the use of learning strategies, self-efficacy, and experiential time perspective among clusters for each sex. Cluster analysis abstracted three clusters for each sex, considering the possible interpretability of clusters..

For males, 25, 43, and 3 students were assigned to clusters 1, 2, and 3, respectively. As the number of students was low, we removed cluster 3. For females, 27, 70, and 8 students were assigned to clusters 1, 2, and 3, respectively. Again, as the number of students was low, we removed cluster 3.

Cluster of males

Cluster-condition ANOVA was performed to clarify the characteristics of

the cluster for males. Table 9 shows the delay scores for each condition and cluster. The main effect of cluster $(F (1,66) =118.02, p<.01)$ was significant, and cluster 1 had higher delay of gratification scores than did cluster 2. The main effect of condition $(F (3, 198) =58.65, p<.01)$ was significant. When arranging the conditions in order of the magnitude of delay scores, the results were as follows: goal H distractor L > goal H distractor H = goal L distractor L > goal L distractor H (goal H distractor L vs. goal H distractor H, $t (198) =3.38, p<.05$; goal H distractor L vs. goal L distractor L, $t (198) =2.13, p<.05$; goal H distractor L vs. goal L distractor H, $t (198) =12.71, p<.01$; goal H distractor H vs. goal L distractor H, $t (198) =9.34, p<.01$; and goal L distracter H vs. goal L distractor L, $t (198) =10.59, p<.01$).

The interaction effect between cluster and condition was significant $(F (3,198) =34.76, p<.01)$. The simple main effect of cluster was significant for goal L distractor H $(F (1,264) =192.25, p<.01)$, and cluster 1 had higher delay of gratification scores than did cluster 2. For goal L distractor L, the simple main effect of cluster was significant $(F (1,264) =5.29, p<.05)$, and cluster 1 had higher delay of gratification scores than did cluster 2. For goal H distractor H, the simple main effect of cluster was significant $(F (1,264) =28.86, p <.01)$, and cluster 1 had higher delay of gratification scores than did cluster 2.

The simple main effect of condition was analyzed for each cluster. For cluster 1, no simple main effect of condition was observed. For cluster 2, the simple main effect of condition was significant $(F (3,198) =91.50, p<.01)$. When arranging the conditions in order of the magnitude of delay scores, the results were as follows: goal H distractor L > goal L distractor L > goal H distractor H > goal L distractor H (goal H distractor L vs. goal H distractor H, $t (198) =5.39, p<.01$; goal H distractor L vs. goal L distractor L, $t (198) =2.58, p<.01$; goal H distractor L vs. goal L distractor H, $t (198) =17.80, p<.01$; goal H distractor H vs. goal L distractor H, $t (198) =12.42, p<.01$; goal L distractor L vs. goal L distractor H, $t (198) =15.23, p<.01$; and goal L distractor L vs. goal H vs. distractor H, $t (198) =2.81, p<.01$).

Therefore, in cluster 1, no changes were seen in delay scores by situation, and the delay scores were basically high, so this was referred to as the high delay cluster. In cluster 2, changes were seen in delay scores by situation as follows: goal H distractor L > goal L distractor L > goal H distractor H > goal L distractor H. Thus, we referred to cluster 2 as the changing cluster.

Cluster of females

Cluster-condition ANOVA was performed to clarify the characteristics of the cluster for females. Table 10 shows the delay scores for each cluster and condition. The main effect of cluster was significant $(F (1,95) =146.59, p<.01)$. Cluster 1 had higher delay of gratification scores than did cluster 2. The main effect of condition was significant $(F (3,285) =96.84, p<.01)$. When arranging the conditions in order of the magnitude of delay scores, the results were as follows: goal H distractor L = goal H distractor H > goal L distractor L > goal L distractor H (goal L distractor L vs. goal L distractor H, $t (285) =13.65, p<.01$; goal H distractor L vs. goal L distractor H, $t (285) =16.67, p<.01$; goal H distractor L vs.

goal L distractor L, t (285) =3.00, p<.01; goal L distractor H vs. goal H distractor H, t (285) =15.64, p<.01; and goal L distractor L vs. goal H distractor H, t (285) =1.98 p<.05).

The interaction effect between cluster and condition was significant *(F* (3,285) =98.83, p<.01). The simple main effect of cluster was analyzed for all four conditions. For goal L distraction H (*F (1*,380) =436.61, p<.01), cluster 1 had higher delay of gratification scores than did cluster 2. For goal L distraction L (*F* (1,380) =7.98, p<.01), cluster 1 had higher delay of gratification scores than did cluster 2.

The simple main effect of condition was also analyzed for each cluster. No simple main effect of condition was observed for cluster 1, but a simple main effect of condition was observed for cluster 2 *(F* (3,285) =195.55, p<.01). For cluster 2, when arranging the conditions in order of the magnitude of delay scores, the results were as follows: goal H distractor L > goal H distractor H > goal L distractor L > goal L distractor H (goal H distractor L vs. goal H distractor H, t (285) =1.74, p<.05<p<.10; goal H distractor L vs. goal L distractor L, t (285) =4.47, p<.01; goal H distractor L vs. goal L distractor H, t (285) =28.32, p<.01; goal H distractor H vs. goal L distractor L, t (285) =2.73, p<.01; goal H distractor H vs. goal L distractor H, t (285) =6.58, p<.01; and goal L distractor L vs. goal L distractor H, t (285) =23.84, p<.01).

Therefore, in cluster 1, no changes were seen in delay scores by situation, and the delay scores were basically high, so this was referred to as the high delay cluster. In cluster 2, changes were seen in delay scores by situation as follows: goal H distractor L > goal H distractor H > goal L distractor L > goal L distractor H. Thus, we referred to cluster 2 as the changing cluster.

Comparison of self-efficacy, experiential time perspective, and use of learning strategies among clusters

Tables 11 and 12 show the results of comparisons of total self-efficacy scores, total scores for each subscale on the experiential time perspective scale, and total scores for each subscale on the learning strategy scale among clusters for each sex. In a t test, cluster was used as the independent variable for males. Goal-oriented scores was significantly higher for the high delay cluster than for the changing cluster (goal-oriented: t (66) =2.38, p<.05), and hopefulness scores tended to be higher for the high delay cluster than for the changing cluster (hopefulness: t (66) =1.85, .05<p<.10). Cluster was also used as the independent variable in a t test for females. Review summarizing strategy scores tended to be higher for the high delay cluster than for the changing cluster (t (95) =1.84, .05<p<.10).

Discussion

In the present study, females were found to have higher academic delay of gratification scores than males. This result is not consistent with the results of past research Ogawauchi, Ryu, Mitsutomi & Otsuka, 2013). Japan has a culture of self-restraint. In

their childhood, girls in particular are taught to exercise restraint and regulate their behavior more so than are boys (Kashiwagi, 1988). Thus, it is known that in Japan, girls have higher self-regulation ability than do boys. According to Shoda, Mischel & Peake (1990), higher self-regulation ability in childhood leads to better academic performance in adolescence. Since girls have higher self-regulation ability than do boys in childhood, in adolescence females would thus likewise be expected to show better academic behavior than do males. This would explain why females appear to have higher academic delay of gratification ability than males in the present study. It must be noted, however, that past research has not found sex differences in academic delay of gratification. Further research is needed to gain a better understanding of this result.

Past research has shown that personal variables such as the use of learning strategies (Bembenutty&Zimmerman, 2003; Kim, Chung, Lee & Kwon, 2001; Pintrich & Degoot, 1990), self-efficacy (Bembenutty, 2002), and future time perspective (Klineberg, 1968, Ward, Perry, Wolz & Doolin, 1989) are related to academic delay of gratification. However, past research has not fully indicated whether situational variables influence academic delay of gratification. Therefore, the present study manipulated goal importance and the attractiveness of a distractor and investigated whether these situational factors influenced academic delay of gratification.

When goal importance was low, the distractor H condition hindered effective academic delay of gratification. However, when goal importance was high, effective academic delay of gratification resulted in not only the distractor L condition, but also the distractor H condition. Thus, goal importance and the attractiveness of a distractor interacted with one another and influenced academic delay of gratification.

The correlation coefficients between academic delay of gratification, learning strategy, self-efficacy, and experiential time perspective scores were calculated for the four situations in which goal importance and the attractiveness of a distractor was manipulated. The results differed for males and females.

For males, experiential time perspective related positively to academic delay of gratification in the two goal L conditions. For males, in the goal L distractor H situation, academic delay of gratification correlated positively with experiential time perspective, i.e., self-fulfillment, goal-orientation, and hopefulness. These results indicated that in the goal L distractor H condition, academic delay of gratification was related to having hope in the future, orienting to a goal, and leading a fulfilled life in the present.

In the goal L distractor L condition, academic delay of gratification correlated positively with past acceptance and self-fulfillment. These results indicated that in the goal L distractor L condition, academic delay of gratification was related to accepting the past and leading a fulfilled life in the present. Thus, for males, experiential time perspective was positively related to academic delay of gratification in the two goal L conditions. However, the reason why the students chose delay in the two goals L conditions

remains unclear. Further research is needed to better understand this problem.

On the other hand, for females, the use of learning strategies was positively related to academic delay of gratification in comparative many situations, which indicated that females need to have effective learning strategies to show academic delay of gratification in such situations.

Therefore, in the present study, the results differed for males and females. In males, experiential time perspective was related to academic delay of gratification in the goal L conditions. On the other hand, in females, the use of learning strategies was related to academic delay of gratification in comparative many situations. Further research is needed to gain a better understanding of these findings.

We performed cluster analysis and compared the use of learning strategies, self-efficacy, and experiential time perspective among the clusters. No such analysis was has been performed in past research on academic delay of gratification. The three clusters were abstracted for each sex. In cluster 1, no change was seen in delay scores by situation and the delay scores were basically high, so we referred to cluster 1 as a high delay cluster. In cluster 2, changes in delay scores by situation were observed, so we referred to cluster 2 as a changing cluster. We removed cluster 3 because of the small number of students.

For males, the high delay cluster had higher goal-directedness and hopefulness scores than did the changing cluster. For females, the high delay cluster had higher review summarizing strategy scores than did the changing cluster. These results indicated that for males and females, experiential time perspective and the use of learning strategies, respectively, were related to academic delay of gratification.

In conclusion, the results of the present study indicated that academic delay of gratification is influence by situational variables, and that for males and females, experiential time perspective and the use of learning strategy, respectively, are basically positively related to academic delay of gratification.

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Table 1 Academic delay of gratification questionnaire

Goal low (L) distractor high (H) condition
A subject that you have to study is not needed to. graduate (elective). A movie that you desperately want to see is currently playing. Do you study hard for the subject or go to movie ?
Go to the movie
Not sure
Study

Goal L distractor L condition
A subject that you have to study is not needed to graduate (elective). A movie that you do not want to see is currently playing. Do you study hard for the subject or go see the movie?
Go to the movie
Not sure
Study

Goal H distractor H condition
A subject that you have to study is needed to graduate (nonelective). A movie that you desperately want to see is currently playing. Do you study hard for the subject or go see the movie?
Go to the movie
Not sure
Study

Goal H distractor L condition
A subject that you have to study is needed to graduate (nonelective). A movie that you do not want to see is currently playing. Do you study hard for the subject or go see the movie?
Go to the movie
Not sure
Study

Table 2 Academic delay of gratification score for each condition

	Goal L		Goal H	
	Distraction H	Distraction L	Distraction H	Distraction L
Males	0.66	1.67	1.60	1.81
	(0.87)	(0.60)	(0.68)	(0.48)
Females	0.80	1.72	1.83	1.89
	(0.83)	(0.50)	(0.43)	(0.38)

Table3 Results of the factor analysis of males

	F1	F2	F3	Commonality
Even if I cannot understand, I attempt to comprehend the learning content from the teacher.	.695	.224	.058	.499
When I study for a test, I attempt to remember more learning content.	.818	.177	.064	.695
When I do homework, I remember the learning content from the teacher's instruction so that I can answer the question.	.803	.258	−.103	.646
When I study for a test, I collect clues from the class and book.	.742	.162	−.052	.556
When I do homework, I replace the difficult terms with easy terms.	.697	.233	−.003	.490
When I study for a test, I review the important points repeatedly and memorize them.	.675	.407	−.117	.584
Even if the learning task is boring and uninteresting, I continue to perform.	.591	.562	−.105	.639
When I read the learning content, I think about it repeatedly so that I can remember it.	.647	.206	−.033	.500
When I read, I interrupt and repeat the learning task.	.569	.328	−.180	.507
When I read something, I relate it to things that I already know.	.729	.127	−.250	.569
I utilize the things that I have previously learned when I perform a novel task.	.700	.067	−199	.419
Even when it is not required, I do the exercise.	.287	.762	−.082	.360
I summarize my notes so that I can remember the learning content.	.048	.772	−.119	.643
I summarize the points of the learning content so that I can understand them better.	.575	.638	−.041	.620
It is difficult to understand what is written when I read the textbook during class.	−.226	−.329	.765	.406
It is difficult to understand what the important points are.	.011	−.384	.713	.563
When the task is difficult, I either give up or do an easier task instead.	.023	.263	.537	.583
When the teacher is lecturing, I think about other things and do not listen.	−.080	.031	.735	.539

Table4 Results of the factor analysis of females

	F1	F2	F3	Commonality
Even if I cannot understand, I attempt to comprehend the learning content from the teacher's lecture.	.690	.357	.148	.608
When I study for a test, I attempt to remember more learning content.	.815	.197	.022	.695
When I do homework, I remember the content from the teacher's instruction so that I can answer the question.	.804	.257	−.139	.646
When I study for a test, I collect clues from the class and book.	.739	.247	.022	.598
When I do homework, I replace the difficult terms with easy terms.	.696	.230	−.061	.491
When I study for a test, I review the important points repeatedly and memorize them.	.677	.437	−.137	.585
Even if the learning task is boring and uninteresting, I continue to perform them.	.598	.440	−.339	.742
When I read the learning content, I think about it repeatedly so that I can remember it.	.649	.083	−.224	.514
When I read, I interrupt and repeat the learning task.	.574	.257	−.288	.578
When I read something, I relate it to things that I already know.	.731	.140	−.206	.641
I utilize the things that I have previously learned when I perform a novel task.	.702	.009	−.240	.550
Even when it is not required, I do the exercise.	.295	.726	−.248	.383
I summarize my notes so that I can more easily remember the learning content.	.055	.825	−.165	.686
I summarize the points of the learning content so that I can understand them better.	.577	.707	−.075	.693
It is difficult to understand what is written when I read the textbook during class.	−.244	−.176	.805	.579
It is difficult to understand what the important points are.	−.008	−.201	.810	.585
When the teacher is lecturing, I think about other things and do not listen.	−.091	.041	.504	.569
When the task is difficult, I either give up or do an easier task instead.	.021	.098	.140	.692

Table 5 Results of the factor analysis for males

	F1	Commonality
I can get a good mark.	.709	.583
I can do well in class.	.802	.584
I can solve the tasks and problems given in class.	.843	.676
I can understand the contents of the class.	.795	.686
I can keep up with the level of the class.	.759	.680
I know the content of the class better than the other students.	.827	.655
I can do better than the other students.	.841	.695
I am better at learning than the other students.	.772	.657
I have a higher learning ability than the other students.	.809	.655

Table 6 Results of the factor analysis for females

	F1	Commonality
I can get a good mark.	.764	.503
I can do well in class.	.765	.643
I can solve the tasks and questions given in class.	.822	.710
I can understand the contents of the class.	.817	.633
I can keep up with the level of the class.	.825	.576
I know the content of the class better than the other students.	.809	.685
I can do better than the other students.	.834	.708
I am better at learning than the other students.	.810	.596
I have a higher learning ability than the other students.	.809	.655

Table 7 Correlation coefficients between self-efficacy, learning strategy, time perspective, and academic delay of gratification scores among males

	Goal L		Goal H	
	Distraction L	Distraction H	Distraction L	Distraction H
Self-efficacy	.212$^+$	.155	.103	−.136
General cognitive strategy	−.101	.071	.208$^+$	−.119
Review summarizing strategy	−.098	−.137	.204$^+$	−.080
Giving attention	.141	.045	.206$^+$	−.176
Self-fulfillment	.293**	.201$^+$	.010	−.053
Goal-orientation	.007	.277*	.019	−.105
Past acceptance	.202$^+$	.042	.035	−.117
Hopefulness	.121	.273*	−.043	−.108

Table 8 Correlation coefficients between self-efficacy, learning strategy, time perspective, and academic delay of gratification scores among females

	Goal L		Goal H	
	Distraction L	Distraction H	Distraction L	Distraction H
Self-efficacy	.015	.10	.158	.024
General cognitive strategy	.199*	.138	.212*	$.175^+$
Review summarizing strategy	$.164^+$	$.170^+$	−.007	−.061
Giving attention	−.155	.108	−.087	.009
Self-fulfillment	−.125	−.136	.094	.130
Goal-orientation	−.048	.056	.116	$.185^+$
Past acceptance	−.038	.005	.105	.110
Hopefulness	−.125	−.093	.105	.144

Table 9 Academic delay of gratification scores for each cluster in males

	Goal L		Goal H	
	Distraction L	Distraction H	Distraction L	Distraction H
Cluster 1	1.92 (0.39)	1.76 (0.43)	2.00 (0.00)	2.00 (0.00)
Cluster 2	1.65 (0.61)	0.14 (0.34)	1.91 (0.29)	1.37 (0.74)

Note 2 ( ) is SD.

Table 10 Academic delay of gratification scores for each cluster in females

	Goal L		Goal H	
	Distraction L	Distraction H	Distraction L	Distraction H
Cluster 1	1.96 (0.18)	2.00 (0.00)	2.00 (0.00)	2.00 (0.00)
Cluster 2	1.74 (0.52)	0.37 (0.48)	2.00 (0.00)	1.90 (0.34)

Note 3 ( ) is SD.