



*Research Paper*

## Discrimination of Students with High and Low Academic Procrastination Based on Components of Sense of School Connectedness and Cognitive Flexibility

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### Abstract

**Aim:** This study aimed to differentiate students with high and low academic procrastination based on the sense of school connectedness and cognitive flexibility components. The research method was causal-comparative. The statistical population included all male and female high school students in Khaf city, among whom 368 individuals were selected by cluster sampling. Cognitive Flexibility Inventory, Students' Sense of Connectedness with School Scale, and Procrastination Assessment Scale were used to collect data. Data were analyzed using SPSS-24 software and discriminant analysis. The findings showed that the obtained discriminant function was significant and the components of teacher support, controllability perception, and scientific distribution had the highest differentiation power ( $p < 0.01$ ). The results of the discriminant analysis showed that according to the obtained function, 88.8% of students in the two groups were correctly reclassified which indicates the ability of these components to differentiate students at different levels of academic procrastination.

**Keywords:** *Cognitive flexibility, sense of school connectedness, academic procrastination*

## Introduction

Studies show that procrastination is one of the common experiences of human beings and includes different types, among which academic procrastination is the most common. Academic procrastination is a purposeful and unnecessary delay doing academic tasks (Hen and Goroshit, 2020). According to the existing literature, many students suffer from procrastination in their academic life.

Various studies in the domain of cognitive approaches have introduced cognitive flexibility as a cognitive variable related to students' procrastination (Schommer-Aikins and Easter, 2018; Emamverdi and Taher, 2020). Cognitive flexibility is an important aspect of executive function and refers to the ability to adapt behaviors in response to environmental changes (Durairaja and Fendt, 2021). Meanwhile the lack of cognitive flexibility leads to passive reaction to the environment and delays in doing things (Sternberg and Frensch, 1992). Among other factors affecting academic procrastination, the sense of school connectedness affects students' procrastination because school as a productive environment can create a sense of belonging in students and this feeling helps students demonstrate better time management for their homework (Çıkırıkçı & Erzen, 2020).

The prevalence of academic procrastination indicates the need for further research to identify potential factors that lead to academic procrastination, and subsequently consider appropriate strategies to reduce procrastination (Zhou, et al., 2021). Therefore, the present study seeks to answer the question of whether the components of sense of school connectedness and cognitive flexibility can differentiate students with high and low procrastination.

## Methodology

This causal-comparative study aimed to differentiate students with high and low academic procrastination based on the components of sense of school connectedness and cognitive flexibility. The statistical population of the study included male and female high school students in Khaf city in the academic year 2021-2022. Among them, 368 were selected by cluster sampling according to Krejcie and Morgan's table. Based on the academic procrastination scores, 95 students with scores lower than the first quartile were selected as students with low academic procrastination, and 92 students with scores higher than the third quartile were selected as students with high academic procrastination. Finally, data from these 187 individuals was analyzed by discriminant analysis.

**Procrastination assessment scale - student version (PASS):** Academic procrastination was assessed by the Solomon and Rothblum (1984)

Procrastination Assessment Scale, which includes 27 items and three components: preparation for exams, homework preparation, and essay preparation. In this study, Cronbach's alpha for the whole scale was 0.87.

**Students' sense of connectedness with school (SSCS):** This scale was designed by Brew et al. (2004) and consists of 27 items and six subscales of teacher support, participation in the community, respect and fairness in school, positive feeling about school, belonging to school, and scientific contribution. In this study, the reliability was obtained as 0.89 through Cronbach's alpha for the whole scale.

**Cognitive Flexibility Inventory (CFI):** This questionnaire was designed by Dennis and Vander Wal (2010) and consists of 20 items and three subscales of perception of controllability, perception of different options, and perception of behavior justification. The Cronbach's alpha for the whole scale in the present study was 0.89.

## Results

Using histogram plot and Kolmogorov-Smirnov test showed that the distribution of predictor variables was normal. The results of multivariate outlier data using Mahalanobis distance showed that there were ten real outlier data; therefore, this data was deleted before the analysis. In order to evaluate the homogeneity of the variance-covariance matrix, the Mbox test was used and showed the homogeneity of the variance-covariance matrix of the predictor variables within the groups (Mbox statistic = 6.77,  $F = 2.23$ ,  $P > 0.05$ ). Also, the results of the Pearson correlation coefficient matrix and statistical indices of variance inflation factor and tolerance index showed that there were no significant correlations among the predictor variables and the assumption of non-collinearity was confirmed.

**Table 1:** Mean and standard deviation of predictor variables for two groups with high and low academic procrastination and independent t-test results to examine the significance of the difference between the means of the two groups

Predictor variables	Students with high academic procrastination		Students with low academic procrastination		t statistic	Significance level
	Mean	Standard deviation	Mean	Standard deviation		
Teacher support	25.20	3.87	31.79	3.50	12.22	0.001
Participation in the community	11.54	2.35	14.05	1.90	8.01	0.001
Respect and fairness in	11.68	2.22	14.26	1.62	9.30	0.001

school						
Positive feeling about school	10.76	1.65	14.15	1.47	6.06	0.001
Belonging to school	8.22	1.68	9.21	1.50	4.26	0.001
Scientific contribution	9.62	1.37	11.29	0.94	9.69	0.001
Controllability	30.24	8.56	44.61	8.75	11.35	0.001
Perception of different options	49.54	6.55	59.30	7.48	9.48	0.001
Perception of behavior justification	9.37	2.36	9.90	2.70	1.44	0.152

Table 1 presents the mean and standard deviation of the components of predictor variables for two groups of students with high and low academic procrastination and t-test results to examine the significance of the difference in means between the two groups. A significant difference was observed between the two groups in terms of the components except perception of behavior justification.

**Table 5:** Results of classifying students in groups with high and low academic procrastination based on the obtained discriminant function

	Student classification	Predicted grouping		Total	
		Low academic procrastination	High academic procrastination		
Main grouping	Number	Low academic procrastination	83	12	95
		high academic procrastination	9	83	92
	Percent	Low academic procrastination	87.4	12.6	100%
		high academic procrastination	9.8	90.2	100%

Table 5 presents the results of classifying students in groups with high and low academic procrastination based on the obtained discriminant function. Accordingly, 83 students (87.4%) with low academic procrastination and 83 students (90.2%) with high academic procrastination were identified. Also, in total, about 88.8% of the students were correctly regrouped in their primary group, which showed the ability of the components of the variables

of school connectedness and cognitive flexibility in differentiating between students with high and low academic procrastination.

## Discussion and conclusion

Our findings showed that the components of the sense of school connectedness were able to significantly differentiate students with high and low academic procrastination. This finding can be explained in that as students' sense of school belonging and attachment decreases, they will be more likely to find excuses to reduce their willingness to complete homework and academic activities. Among other findings of this study was that the components of cognitive flexibility, except the component of perception of behavior justification, were able to significantly differentiate students with high and low academic procrastination. In fact, students with high cognitive flexibility use more effective and useful methods when faced with various stresses; it appears delaying homework is not one of the effective strategies and methods for such students.

The lack of gender separation in this study limits the generalizability of findings. It is suggested that future studies examine the relationship of academic procrastination with cognitive flexibility and the sense of school connectedness regarding gender factor. Given the results, it is suggested that researchers evaluate the effectiveness of various programs and plans to improve the sense of school connectedness and cognitive flexibility.

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