

Exploring Cognitive-Emotional Profiles of Procrastination: Perfectionism, Metacognitive Beliefs, and Self-Efficacy

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ABSTRACT

Objective: The present study aimed to identify distinct subgroups of students based on a combination of cognitive-emotional variables including perfectionism, metacognitive beliefs, and self-efficacy, and to examine how these latent profiles are related to the procrastination.

Method: A multi-stage cluster random sampling method was employed to select the participants. In the first stage, the university's faculties were considered primary clusters. From the total of faculties, six faculties were randomly selected. In the second stage, given the statistical nature of the "latent profile analysis", a sample of 365 students was selected using the convenience sampling method. Participants completed standard scales of procrastination, multidimensional perfectionism, metacognitive questionnaire, and general self-efficacy questionnaire. Data were analyzed using a person-centered approach and the statistical method of Latent Profile Analysis (LPA).

Results: Latent Profile Analysis (LPA) revealed four distinct profiles: Adaptive/Self-Efficacious (21%), Maladaptive Perfectionists (26%), Strategic Procrastinators (34%), and Vulnerable/Avoidant (19%). A one-way ANOVA indicated significant differences in procrastination severity across profiles ($F(3, 361) = 20.18, p < .001, \eta^2 = .14$). Tukey post-hoc tests confirmed that the Vulnerable profile exhibited the highest level of procrastination ($M_{diff} = 1.10, p < .001$ compared to the Adaptive profile).

Conclusions: The findings of this study, confirming the heterogeneity of the procrastination phenomenon, indicate that therapeutic interventions should not be the same; rather, they should be designed to suit the specific profile of each group (such as focusing on modifying metacognitive beliefs in strategic procrastinators or strengthening self-efficacy in vulnerable groups).

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Introduction

Procrastination remains a pervasive challenge in higher education, with recent evidence highlighting its detrimental impact on students' psychological well-being, including heightened anxiety and diminished self-esteem (Anwar & Sitwat, 2024; Sudirman, 2023). Defined as the voluntary, conscious, and irrational delay in beginning or completing intended courses of action despite the expectation of negative consequences (Steel, 2007), this phenomenon extends beyond mere time management deficits and primarily stems from failures in self-regulatory processes (Ziegler & Opdenakker, 2018). This self-regulatory failure creates a profound gap between "intention" and "action" (Chu & Choi, 2005) and is rooted in the complex interplay of cognitive and emotional factors. From an emotional perspective, procrastination frequently serves as a defensive strategy against fear of failure and maladaptive perfectionism (Anwar & Sitwat, 2024; Sudirman, 2023). Conversely, from a cognitive perspective, negative metacognitive beliefs and deficits in self-efficacy play a pivotal role in perpetuating this cycle (Fernie et al., 2017; Rad et al., 2025). Consequently, procrastination is a multidimensional construct wherein components such as perfectionism, metacognitive beliefs, and self-efficacy operate intertwinedly to impede academic progress (Alhadabi et al., 2023).

Given this complexity, understanding underlying mechanisms requires moving beyond linear analyses to explore the simultaneous interaction of these key cognitive and emotional factors. Therefore, adopting person-centered approaches, such as Latent Profile Analysis (LPA), appears essential for identifying distinct and heterogeneous patterns among procrastinating students (Gross et al., 2024). Although existing literature has provided extensive evidence regarding the relationships between procrastination and perfectionism (Gaikwad & Shukla, 2025), metacognitive beliefs (Mishra, 2025), and self-efficacy (Wardani et al., 2021), a major methodological limitation persists. The majority of prior research has relied on "variable-centered approaches," such as correlation and regression analyses (e.g., Anwar & Sitwat, 2024; Rad et al., 2025; Safari & Yousefpoor, 2022). These approaches assume population homogeneity, implying that a variable exerts a uniform effect on procrastination across all individuals. This reductionist perspective overlooks how these cognitive and emotional characteristics combine and interact within a single individual. For instance, one group of students may possess high perfectionism but, due to high self-efficacy and positive metacognition, may not engage in procrastination (Sederlund et al., 2020), whereas another group with the same level of perfectionism but low self-efficacy may experience severe procrastination. Traditional approaches are incapable of identifying these combinatorial patterns. To overcome this limitation, recent studies have demonstrated that LPA is a powerful tool for identifying distinct subgroups based on multiple characteristics (e.g., Alhadabi et al., 2023; Gross et al., 2024; Valenzuela et al., 2020). However, research specifically exploring

latent profiles based on the triad of "perfectionism, metacognitive beliefs, and self-efficacy" remains absent, representing the gap this study aims to bridge.

One of the most prominent constructs playing a decisive role in self-regulatory failures is "perfectionism." Critically, the literature emphasizes that perfectionism is not monolithic; distinguishing between "adaptive" and "maladaptive" perfectionism is essential for understanding procrastination. Maladaptive perfectionism, characterized by excessive concern over mistakes, doubts about actions, and fear of negative evaluation, shows a strong positive correlation with procrastination (Gaikwad & Shukla, 2025). Anwar and Sitwat (2024) demonstrated that maladaptive perfectionists postpone tasks due to severe self-criticism and a constant fear of failure. These findings have been corroborated by research indicating that maladaptive perfectionism traps the individual in a vicious cycle of anxiety and avoidance by establishing unrealistic standards and an excessive fear of making errors (Huang et al., 2023; Sudirman, 2023). In contrast, adaptive perfectionism—characterized by high personal standards, orderliness, and organization—does not necessarily lead to procrastination and may even serve a protective function. Sederlund et al. (2020) found that adaptive perfectionists, who possess high conscientiousness, are less prone to destructive procrastination and experience higher levels of mental health and self-efficacy. Similarly, dimensions such as "organization" and striving for order have a significant inverse relationship with procrastination (Gaikwad & Shukla, 2025; Wardani et al., 2021). Thus, examining perfectionism not as a single variable but as part of a complex cognitive profile is essential.

In explaining the cognitive mechanisms underlying procrastination, contemporary models move beyond personality traits to emphasize the role of "metacognition." The Self-Regulatory Executive Function (S-REF) model, developed by Fernie et al. (2017) to explain procrastination, posits that the phenomenon arises from the activation of the "Cognitive Attentional Syndrome" (CAS)—a pattern involving perseverative worry, rumination, and threat monitoring. This syndrome is driven by the individual's metacognitive beliefs, which are divided into two categories. Positive metacognitive beliefs refer to the perceived utility of worry or performing under pressure (e.g., "Worry helps me solve problems"). Fernie et al. (2017) demonstrated that these beliefs primarily lead to "intentional procrastination." Conversely, negative metacognitive beliefs play a more destructive role in "unintentional" and chronic procrastination, focusing on the "uncontrollability" and "danger" of thoughts. Research indicates that when these beliefs are activated, the individual resorts to avoidance behaviors to escape cognitive distress (Fernie et al., 2017; Fernie et al., 2018). Recent findings by Mishra (2025) confirmed that the component of "uncontrollability and danger of thoughts" is the strongest metacognitive driver for delaying task initiation. Furthermore, Malek (2022) and Pourmousab Zanjany et al. (2022) have confirmed that negative beliefs regarding uncontrollability are directly associated with increased procrastination.

Thus, the S-REF model suggests that procrastination is the product of a complex interaction between the belief in the utility of worry and the belief in the lack of control over worry.

The third side of the cognitive-emotional triangle is "self-efficacy." Studies indicate that self-efficacy plays a vital protective role against procrastination (Huang et al., 2023; Wardani et al., 2021). The mechanism involves students with low self-efficacy appraising tasks as threats to their self-esteem and turning to procrastination to avoid this threat. The role of self-efficacy becomes particularly prominent in its interaction with perfectionism. Williams and Edwards (2021) showed that adaptive perfectionism can lead to reduced procrastination only when it passes through the pathway of "increased self-efficacy." Huang et al. (2023) confirmed that self-efficacy can buffer the negative effects of academic pressure. However, the literature also points to complexities: Kurtovic et al. (2019) found that maladaptive perfectionism can act as a powerful positive predictor, effectively neutralizing the positive effects of self-efficacy. Moreover, Pourmousab Zanjany et al. (2022) emphasized that motivational beliefs such as self-efficacy prevent procrastination only when accompanied by effective learning strategies. These contradictory findings further highlight the necessity of utilizing Latent Profile Analysis (LPA) to understand how different levels of self-efficacy combine with perfectionism and metacognitive beliefs in various student subgroups.

Despite the rich literature on the separate roles of these constructs, the manner in which they cluster within individuals remains underexplored. Research evidence suggests that these variables do not operate independently but form distinct psychological profiles through their interaction. It is plausible that a "high-risk" group is identifiable, characterized by high maladaptive perfectionism, high negative metacognitive beliefs, and low self-efficacy, which would experience the highest level of chronic procrastination (Anwar & Sitwat, 2024; Mishra, 2025). Conversely, an "adaptive" profile distinguished by high self-efficacy, adaptive perfectionism, and low negative metacognitive beliefs likely exhibits the least destructive procrastination (Sederlund et al., 2020). Given the distinction between active and passive procrastination (Fernie et al., 2017), intermediate profiles with more complex combinations are also probable. Therefore, the present study aimed to identify and classify latent cognitive-emotional profiles among students based on the indicators of perfectionism, metacognitive beliefs, and self-efficacy using Latent Profile Analysis (LPA). Specifically, the following research questions are addressed:

RQ1: How many distinct latent profiles can be identified based on positive/negative perfectionism, positive/negative metacognitive beliefs about procrastination, and general self-efficacy?

RQ2: What are the specific characteristics (patterns of indicator means) of each extracted profile?

RQ3: Do the identified profiles differ in terms of the severity of academic procrastination?

Methods

Design

This study adopted a cross-sectional correlational approach.

Participants

The statistical population of the present study included students of the University of Tehran. A multi-stage cluster random sampling method was employed to select the participants. In the first stage, the university's faculties were considered primary clusters. From the total of faculties, six faculties were randomly selected. In the second stage, within each selected faculty, two to three academic departments were randomly chosen as secondary clusters. Subsequently, within each selected department, all students present in the core courses of that semester were invited to participate in the study. Given the statistical nature of the "latent profile analysis", a sample of 400 students was selected using the convenience sampling method. The target sample size of 400 was determined a priori based on simulation studies recommending $N > 300$ for stable latent profile analysis with continuous indicators (Nylund-Gibson & Choi, 2018) and to account for an anticipated 10-15% attrition rate due to incomplete responses. After obtaining the necessary permissions, the participants were assured that their information would remain completely confidential and would be used solely for research purposes. The implementation process included providing explanations about the research objectives and completing self-report scales.

Instruments

In order to measure the research variables, the following standard and valid instruments were used:

Decisional Procrastination Scale (DPS). The Decisional Procrastination Scale, developed by Mann (1982), was employed to assess participants' tendency to delay decision-making. This scale is a unidimensional self-report instrument consisting of five items. Respondents rate each item on a 5-point likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The original scale has demonstrated adequate test-retest reliability (Beswick et al., 1988; Ferrari et al., 1995) and has been validated in numerous studies supporting its use (Ferrari et al., 1995). In Iran, the psychometric properties of the DPS were examined by Hosseini and Khair (1998), who reported an internal consistency coefficient (Cronbach's alpha) of .78. In the present study, Cronbach's alpha for the DPS was .81.

Positive and Negative Perfectionism Scale (PANPS). The Positive and Negative Perfectionism Scale, developed by Terry-Short, Owens, Slade, and Dewey (1995), was used to measure both adaptive and maladaptive dimensions of perfectionism. The PANPS is a 40-item self-report questionnaire comprising two independent subscales: Positive Perfectionism (20 items) and

Negative Perfectionism (20 items). Items are rated on a 5-point likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The original study by Terry-Short et al. (1995) reported internal consistency for both subscales, with Cronbach's alpha coefficients of .88 for Positive Perfectionism and .92 for Negative Perfectionism in subsequent validation research. The Persian version of the PANPS was validated by Besharat (2005), who reported Cronbach's alpha coefficients of .90 for Positive Perfectionism and .87 for Negative Perfectionism in a sample of Iranian university students. In the present study, Cronbach's alpha coefficients were .88 for Positive Perfectionism and .84 for Negative Perfectionism.

Metacognitive Beliefs About Procrastination Questionnaire (MBAP). The Metacognitive Beliefs About Procrastination Questionnaire, developed by Fernie et al. (2009), was utilized to assess metacognitive beliefs specifically related to procrastination. The MBAP is a 16-item self-report measure comprising two distinct subscales, each containing 8 items: Positive Metacognitive Beliefs About Procrastination (PMBP) and Negative Metacognitive Beliefs About Procrastination (NMBP). Items are rated on a 4-point likert scale ranging from 1 (*do not agree*) to 4 (*agree very much*). Confirmatory factor analysis in the original validation study confirmed the two-factor structure of the MBAP, with fit indices indicating a reasonable fit to the data (RMSEA = .058, CFI = .96, NNFI = .95). Fernie et al. (2009) reported Cronbach's alpha coefficients of .87 for the PMBP subscale and .84 for the NMBP subscale.

The Persian version of the MBAP has been utilized in previous Iranian research (e.g., Safari & Yousefpoor, 2022), and studies have confirmed its favorable psychometric properties and two-factor structure in Iranian student populations. In the present study, Cronbach's alpha coefficients were .80 for the PMBP subscale and .86 for the NMBP subscale.

New General Self-Efficacy Scale (NGSE). The New General Self-Efficacy Scale, developed by Chen et al. (2001), was employed to measure participants' generalized belief in their ability to perform effectively across a wide range of achievement situations. The NGSE is an 8-item unidimensional self-report measure. Respondents rate each item on a 5-point likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Chen et al. (2001) demonstrated that the NGSE possesses high internal consistency (Cronbach's alpha = .87) and superior construct validity compared to earlier measures, as well as the ability to predict specific self-efficacy across various tasks and contexts. In Iran, the Persian version of the NGSE was validated by Davari et al. (2020), who confirmed its unidimensional factor structure and reported a Cronbach's alpha coefficient of .85 and test-retest reliability of .79. In the present study, Cronbach's alpha for the NGSE was .89.

Data analysis was conducted in two stages. In the preliminary stage, outlier screening, missing data management, and normality assumption checks were performed. In the main stage, Latent Profile Analysis (LPA) was utilized to identify distinct student subgroups. To determine the optimal number of profiles (latent classes), various models (from 2 to 6 classes) were fitted and

compared. The fit indices used included the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and sample-size adjusted BIC (aBIC), wherein lower values indicate better fit. Additionally, the Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT) was used to examine the significance of differences between models, and the Entropy index was used to evaluate classification precision (Alhadabi et al., 2023). Finally, differences among the extracted profiles regarding the outcome variable (procrastination) were tested using analysis of variance (ANOVA). Data were analyzed the open-source software R (R Core Team, 2020).

Results

In the preliminary stage, to examine outliers, manage missing data, and examine assumptions of normality, 35 questionnaires were excluded from the analysis process and statistical analyses were performed on 365 individuals. 365 (153 males and 212 females) individuals with a mean age of 21.28 and a standard deviation of 2.96 participated in this study. Nearly 94.2 percent of these students were single and most of them were studying at the undergraduate level (78.5%). Prior to conducting the Latent Profile Analysis (LPA), descriptive indices including means and standard deviations of the research variables were calculated (Table 1). The mean scores for decisional procrastination were 12.29 ($SD = 4.01$) and for general self-efficacy were 30.52 ($SD = 5.04$). Among perfectionism components, positive perfectionism ($M = 60.81$) had a higher mean than negative perfectionism ($M = 45.87$). Regarding metacognitive beliefs, the mean for negative beliefs about procrastination ($M = 21.97$) exceeded that of positive beliefs ($M = 13.93$). Examination of distribution indices (skewness and kurtosis) indicated that all variables fell within the normal range, confirming the assumptions necessary for parametric analyses.

Table 1. Descriptive Statistics of Research Variables

Variables	M	SD	Min	Max	Skewness	Kurtosis
Procrastination	12.29	4.01	5	24	.39	-.21
General Self-Efficacy(GSE)	30.52	5.04	15	40	-.01	-.07
Negative Metacognitive Beliefs(PMB)	21.97	5.38	8	53	.23	2.28
Positive Metacognitive Beliefs(NMB)	13.93	4.04	8	27	.44	-.45
Positive Perfectionism(PP)	60.81	10.09	33	80	-.29	-.51
Negative Perfectionism(NP)	45.87	9.86	17	71	.08	-.13

Pearson correlation coefficients were employed to examine preliminary relationships between indicator (predictor) variables and the criterion variable (decisional procrastination). The correlation matrix (Table 2) revealed significant relationships between variables. These significant correlations provided the necessary statistical basis for proceeding to LPA to identify underlying patterns among participants.

Table 2. Correlations between Predictor Variables and Procrastination

Variables	P	GSE	NMP	PMB	PP	NP
Procrastination	1	-.39**	.11*	.19**	-.20**	.36**
General Self-Efficacy(GSE)		1	.01	-.009	.37**	-.21**
Negative Metacognitive Beliefs(NMB)			1	-.31**	.15**	.25**
Positive Metacognitive Beliefs(PMB)				1	-.13*	.05
Positive Perfectionism(PP)					1	.30**
Negative Perfectionism(NP)						1

Note: ** $p < .01$, * $p < .05$

To identify the optimal number of latent profiles, a series of competing models (1- to 5-class models) were fitted using Robust Maximum Likelihood estimation. Several statistical fit indices were evaluated to determine the superior model, including AIC, BIC, sample-size adjusted BIC (SABIC), entropy, and the Bootstrap Likelihood Ratio Test (BLRT). The values for these indices across all fitted models are reported in Table 3.

Table 3. Fit Indices for Competing Latent Profile Analysis Models

Model	LL	AIC	BIC	SABIC	Entropy	BLRT(p)
1-Class	-2587	5194	5233	5201		
2-Class	-2549	5130	5192	5141	.51	.009
3-Class	-2530	5104	5190	5120	.56	.009
4-Class	-2501	5057	5166	5078	.59	.009
5-Class	-2486	5039	5172	5064	.62	.009

The results presented in Table 2 indicate that AIC and SABIC indices decreased continuously as the number of classes increased from 1 to 5. However, the BIC index, considered the most conservative and reliable indicator for preventing overfitting in latent class analysis, reached its minimum value in the 4-class model (5166) and subsequently increased in the 5-class model. This "elbow point" pattern in the BIC provided the initial statistical evidence for the adequacy of the 4-class model. Furthermore, BLRT results showed that the 4-class model was significantly better than the 3-class model ($p < .01$). Although the entropy index for this model was moderate (.59), given the appropriate class sizes (where the smallest class comprised more than 15% of the total sample), the distinctiveness of the patterns plotted in the profile diagram, and the significance of observed differences in the criterion variable (decisional procrastination), the 4-class model was selected as the final model for subsequent analyses. This selection aligns not only with statistical

indices but also with theoretical foundations in perfectionism and metacognition literature emphasizing the diversity of behavioral patterns among procrastinators.

Following the determination of the 4-class model as optimal, the characteristics of each profile were analyzed based on standardized means (Z-scores) of the five indicator variables (positive and negative perfectionism, positive and negative metacognitive beliefs, and general self-efficacy). Based on the configuration of these variables, the profiles were named and described as follows:

Profile 1: Adaptive/Self-Efficacious Pattern. This class, comprising 21% of participants, is characterized by high scores in positive perfectionism and general self-efficacy, and significantly low scores in negative perfectionism and negative metacognitive beliefs. Individuals in this profile possess high psychological resources and, despite striving for high standards, do not succumb to operational paralysis.

Profile 2: Maladaptive Perfectionists. This group (26% of the sample) exhibits a pattern of high negative perfectionism and negative metacognitive beliefs, while their self-efficacy scores are in the low-to-moderate range. The distinguishing feature of this profile is the conflict between moderate positive perfectionism and high negative perfectionism; their striving for progress is neutralized by intense fear of failure and negative beliefs regarding thought control.

Profile 3: Strategic/Justifying Procrastinators. This profile (34% of the sample) displays a unique pattern; these individuals score significantly higher on positive metacognitive beliefs than other groups. Despite moderate negative perfectionism, they believe procrastination helps them perform better under pressure. Self-efficacy in this group is moderate, suggesting a form of false confidence in time management.

Profile 4: Vulnerable/Avoidant Pattern. This group (19% of the sample) was identified as the "high-risk profile." It is characterized by the lowest level of general self-efficacy concurrent with the highest levels of negative perfectionism and negative metacognitive beliefs. In this "learned helplessness" pattern, the individual not only holds strict standards but also perceives a lack of necessary cognitive and emotional tools to face tasks, leading to the most severe form of avoidance.

To evaluate the construct validity of the identified profiles and examine their functional differences, "procrastination" was entered into the analysis as an external criterion variable. A one-way ANOVA was conducted to compare mean procrastination scores across the four latent profiles. The results indicated a statistically significant difference in procrastination levels among the four profiles, $(3,361) = 20.18, p < .001$. The effect size ($\eta^2 = .14$) suggests that profile membership explains a substantial portion of the variance in participants' procrastination. Tukey's HSD post-hoc test was used for precise pairwise comparisons (Table 4).

Table 4. Tukey Post-Hoc Results for Pairwise Comparisons of Procrastination across Profiles

Pairwise Comparison	Mean Difference	SE	Significance	95% Confidence Interval
2 vs 1	.62	.12	< .001	[.29, .96]
3 vs 1	.77	.13	< .001	[.41, 1.13]
4 vs 1	1.10	.14	< .001	[.71, 1.48]
3 vs 2	.14	.12	.671	[-.18, .48]
4 vs 2	.47	.13	.005	[.10, .83]
4 vs 3	.32	.14	.127	[-.05, .70]

Findings from the Tukey test (Table 4) revealed that Profile 1 (Adaptive/Self-Efficacious) had significantly lower procrastination than all other groups ($p < .001$). In contrast, Profile 4 (Vulnerable/Avoidant) experienced the highest level of procrastination, differing significantly from Profile 1 and Profile 2 ($p = .005$). Notably, although Profiles 2 and 3 did not differ significantly from each other ($p = .671$), both reported significantly higher procrastination than the adaptive group (Profile 1). Collectively, these findings confirm that distinct combinations of perfectionism, metacognition, and self-efficacy lead to varying levels of decisional helplessness. The significant differences observed in the criterion variable provide robust evidence for the construct and criterion validity of the extracted profiles, indicating their predictive utility in educational settings.

Discussion

The primary objective of the present study was to identify latent cognitive-emotional patterns among students based on the combination of perfectionism, metacognitive beliefs, and self-efficacy, and to examine the association of these patterns with the severity of academic procrastination. Unlike traditional approaches emphasizing linear relationships among variables (e.g., Anwar & Sitwat, 2024; Rad et al., 2025), this study adopted a person-centered approach to reveal the heterogeneity present within the student population. LPA led to the identification of four distinct subgroups of students, each exhibiting a unique combination of cognitive and emotional characteristics.

The first group, labeled the "Adaptive/Self-Efficacious Pattern," was characterized by high levels of positive perfectionism and self-efficacy, alongside low levels of negative perfectionism and negative metacognitive beliefs. As expected, and consistent with findings by Sederlund et al. (2020), members of this group reported the lowest rates of procrastination. This finding confirms that high standards per se do not lead to procrastination unless accompanied by deficits in self-efficacy and negative beliefs.

The second group, "Maladaptive Perfectionists," was identified by a distinct conflict between striving for progress and an intense fear of failure (high negative perfectionism) coupled with negative metacognitive beliefs. This group experienced higher levels of procrastination compared to the adaptive group, aligning with results from Gaikwad and Shukla (2025) regarding the detrimental role of concern over mistakes.

The third group, "Strategic/Justifying Procrastinators," was distinguished by prominent scores in positive metacognitive beliefs. These students believed that worry and time pressure enhance their performance. Although their level of procrastination did not differ significantly from maladaptive perfectionists, the nature of their procrastination was distinct, corresponding to the conceptual distinction between active and passive procrastination found in Fernie et al. (2017)

Finally, the fourth and most vulnerable group was termed the "Vulnerable/Avoidant Pattern," exhibiting the highest level of procrastination. The concurrent combination of severe negative perfectionism, high negative metacognitive beliefs (perceiving thoughts as dangerous), and the lowest level of self-efficacy in this group resulted in a state resembling learned helplessness. This finding aligns directly with the S-REF model and research by Mishra (2025), indicating that the sense of lack of control over thoughts, combined with weak self-efficacy, serves as the strongest predictor for decisional paralysis and chronic avoidance.

The four profiles identified in this research provide empirical confirmation of the multidimensional and heterogeneous nature of academic procrastination, demonstrating that this phenomenon is the product of varying combinations of cognitive and emotional vulnerabilities. The clear distinction between "Profile 1" (Adaptive Pattern) and the other profiles supports the theoretical distinction between adaptive and maladaptive perfectionism. As posited by Sederlund et al. (2020), perfectionism, when accompanied by high self-efficacy and a lack of self-criticism, not only avoids leading to procrastination but acts as a protective factor. Members of Profile 1, despite holding high standards (positive perfectionism), experienced the lowest procrastination due to high self-efficacy.

Regarding the question of whether a distinction can be made between a "perfectionist procrastinator" and a "low-confidence procrastinator," the findings offer a nuanced answer. "Profile 2" (Maladaptive Perfectionists) well represents the archetype of the "perfectionist procrastinator"—students whose procrastination is rooted in the gap between high standards and fear of mistakes (Gaikwad & Shukla, 2025). However, "Profile 4" (Vulnerable/Avoidant Pattern) represents a more severe combination that could be termed the "helpless procrastinator." In this group, maladaptive perfectionism is combined with the lowest level of self-efficacy. Consistent with Wardani et al. (2021) and Rad et al. (2025), this suggests that when an individual loses confidence in their ability to perform a task (low self-efficacy) while simultaneously perceiving the task as a threat (negative perfectionism), the most severe form of avoidance occurs.

One of the most significant findings of this study is the pivotal role of metacognitive beliefs in the severity of procrastination, aligning precisely with the predictions of the Self-Regulatory Executive Function (S-REF) model (Fernie et al., 2017). Comparison of "Profile 3" and "Profile 4" provides deep insight in this regard. Members of Profile 3 (Strategic Procrastinators), who held high positive metacognitive beliefs (believing "worry helps coping"), engaged in procrastination, yet its severity was not as high as in the vulnerable group. This accords with De Palo et al. (2017), who showed that certain metacognitive beliefs can create a false motivational function. In contrast, the most severe state of procrastination was observed in "Profile 4," characterized by the highest level of negative metacognitive beliefs (perceiving thoughts as dangerous and uncontrollable). This strongly confirms that negative beliefs about worry are the primary engine for chronic and debilitating procrastination. As demonstrated by Mishra (2025) and Malek (2022), when students feel they have no control over their negative thoughts and worries, their cognitive capacities become occupied, paralyzing the decision-making process. Thus, what distinguishes the most severely procrastinating group is not merely perfectionism or skill deficit, but their metacognitive belief in the "inability to control the mind," leading to a cognitive deadlock.

By identifying four distinct profiles, this study provides robust evidence supporting the multidimensional and heterogeneous nature of procrastination. Contrary to traditional approaches viewing procrastination as a monolithic construct, LPA results showed that students might exhibit similar levels of overt procrastination while possessing entirely different underlying mechanisms. For instance, the qualitative difference between "Profile 3" (Strategic Procrastinators with positive metacognition) and "Profile 4" (Vulnerable Pattern with negative metacognition) is supported by the findings of Gross et al. (2024) stating that procrastination does not necessarily stem from laziness but can arise from different motivational and cognitive configurations. This heterogeneity explains why prior variable-centered studies (e.g., Safari & Yousefpour, 2022) have sometimes reported contradictory results; they amalgamated the opposing effects of these subgroups into a general mean.

This study confirms the validity of the S-REF model in explaining academic delay. According to this model, positive and negative metacognitive beliefs activate different pathways into the Cognitive Attentional Syndrome (CAS) and procrastination (Fernie et al., 2017). The presence of "Profile 3," characterized by high positive metacognitive beliefs ("worry helps coping"), confirms the pathway of intentional or strategic procrastination where the individual uses time pressure as a motivational tool. Conversely, "Profile 4," dominated by negative metacognitive beliefs ("my thoughts are uncontrollable"), demonstrated the pathway of avoidant and paralyzing procrastination. These findings, consistent with those of Mishra (2025), suggest that the S-REF model offers a powerful framework for differentiating types of procrastination based on the type of metacognitive beliefs activated in the students' mind.

The identification of distinct profiles indicates that a "one-size-fits-all" approach to treating procrastination is inefficient, and interventions must be designed based on the specific cognitive-emotional profile of each group:

Intervention for Profile 2 (Maladaptive Perfectionists): For this group struggling with the gap between standards and fear of failure, interventions should focus on managing perfectionism. Cognitive-Behavioral Therapy (CBT) aimed at modifying unrealistic standards and reducing self-criticism, as suggested by Anwar and Sitwat (2024) as well as Gaikwad and Shukla (2025), can help break the anxiety-avoidance cycle.

Intervention for Profile 3 (Strategic Procrastinators): The main issue for this group lies in erroneous positive metacognitive beliefs regarding the utility of worry. Therefore, Metacognitive Therapy (MCT) is essential to challenge the belief that "I only work well at the last minute." As De Palo et al. (2017) showed, time management training alone is insufficient for this group; their underlying beliefs about the function of worry must be corrected.

Intervention for Profile 4 (Vulnerable/Avoidant Pattern): As the highest-risk profile, this group requires multifaceted interventions with a special focus on enhancing "self-efficacy." Since severe deficits in belief in one's abilities are the primary driver of avoidance here (Wardani et al., 2021), utilizing strategies to experience small successes and cognitive restructuring to reduce feelings of helplessness and increase the sense of control over thoughts is vital (consistent with Rad et al., 2025).

Reinforcing Profile 1 (Adaptive Pattern): Recognizing the characteristics of this group (integrating high standards with self-efficacy) can serve as a model for educational programs in universities to demonstrate how academic success can be achieved without sacrificing mental health (Sederlund et al., 2020).

Despite valuable findings in identifying four distinct cognitive-emotional profiles, results must be interpreted in light of several limitations. First, the current research design was cross-sectional. Although LPA allows for the identification of variable clustering, the correlational nature of the data precludes causal inferences. For instance, in "Profile 4" (Vulnerable/Avoidant), it is unclear whether low self-efficacy led to the formation of negative metacognitive beliefs or vice versa. As Rad et al. (2025) noted, without longitudinal data, the precise direction of reciprocal effects among cognition, emotion, and procrastinating behavior cannot be determined. Second, the data relied on self-report measures. This increases the likelihood of response biases, particularly social desirability. Kathleen and Basaria (2021) showed that students might underreport the true extent of procrastination or anxiety derived from perfectionism to maintain their social image. This is particularly true for "Profile 3" (Strategic Procrastinators), where high reporting of positive metacognitive beliefs might be a defense mechanism to justify procrastinating behavior rather than

a functional reality. Third, the demographic characteristics of the sample were limited to university students, which may challenge the generalizability of results to other age groups or different cultural contexts. Ashraf et al. (2023) emphasized that cultural factors play a moderating role in the relationship between perfectionism and procrastination; thus, the identified profiles might have different configurations in non-academic populations or different cultural contexts (non-WEIRD).

Based on the stated limitations and extracted profiles, the following directions are proposed for future research. Conducting longitudinal research to examine the stability of the four profiles over time is essential. Gross et al. (2024) suggest that examining profile changes over an academic term can reveal whether students in "Profile 3" (Strategic Procrastinators) drift toward "Profile 4" (Vulnerable) as time passes and academic pressure increases. Understanding this developmental trajectory is critical for preventing the chronicity of procrastination. Future research should examine the effectiveness of psychological interventions tailored to each profile within experimental designs. For example, designing an intervention study using perfectionism-focused CBT for "Profile 2" (Anwar & Sitwat, 2024) and self-regulation and self-efficacy training for "Profile 4" (Wardani et al., 2021) could confirm the clinical validity of this classification. It is suggested that future studies investigate the role of contextual variables such as educational climate or parenting styles in the formation of these profiles. As Anwar and Sitwat (2024) showed, parenting styles can predict maladaptive perfectionism; thus, examining which parenting style leads to membership in the "Adaptive Profile" versus the "Vulnerable Profile" could have significant preventive implications.

Conclusion

The findings of this research challenge the traditional view of academic procrastination, confirming that this behavior is not a "one-size-fits-all" or homogeneous phenomenon but a multifaceted construct with diverse cognitive and emotional roots. The identification of four distinct profiles (from Adaptive to Vulnerable) demonstrates that procrastination is the product of a complex and unique interaction among "perfectionism, metacognitive beliefs, and self-efficacy" within each individual. By highlighting the critical role of negative metacognitive beliefs and self-efficacy deficits in forming the most severe type of delay (Profile 4), this study confirms that the psychological mechanisms leading to delay in a "Strategic Procrastinator" are entirely different from those in a "Helpless Procrastinator" (Fernie et al., 2017; Mishra, 2025). Therefore, the central message of this research is that a precise understanding of the student's specific "cognitive-emotional profile" is a necessary prerequisite for explaining and treating procrastinating behavior. Clinical and educational interventions must move away from generic approaches and be designed and implemented to address the specific deficits of each profile—whether correcting erroneous metacognitive beliefs or enhancing self-efficacy (Rad et al., 2025; Wardani et al., 2021).

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Data available on request from the authors.

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Ethical considerations

The authors avoided data fabrication and falsification.

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Conflict of interest

There are no conflicts of interest.



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