

Investigating the relationship between cognitive styles with academic delay of gratification and academic procrastination of male high school students

Tuba Sadat Salari

Bachelor's student of educational sciences, Psychology and Educational Sciences Department, University of Tehran, Iran

Tuba.slri1315@gmail.com

Leila Shahbazi

Lecturer at Psychology and Educational Sciences Department of Ardabili Payame Noor University, Iran

Shahbazi.leila1985@gmail.com

Fereshteh Pourmohseni Koluri

Professor at Psychology and Educational Sciences Department of Mohaghegh Ardabili University, Iran

f_pourmohseni@uma.ac.ir

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Abstract

Desired academic performance is thought to be one of the most important aims of each individual student, his/her family and educational system as well. However, challenges such as academic procrastination and delay of gratification can impact personal and social aspects. The aim of the present research was to investigate the relationship between cognitive styles (adaptive-innovative) with delayed gratification and academic procrastination of male high school students. This cross-sectional descriptive-analytic study, the research population was all male high school students in Ilam city, Iran. The research sample comprised all of students attended in five classrooms (270 persons) who were selected using the Morgan Table sampling method. The research instruments were the "KAI" cognitive style inventory (Kirton, 1967), Tuckman (1991) Procrastination Scale and academic delayed gratification (Anbari et al., 2012). The collected data were analyzed in terms of descriptive and inferential statistics. The findings indicated that there is a meaningful relationship between cognitive style and academic procrastination and delayed gratification; the results acquired from regression analysis proved that along with the increase of adaptive and innovative cognitive style, the delay of gratification of students also increases. The study found a positive and significant correlation between adaptive cognitive style and academic procrastination, while a negative and significant correlation was observed between innovative cognitive style and academic procrastination. Type of cognitive style may influence on academic procrastination and academic delay of gratification in turn impacts students' academic performance. Consequently, to be aware of cognitive styles' role on academic functions is a necessity more than before.

Keywords: Cognitive Style, Academic Procrastination, Academic delay of gratification.

Introduction

Human behavior can be complex and difficult to understand, as it is influenced by a wide range of biological, psychological, social, and cultural factors. One of these complex behaviors is procrastination. In contemporary society, the value of engaging in productive activities and being active, is widely acknowledged. Conversely, procrastination and work postponement are viewed as a deviation from the accepted norms of task completion (Athari et al., 2020). The term Procrastination means the tendency to delay initiation or completion of important tasks to the point of discomfort, which is often viewed as a kind of regulation failure (Shi, 2018). In the same vein academic procrastination is the irrational delay in executing academic assignments required for students (Esmaili Rad et al., 2021). Academic procrastination is an irrational and potentially harmful form of delay that is negatively correlated with academic performance, student health, and emotional well-being (Ziegler & Opdenakker, 2018). While procrastination may not always be problematic, it often impedes progress and can prevent individuals from achieving their goals, resulting in significant and long-lasting consequences. Bembenutty (2009) posits that the development of various types of procrastination can be attributed to differences in cognitive, emotional, and behavioral components among procrastinators. Cognitive style refers to the way of receiving, storing, processing and transmitting information by a person (Saif, 2015). One of the instructional approaches employed in the educational process involves the utilization of cognitive styles. Learning style pertains to the manner in which a learner acquires knowledge, rather than their proficiency in learning. Consequently, learning styles provide valuable insights into individual differences that contribute to academic performance, which are not necessarily linked to an individual's inherent abilities or talents, but rather to their preferred modes of utilizing these abilities (Hosseini-Nasab & Sharifi, 2011). Some students may encounter difficulties in learning and making progress, and educators may unintentionally teach without considering their students' cognitive styles, leading to academic setbacks.

In addition to the academic responsibilities, teenagers engage in various activities such as virtual events, spending time with friends, and pursuing personal interests. It is crucial to establish a balance between these different activities and evaluate them based on their relative importance and value. This is where a framework called "Delay of Gratification" comes into play. This framework provides strategies for managing time effectively and making informed decisions about which activities to prioritize (Cayubit et al., 2016).

Mischel initially introduced the concept of delayed gratification (Ayduk et al., 2000). Wherein children exhibit two main distinct motivations overlapping with values when faced with reward selection: conservation - the desire to reduce uncertainty and preserve the status quo, and self-enhancement - the desire to maximize resources and profit for the self. Accordingly, we hypothesized that conservation values would relate to children's preference to hold on to what is given as soon as possible, and that self-enhancement values would relate to children's preference for delaying gratification (Twito et al., 2019). Michel et al. explored the relationship between children's ability to postpone gratification and their cognitive and social capabilities in adolescence, over a span of approximately a decade. The study demonstrated that children who possessed the skill of delayed gratification exhibited superior social and academic self-control abilities than those who lacked such abilities (Bembenutty, 2009). Enhancing students' ability to delay gratification can potentially lead to improved academic performance and efficiency. Students who demonstrate the characteristic of Academic delay of gratification typically

employ cognitive strategies such as elaboration, organization, and metacognitive strategies such as self-regulation, planning, and self-discipline and time regulation (Kavousian & Karimi, 2019). Establishing long-term and meaningful academic goals is a key motivator for learners, driving them forward in their pursuit of knowledge and achievement. Without a distant goal in mind, individuals may become sidetracked by other, more immediately gratifying pursuits. However, those with long-term goals are more likely to remain focused and committed to their chosen path (Arabzadeh & Kodivar, 2012).

Kirton (1976) proposed a new cognitive style, also known as adaptive-innovative cognitive styles a mechanism for guiding individuals' responses to change and transformation, facilitating effective decision-making and the utilization of creativity. Individuals with an innovative learning style tend to be analytical and strive to develop novel approaches in problem-solving and information processing. In general, individuals who are considered innovative possess several key characteristics. Firstly, they exhibit diversity in their actions and thinking. Secondly, they actively seek out new problems to solve, rather than solely focusing on their own. Thirdly, they tend to approach tasks in a random and non-linear manner. Fourthly, they exhibit divergent thinking, which enables them to generate multiple solutions to a given problem. Fifthly, they are comfortable with unstructured situations. Lastly, they tend to be more challenging than confirming, as they are driven by their ideals and can be unpredictable in their actions (Asadzadeh, 2013). Conversely, individuals with an adaptive cognitive style typically accept the existing space and context of problems as they are and tend to rely on conventional and traditional methods to provide solutions and address problems (Banimahd & Mehrani, 2022). They approach their tasks in an organized and disciplined manner and exhibit a clear and purposeful approach to assignments, employing effective methods and structures. Additionally, they tend to rely on proven strategies and techniques (Asadzadeh, 2013).

The adaptive-innovative cognitive style can impact various aspects of education, including the ability to delay short-term or long-term goals, problem-solving skills, the level of effort students invest in the learning process, and even the teaching methods employed by educators. Upon close inspection of learners and their performance, it becomes apparent that while there may be minimal disparities in their abilities and talents, there exist notable discrepancies in their academic advancement despite using similar learning materials and textbooks. Consequently, exploring the influential factors in academic progress, such as academic gratification delays and academic procrastination, can mitigate the ramifications of scholastic failure and foster an environment conducive to learning enhancement. Furthermore, acknowledging these variables and devising appropriate approaches to augment learning and promote students' academic growth is imperative.

The aim of the present research was to investigate the relationship between cognitive styles (adaptive-innovative) with delayed gratification and academic procrastination of male high school students. For this general purpose, following questions were tried to be answered:

Is there a relationship between adaptive cognitive styles and delayed academic gratification among male high school students?

Is there a relationship between adaptive cognitive styles and academic procrastination among male high school students?

Is there a relationship between innovative cognitive styles and delayed academic gratification among male high school students?

Is there a relationship between adaptive cognitive styles and academic procrastination among male high school students?

Method

2.1. Procedure

The present study represents an applied research approach, as it seeks to explore the relationship between cognitive styles (specifically, adaptive-innovative) and delayed academic gratification and procrastination among male high school students. The research methodology involved a combination of field-based data collection and document analysis. The initial phase of data collection included interviews, observations, and a thorough review of relevant literature, while the second phase centered on the administration of an information questionnaire.

2.2. Participants

The statistical population of this study consisted of all male students enrolled in public high schools in Ilam city. The study's sample consisted of 270 students, selected through a random cluster sampling process according to Morgan's table. The selection of students was carried out through a two-stage process involved the random selection of classes from each educational level, followed by the selection of individual students from the chosen classes.

2.3. Instrument

"KAI" cognitive style inventory (Kirton, 1967)

The KAI (Kirton, 1976) is used as the measure of the domain of cognitive style. The measure evaluates the position of an individual's preference along the Adaptive Innovative continuum of two distinct types of problem solving. One end is concerned with Adaption which relates to algorithmic and paradigm consistent thinking. The other end is concerned with Innovation and relates to paradigm breaking thinking and transformation. The questionnaire consists of 33 self-rated items with a 1–5 point scale (very easy, easy, neither easy nor difficult, difficult, and very difficult). Participants are asked to indicate the extent to which each item will be easy or difficult for them to maintain over an extended period. For example, "as an individual who looks at problems and issues from new angles" or "as an individual who follows predetermined paths without deviation" The minimum score is 32, and the maximum score is 160. The questionnaire categorizes participants into two cognitive style groups: innovation/seeker (scores from 160 to 97) and adaptation/acceptor (scores from 96 to 32). The KAI cognitive style inventory has been reported to have a reliability coefficient of 0.90 (Kirton, 1999). In Banimahd & Maharani's research (2022) the reliability coefficient of this has been reported 0.83.

The Academic gratification Delay Scale (Anbari et al., 2013)

The Academic gratification Delay Scale was developed by Anbari and colleagues in 2013. The instrument comprises 18 items rated on a five-point Likert scale (ranging from "very high" to "very low," with scores ranging from 5 to 1), yielding a total score ranging from 18 to 90. Scores between 4.32 and 18 indicate very low, scores between 5.32 and 8.46 indicate low, scores between 9.46 and 2.61 indicate moderate, scores between 3.61 and 6.75 indicate high, and scores between 7.75 and 90 indicate very high with the field of study. To establish the validity of the ASDS, a panel comprising experts in medical education, curriculum planning, and psychiatry used the Delphi technique to assess delayed of gratification with the field of study. The instrument's reliability was evaluated using Cronbach's alpha coefficient, which yielded a value of 0.81, indicating high internal consistency.

Tuckman Procrastination Scale (TPS)

The Tuckman Procrastination Scale was developed to assess college students' procrastination tendencies (Tuckman, 1991). The questionnaire was first implemented and standardized in 2001 at the University of Toronto to measure student procrastination. The English version of the instrument included 16 items which are scored on a four-point Likert scale (i.e. 1 = that's me for sure, 2 = that's my tendency, 3 = that's not my tendency, 4 = that's not me for sure) and had a one-factor solution. Answers are scored on a scale of 1-2-3-4, respectively. Twelve items are scored directly and four items (7-12-14-16) are scored upside down. Based in this the total points of each question are added together. The scores obtained is in the range of 16-64 where a high score means a greater tendency to procrastination. . The validity of this questionnaire was confirmed in the studies of Tuckman (2007) and its reliability with Cronbach's alpha of 0.89 indicates the acceptable reliability of this questionnaire. In other studies Akinsola & Tella (2007) reported Cronbach's α to be 0.88. Panahipour et al., (2019) also used this test to measure procrastination and Cronbach's alpha coefficient was 0.87, indicating high internal consistency of the instrument.

Results

Table 1. Comparative table of the relationship between cognitive styles and academic procrastination and academic gratification delay of male secondary level students

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Variables	Significance level (p)	Correlation coefficient	Standard deviation	Mean	Sample size
Cognitive style (adaptive-innovative)	0.001	.837**	9.36497	3.4722	270
Academic procrastination and gratification delay of students			9.50630	3.6944	270

Note: ** $p < 0.01$, indicating a statistically significant correlation between cognitive styles and academic procrastination and gratification delay of students.

The table reveals that the significance level of the test ($p=0$) is smaller than the alpha value of the test (0.05), which confirms the research hypothesis and supports the existence of a relationship between cognitive style and academic procrastination and gratification delay among secondary level male students. The substantial correlation coefficient of .837 between these two variables indicates a significant positive relationship between them, implying that an increase in the cognitive styles is associated with a simultaneous increase in academic procrastination and gratification delay of students, and vice versa.

Table 2: Comparative table between adaptive cognitive styles in relation to academic gratification delay in students

Variables	Significance level (p)	Correlation coefficient	Standard deviation	Mean	Sample size
Adaptive cognitive style	0.001	.783**	0.16912	3.0000	270
Academic gratification delay			0.29527	3.4722	270

Note: ** $p < 0.01$, indicating a statistically significant correlation between adaptive cognitive style and academic gratification delay in students

The results of the analysis indicate that the research hypothesis was confirmed, as the significance level of the test ($p=0.001$) was smaller than the set alpha level (0.05). Consequently, a significant relationship was found between adaptive cognitive style and academic gratification delay in secondary level male students. The correlation coefficient of .783* suggests a strong positive relationship between these two variables, indicating that an increase in adaptive cognitive styles is associated with a concomitant increase in academic gratification delay among students, and vice versa.

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Table 3: Comparative table between adaptive cognitive styles in relation to academic procrastination in students

Variables	Significance level (p)	Correlation coefficient	Standard deviation	Mean	Sample size
Adaptive cognitive style	0.012	.159*	9.36497	3.6167	270
Academic procrastination			2.51294	3.4722	270

Note: * $p < 0.05$, indicating a statistically significant correlation between adaptive cognitive style and academic procrastination in students.

The results of the analysis indicate that the research hypothesis was confirmed, as the significance level of the test ($p=0.012$) was smaller than the set alpha level (0.05). Consequently, a significant relationship was found between adaptive cognitive style and academic procrastination in male students at the secondary level. However, the correlation coefficient of .159 suggests a weak positive relationship between these two variables, indicating

that an increase in adaptive cognitive style is associated with only a slight increase in academic procrastination among students, and vice versa.

Table 4: Comparative table between innovative cognitive styles in relation to academic gratification delay in students

Variables	Significance level (p)	Correlation coefficient	Standard deviation	Mean	Sample size
innovative cognitive style	0.001	.860**	9.36497	3.6611	270
Academic gratification delay			1.78215	3.4722	270

Note: ** $p < 0.01$, indicating a highly statistically significant correlation between innovative cognitive style and academic gratification delay in students

The results of the statistical analysis indicate that the research hypothesis was confirmed, as the significance level of the test ($p=0.001$) was smaller than the set alpha level (0.05). Thus, a significant relationship was found between innovative cognitive style and academic gratification delay in male students at the secondary level. Furthermore, the correlation coefficient of .860** indicates a highly statistically significant positive relationship between these two variables. The results suggest that an increase in innovative cognitive style is associated with a significant increase in academic gratification delay among students, and vice versa.

Table 5: Comparative table between innovative cognitive styles in relation to academic procrastination in students

Variables	Significance level (p)	Correlation coefficient	Standard deviation	Mean	Sample size
innovative cognitive style	0.001	.815**	9.36497	81.7240	270
Academic procrastination			3.26864	3.4722	270

Note: ** $p < 0.01$, indicating a highly statistically significant correlation between innovative cognitive style and academic procrastination in students

The results of the statistical analysis indicate that the research hypothesis was confirmed, as the significance level of the test ($p=0.001$) was larger than the set alpha level (0.05). Thus, a significant inverse relationship was found between innovative cognitive style and academic procrastination in male students at the secondary level. Furthermore, the correlation coefficient of .815** indicates a highly statistically significant negative relationship between these two variables. This finding suggest that an increase innovative cognitive style is associated with a significant decrease in academic procrastination among students, and vice versa. Therefore, students with an innovative cognitive style may have a lower tendency to procrastinate academically.

Discussion and conclusion

The results of this investigation indicate a significant and positive correlation between the adaptive-innovative cognitive styles and academic procrastination and academic delayed gratification in male high school students. The results proved that along with the increase of adaptive and innovative cognitive style, the delay of gratification of students also increases. The study found a positive and significant correlation between adaptive cognitive style and academic procrastination, while a negative and significant correlation was observed between innovative cognitive style and academic procrastination.

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There is a significant positive relationship between the adaptive cognitive style and delayed academic gratification of students. Students who exhibit a more adaptive cognitive style are have more academic delayed gratification. If a student is able to plan strategies effectively, monitor and evaluate their performance, and complete tasks within designated timeframes, they will have a better capacity for setting and controlling realistic short-term and long-term goals. This leads to a sense of satisfaction from one's efforts and increases the likelihood of achieving long-term objectives (Howell & Buro, 2011). Self-regulated learning is an academic concept that refers to a learner's ability to regulate and control their own cognitive, motivational, and behavioral processes in order to achieve specific learning goals. This involves setting goals, monitoring progress, and making adjustments to learning strategies as needed (Naghi Beiranvand et al., 2018). Cognitive strategies refer to the deliberate actions that learners take to process and integrate new information with their existing knowledge and to store it in long-term memory. To be more precise, there was a significant correlation between self-regulated learning and both academic delayed of gratification and academic performance. Students who have regulating their own learning may experience higher level of delayed academic gratification (Adams & Forsyth, 2011; Khodarahmi& Zarrinabadi, 2016).

There is a relationship between the adaptive cognitive style and academic procrastination in high school male students (It should be noted that whilst the observed relationship is positive and significant, the empirical evidence suggests that it lacks substantial strength). Students who exhibit a more adaptive or receptive cognitive style may struggle with procrastination, avoidance behaviors, and goal-setting, which can have negative consequences on their academic performance. According to Pounds and Bailey's research (2001) on the relationship between cognitive style and academic performance, specifically focusing on the performance of innovative and adaptive individuals in completing cognitive tasks; their findings confirmed that students with an innovative cognitive style exhibited better academic performance compared to students with an adaptive cognitive style. The results of the correlation analysis of metacognitive beliefs and academic procrastination indicate that among the components of

metacognitive beliefs, uncertainty is the most important predictive variable for academic procrastination. Individuals with negative beliefs about their cognitive sufficiency may experience self-doubt and uncertainty about their ability to start or complete a task. This can result in negative motivational effects, making it difficult for them to initiate or persist with the task. Consequently, individuals may avoid approaching the task altogether and become disengaged, leading to an increase in procrastination. Such negative beliefs may be associated with low self-esteem, anxiety, frustration, and fear of failure, which can further exacerbate procrastination tendencies (Lim & Javadpour, 2021). In certain respects, these findings were incongruent with those reported by Janabadi & Javadian, (2021) indicating that students who exhibit an adaptive cognitive style in their approach to completing academic assignments, as well as in their engagement with teacher and non-curricular training, are less likely to engage in procrastination.

A statistically significant positive relationship has been found between the innovative cognitive style and delay in academic gratification among male middle school students. Innovative students who exhibit the ability to delay academic gratification often share certain characteristics, including strong problem-solving skills, a persistent approach to completing homework, high levels of self-efficacy and internal motivation (Darbyshire & Haarms, 2015), and effective use of self-regulated learning strategies (Barzegar Bafrooei et al., 2019; Azemi et al., 2020). Self-regulation in learning refers to the capacity of learners to monitor and evaluate their own behavior and to structure their learning environment in a manner that enhances the productivity of their efforts. This ability enables individuals to pursue their long-term aspirations and objectives, prioritizing their self-worth over the immediate gratification of less significant desires and goals (Herndon & Bembentuty, 2017).

According to the last hypothesis, a negative correlation has been found between the innovative cognitive style and academic procrastination among students. Individuals who exhibit such cognitive styles may be less prone to procrastination. Research suggests that students with a pragmatic cognitive style are less prone to academic procrastination. This cognitive style is marked by strong problem-solving abilities, decisiveness, and proficiency in making analogical arguments. Pragmatic learners excel in planning, managing tasks, and taking calculated risks. These psychological characteristics may play a role in reducing the incidence of academic neglect among individuals with a pragmatic cognitive style (Asadzadeh, 2018). Janabadi & Javadian (2021) suggested that students exhibit an innovative cognitive style when performing academic responsibilities, demonstrate a preference for approaching tasks with creativity and originality, challenging the status quo and generating novel solutions to existing problems. The ability to embrace an innovative cognitive style allows these students to approach tasks from unconventional angles, which may enhance their productivity and reduce their inclination towards procrastinatory behaviors.

Limitation and suggestion

This research has several limitations, including the fact that the sample size was limited to male secondary students due to restrictions on obtaining performance permits for educational and training purposes. To effectively teach metacognitive skills to students, it is essential for teachers to possess these skills themselves. Therefore, it is recommended that teacher training programs prioritize the development of cognitive and metacognitive skills. Additionally, conducting research on other student populations at different educational levels and involving

both genders would be beneficial for further examining and comparing the results of metacognitive skill instruction. Given the importance of teachers possessing metacognitive skills, it is recommended that the Vice-Presidents of Education prioritize their training through in-service courses. Additionally, it is suggested that cognitive and metacognitive strategies be incorporated into the curriculum to gradually introduce these skills to students, allowing them to organize and evaluate their learning process. By replacing traditional teaching methods with cognitive and metacognitive education approaches, it is possible to bring about significant changes to the education system in this field.

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