The Role of Mindfulness and General Self-Efficacy in Predicting Academic Procrastination Among University Students: A Comparative Analysis Across Gender, University Type, and Educational Level

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Abstract

Academic procrastination is a widespread issue among university students, particularly in contexts characterized by academic pressure and limited autonomy. This study aimed to examine the predictive roles of mindfulness and general self-efficacy on academic procrastination among Egyptian university students and to explore differences based on gender, university type, and educational level.

The study sample comprised 563 Egyptian students (314 females and 249 males), including both undergraduate and postgraduate participants, drawn from public and private universities. Students ranged in age from 18 to 26 years and represented a range of academic disciplines.

Three validated self-report instruments were used: the Arabic-adapted Academic Procrastination Scale, the General Self-Efficacy Scale, and the Mindfulness Attention Awareness Scale. Descriptive statistics, Pearson correlation coefficients, and multiple linear regression analyses were conducted to test the study's hypotheses.

Results indicated that both mindfulness and self-efficacy significantly and negatively predicted academic procrastination. Higher levels of these traits were associated with lower levels of procrastination. Gender differences were observed, with male students reporting higher procrastination levels than females. No significant differences emerged based on university type or education level.

The findings highlight the relevance of enhancing mindfulness and self-efficacy in intervention strategies aimed at reducing academic procrastination among university students in Egypt.

Keywords: university students, academic procrastination, General self-efficacy, mindfulness.

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Introduction:

Procrastination is a widespread phenomenon that transcends cultural boundaries and has been a persistent companion of human existence (Ferrari, Johnson, & McCown, 1995). It is easily observable across all segments of society, regardless of age, gender, or educational background (Steel, 2007). Procrastination is not limited to a specific age group or demographic; it is prevalent among both young and old, males and females, educated and uneducated individuals alike. The act of postponing tasks and decisions has become a significant challenge for individuals and societies, often indicating a failure in time management (Balkis & Duru, 2009).

Procrastination can extend to various aspects of daily life, referred to as "general procrastination." On the other hand, "academic procrastination" represents a specific type of general procrastination, characterized by the daily postponement of academic tasks, such as assignments, exam preparation, or research projects (Solomon & Rothblum, 1984). Academic procrastination is prevalent across all ages and educational levels and affects both genders. Both general and academic procrastination can be conceptualized as a failure of self-regulation, meaning the inability of an individual to exercise control over their thoughts, emotions, motivations, and actions (Steel, 2007).

Academic procrastination is commonly understood as the intentional postponement of academic responsibilities, even when the individual foresees potential negative outcomes (Steel, 2007). This behavior is widely observed among students at various educational levels and is

often linked to detrimental consequences such as decreased academic achievement, heightened stress and anxiety, and diminished psychological well-being (Kim & Seo, 2015; Tice & Baumeister, 1997). Identifying the underlying causes of academic procrastination is vital for developing effective strategies to reduce its harmful impact.

Over the past few years, research has increasingly focused on how psychological attributes like mindfulness and self-efficacy influence procrastination tendencies. Mindfulness, described as intentional and accepting awareness of present experiences (Kabat-Zinn, 1990), has been shown to help reduce procrastination in several contexts (Howell & Watson, 2007). Self-efficacy, or the confidence in one's capability to complete tasks effectively (Bandura, 1997), is also associated with lower levels of procrastination (Wolters, 2003).

Various scholars have defined academic procrastination differently. For example, Oppen (1998) defines it as delaying academic tasks in a way that they remain unfinished within the allotted time, often resulting in hurried efforts before deadlines. It is also viewed as a failure to initiate or complete academic duties promptly, thereby pushing the task to a future point in time (Haycock et al., 1998). Several researchers (Walsh & Ugumba-Agwunobi, 2002; Grunschel et al., 2013; Chow, 2011;) agree that procrastination is a deliberate tendency among students to waste time and postpone the start of an academic task with a specific timeframe until a later time, leading to harmful consequences such as unsatisfactory performance and anxiety, despite the individual's awareness of these negative consequences (Chu & Choi, 2005). Cao (2012) also views academic procrastination as "the lack of self-regulated performance of academic tasks and the individual's tendency to avoid performing an academic activity, even though they can do it in the present. It is also the student's postponement of a task without justification, despite the importance and necessity of that task."

In the Egyptian context, academic procrastination is particularly significant given the educational system’s reliance on rote learning, centralized assessments, and teacher-centered instruction, which can limit students’ sense of autonomy and engagement (Abouserie, 1994; Megahed & Ginsburg, 2008). Cultural factors, such as collectivist family structures, strong parental expectations, and traditional gender norms may further shape students’ academic behavior and emotional regulation (Hofstede, 2001; El-Mougy, 2013). These dynamics can

create conflicting pressures that contribute to avoidance tendencies like procrastination. Despite these realities, few empirical studies have contextualized academic procrastination within the Egyptian cultural and educational landscape, leaving a notable gap that this study seeks to address.

Literature Review

Academic procrastination

Academic procrastination is commonly regarded as a type of failure in self-regulation, often characterized by the unnecessary and intentional delay in completing academic tasks, even when such postponement is expected to lead to undesirable consequences (Steel, 2007). Research suggests that approximately 20% of individuals habitually engage in procrastination across different life areas, with over half of university students expressing a desire to reduce their academic procrastination (Steel, 2007; Kim & Seo, 2015).

Although procrastination is a global issue, research comparing cross-cultural patterns has yielded mixed outcomes. For instance, one international comparison found that students in the UK reported higher levels of procrastination than those in the U.S. or Australia, suggesting a potentially stronger presence of this behavior in Western societies (Ferrari, O'Callaghan, & Newbegin, 2005). Conversely, other cross-national analyses reported minimal differences; for example, one study involving Ukrainian and Slovak students found similar procrastination tendencies between the two groups (Zimbardo et al., 1999).

Further supporting this notion, a meta-analysis of 193 studies concluded that procrastination is consistently observed across a wide range of cultures and national backgrounds, with little variation in tendencies between Chinese students and their international peers (Zhang et al., 2022). However, the same analysis did reveal a modest but statistically significant gender disparity, with male students generally procrastinating more than females in both academic and general settings (Steel & Ferrari, 2013).

Overall, existing research suggests that academic procrastination is a widespread behavior that transcends cultural, national, and demographic boundaries. As emphasized by Steel (2007) in his comprehensive meta-analytic review, procrastination tends to operate as a stable personality-like trait, showing a high degree of consistency across diverse groups and environments.

The pervasive nature of academic procrastination is particularly concerning due to its well-documented negative consequences. Meta-analytic research has consistently found that procrastination is significantly associated with lower academic achievement. For instance, Kim and Seo (2015) reported a substantial negative correlation between procrastination and grade performance, while also noting considerable variation across studies, suggesting that contextual factors such as culture or assessment type may moderate this relationship. Beyond academic outcomes, procrastination has been linked to heightened stress, poorer psychological well-being, and greater incidence of health issues among students (Sirois & Pychyl, 2013; Tice & Baumeister, 1997). Steel's (2007) influential meta-analysis of over 690 effect sizes further identified key correlates of procrastination, highlighting strong associations with task-related characteristics particularly high task aversiveness and long task delay as well as with individual differences such as low self-efficacy, impulsiveness, poor self-control, and low conscientiousness. Taken together, these findings portray procrastination as both a consequence and a cause of impaired self-regulation, contributing to a cycle that undermines students' academic success and overall well-being. These insights underscore the necessity of identifying modifiable psychological factors particularly mindfulness and self-efficacy that may help protect against procrastinatory behavior (Sirois & Tosti, 2012; Glick & Orsillo, 2015).

Mindfulness

Mindfulness is a multifaceted construct that includes skills such as observing internal experiences, acting with awareness, and accepting thoughts and feelings without judgment (Baer et al., 2006). Among these, two specific facets. Acting with Awareness and Non-Judging (Acceptance)are most consistently linked to reduced procrastination. Acting with awareness refers to consciously attending to one's present

actions, in contrast to functioning on automatic mode. Students high in this trait are better at avoiding distractions and are more likely to initiate and maintain focus on academic tasks (Przepiorka et al., 2019). Empirical research suggests that acting with awareness significantly predicts timely task initiation and sustained attention, even after controlling personality traits such as impulsivity (Glick & Orsillo, 2015).

The non-judging facet reflects an individual's ability to acknowledge difficult thoughts or feelings without engaging in self-criticism or avoidance. This is particularly relevant for procrastination, which often stems from negative self-evaluations and attempts to escape task-related anxiety or shame (Sirois & Tosti, 2012). Students with high levels of acceptance are more likely to tolerate discomfort related to challenging academic tasks and are less inclined to use procrastination as a short-term emotion regulation strategy (Cheung & Ng, 2019).

Through these mechanisms, mindfulness can reduce procrastination by enhancing attentional control and emotional regulation core components of self-regulation. It disrupts the maladaptive cycle in which students seek immediate emotional relief through delay at the expense of long-term goals. Supporting this framework, several mediation studies have explored how mindfulness exerts its influence. For example, Sirois and Tosti (2012) found that mindfulness reduced procrastination partly by lowering maladaptive perfectionism, a known emotional antecedent of procrastination. Similarly, other studies have reported that mindfulness reduces performance anxiety, which in turn decreases procrastinatory behavior (Sirois & Tosti, 2012; Hanley et al., 2015).

Collectively, this evidence suggests that mindfulness strengthens students' capacity to manage both attentional and emotional challenges, thereby protecting against procrastination. By promoting present-focused awareness and non-reactive acceptance, mindfulness offers a powerful tool for enhancing academic self-regulation.

Alongside mindfulness, self-efficacy defined as one's belief in their ability to organize and execute the actions necessary to achieve desired outcomes has been consistently identified as a key psychological

determinant of academic procrastination (Bandura, 1997). A substantial body of research demonstrates a clear pattern: students with higher academic self-efficacy are significantly less likely to procrastinate, whereas those with low self-efficacy tend to delay academic tasks more frequently. Meta-analytic findings by Steel (2007) confirm that low self-efficacy ranks among the most robust correlates of procrastination, on par with impulsivity and poor self-control.

Conceptually, self-efficacy mitigates procrastination through several mechanisms. Students with high self-efficacy experience a heightened sense of agency and confidence in their academic capabilities, which fosters motivation to initiate tasks promptly and persist in the face of difficulty (Klassen et al., 2008). These students are less susceptible to fear of failure and are better equipped to manage task-related stress, thus reducing hesitation and avoidance. Conversely, individuals with low self-efficacy often harbor doubts about their abilities, which can lead to performance anxiety, negative self-appraisals, and avoidance behaviors. The anticipation of failure may prompt such individuals to postpone tasks as a temporary means of emotional relief (Sirois, 2004).

Empirical studies support these theoretical pathways. Longitudinal and experimental evidence suggests that self-efficacy enhances both task initiation and persistence under challenging conditions (Valenzuela et al., 2020). High self-efficacy is also associated with improved motivational regulation, better planning strategies, and resilience in academic settings (Kim & Seo, 2015). These attributes reduce reliance on procrastination as a maladaptive coping mechanism, as confident students perceive tasks as manageable and are more inclined to engage with them proactively. Conversely, low-efficacy students are more likely to engage in procrastination as a form of self-handicapping, reinforcing a negative cycle of underperformance and declining confidence (Klassen et al., 2008).

Importantly, interventions aimed at enhancing self-efficacy such as those that provide mastery experiences, model successful task completion, and offer positive feedback have been shown to significantly reduce procrastination behaviors (Rahmawati & Fadlilah, 2019). These findings, when considered alongside the evidence on mindfulness, highlight the value of strengthening both self-belief and present-focused awareness to support students in overcoming procrastinatory habits.

In addition to psychological predictors, researchers have explored whether certain demographic characteristics are linked to increased procrastination. Gender differences have been widely examined, with some studies suggesting that male students are more likely to procrastinate than female students, potentially due to differing socialization patterns and risk-taking tendencies (Steel & Ferrari, 2013). However, other analyses indicate that once psychological traits such as conscientiousness and self-efficacy are accounted for, gender-related differences in procrastination tend to diminish or become statistically insignificant (Lu et al., 2022).

Academic level appears to be a more meaningful demographic predictor. Undergraduate students typically exhibit higher rates of procrastination compared to postgraduate students, a pattern attributed to undergraduates' developing self-regulatory capacities and lesser experience with independent academic tasks (Zhang et al., 2022). Younger students may struggle more with time management and task structuring, leading to greater susceptibility to delay. Studies have shown that procrastination rates tend to decline as students advance through higher levels of study, likely reflecting the acquisition of better coping and planning skills over time (Rahmawati & Fadlilah, 2019).

Other demographic variables, such as institutional type (public vs. private university) and cultural background, generally exhibit inconsistent associations with procrastination unless these are tied to substantially different educational environments or learning cultures. Crucially, when both psychological and demographic predictors are examined together in regression models, psychological variables such as mindfulness and self-efficacy typically account for substantially more variance in procrastination (Valenzuela et al., 2020). For example, a large-scale study demonstrated that once self-efficacy and impulsivity were controlled for, demographic factors such as age and gender contributed minimally to the prediction of procrastination.

In line with this growing body of evidence, the current study posits that psychological traits particularly mindfulness and self-efficacy serve as the primary determinants of academic procrastination, while demographic factors may exert only secondary or moderating effects.

This underscores the importance of targeting internal self-regulatory processes in efforts to mitigate procrastinatory behavior among students.

Self-Efficacy

In addition to mindfulness, self-efficacy commonly defined as one's confidence in organizing and executing actions required to reach desired outcomes has been consistently recognized as a critical psychological factor influencing academic procrastination (Bandura, 1997). Numerous studies confirm a consistent pattern: students with strong academic self-efficacy are considerably less prone to procrastinate, while those with low self-efficacy are more likely to delay their academic responsibilities. According to a comprehensive meta-analysis by Steel (2007), self-efficacy stands out as one of the most significant predictors of procrastination, comparable in influence to traits like impulsivity and poor self-regulation.

Theoretically, self-efficacy reduces procrastination through various psychological mechanisms. Learners with high self-efficacy typically demonstrate a strong belief in their academic capabilities, which enhances their motivation to begin tasks without delay and persevere through challenges (Klassen et al., 2008). These individuals are generally less overwhelmed by fear of failure and are more emotionally prepared to cope with academic stress, leading to reduced avoidance behaviors. In contrast, those with lower self-efficacy often question their abilities, which can result in negative self-perceptions, heightened anxiety, and a tendency to avoid tasks. The expectation of failure may lead these students to delay tasks as a way of managing emotional distress (Şirin, 2011).

Supporting these theoretical links, empirical research both longitudinal and experimental indicates that self-efficacy plays a significant role in boosting students' willingness to initiate and sustain effort under demanding conditions (Valenzuela et al., 2020). Elevated self-efficacy is also tied to enhanced academic performance and better emotional outcomes.

High self-efficacy is also associated with improved motivational regulation, better planning strategies, and resilience in academic settings (Kim & Seo, 2015). These attributes reduce reliance on procrastination as a maladaptive coping mechanism, as confident students perceive tasks as manageable and are more inclined to engage

with them proactively. Conversely, low-efficacy students are more likely to engage in procrastination as a form of self-handicapping, reinforcing a negative cycle of underperformance and declining confidence (Klassen et al., 2008).

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Social Cognitive Theory (SCT), Self-Efficacy and Self-Regulation:

The investigation is anchored in Albert Bandura's Social Cognitive Theory (SCT), which highlights the dynamic interplay of personal factors, behaviors, and environmental influences in shaping human functioning. Within this framework, self-efficacy is identified as a central personal factor influencing how individuals perceive tasks, their level of motivation, and the effort they invest in achieving goals (Bandura, 1986, 1997). According to SCT, individuals with high self-efficacy are more likely to set challenging goals, exert sustained effort, and persist in the face of adversity. Conversely, those with low self-efficacy are prone to avoidance, reduced persistence, and diminished performance.

In academic contexts, self-efficacy plays a pivotal role in self-regulation. Bandura (1991) emphasized that self-efficacy influences the processes of self-monitoring, self-judgment, and self-reaction, which together constitute the mechanisms of self-regulated behavior. When students believe they can succeed in a task, they are more likely to monitor their progress, evaluate their performance against set standards, and adjust their strategies accordingly. This fosters proactive academic behaviors, such as timely initiation of assignments and consistent engagement with learning tasks (Zimmerman, 2000). In contrast, low self-efficacy disrupts these self-regulatory processes by undermining motivation and increasing vulnerability to negative emotions like

anxiety and frustration, which are known antecedents of procrastination (Sirois & Pychyl, 2013).

From the SCT perspective, procrastination can be conceptualized as a breakdown in the self-regulatory system, rooted in weakened beliefs about personal efficacy. A student lacking confidence may delay academic tasks to avoid the anticipated discomfort of failure, thereby reinforcing maladaptive avoidance patterns. On the other hand, a student with high self-efficacy is more likely to approach tasks assertively, manage emotional responses effectively, and maintain steady progress toward academic goals.

This study extends SCT by integrating mindfulness as an additional personal factor that may enhance self-regulation. Mindfulness, through its promotion of attentional control and emotional acceptance, may complement self-efficacy by creating the mental conditions necessary for successful self-monitoring and adaptive learning behaviors. In line with Bandura's proposition that cognitive and affective processes jointly influence behavior, examining both mindfulness and self-efficacy offers a more comprehensive understanding of how internal resources support academic performance and reduce procrastination (Bandura, 1997; Gross, 2014).

Emotion Regulation Theory, Procrastination as Emotional Coping:

Procrastination has increasingly been conceptualized through the lens of emotion regulation theory, particularly Gross's process model of emotion regulation. Gross (1998, 2014) proposed that individuals regulate their emotional responses using strategies that operate at various stages of the emotion-generative process, including situation selection, attentional deployment, cognitive change, and response modulation. Within this framework, procrastination is interpreted as a maladaptive emotion regulation strategy wherein individuals delay or avoid aversive academic tasks to momentarily alleviate negative emotional states such as anxiety, frustration, or fear of failure (Sirois & Pychyl, 2013).

This delay provides short-term emotional relief but undermines long-term academic goals. Procrastinators typically engage in situation modification delaying the task to escape immediate discomfort, despite the subsequent increase in stress as deadlines approach. This aligns with the concept of emotion-focused coping, where the individual prioritizes regulating their internal state over addressing the external demands of

the task. Gross's model highlights the counterproductive nature of this strategy: while avoidance temporarily reduces emotional distress, it often results in heightened stress and guilt later on, reinforcing the procrastination cycle (Gross, 1998).

Within this theoretical lens, mindfulness represents a constructive alternative. Mindfulness promotes adaptive emotion regulation by encouraging individuals to adopt non-reactive, non-judgmental awareness of their emotional experiences (Baer et al., 2006). Rather than avoiding unpleasant emotions, mindful individuals learn to accept them and remain present, thereby reducing the compulsion to procrastinate as a form of emotional escape. This approach aligns with Gross's notion of antecedent-focused strategies such as cognitive reappraisal which are generally more effective than response-focused avoidance.

For example, a mindful student might acknowledge feelings of anxiety about an impending assignment and still choose to begin the work, using techniques such as reframing the task or engaging in calming practices like deep breathing. Empirical research supports this regulatory benefit of mindfulness. Neurocognitive studies show that mindfulness training is associated with reduced activation in brain areas involved in stress responses (e.g., amygdala) and increased activation in regions related to cognitive control (e.g., prefrontal cortex), indicating enhanced emotional regulation capacity (Hölzel et al., 2011). Furthermore, dispositional mindfulness has been linked to lower procrastination tendencies through mechanisms such as reduced avoidance motivation and greater emotional tolerance (Sirois & Tosti, 2012; Glick & Orsillo, 2015). Mediation studies indicate that mindfulness may reduce procrastination indirectly by decreasing maladaptive emotion regulation tendencies, including suppression and rumination (Hanley et al., 2015).

In sum, emotion regulation theory provides a compelling framework for understanding procrastination not simply as a time management issue, but as a failure to regulate emotional distress. Mindfulness serves as a corrective mechanism by enabling students to face, rather than flee, aversive academic emotions. This reinforces the broader theoretical

proposition that enhancing emotion regulation capacity is key to reducing procrastinatory behavior, positioning mindfulness-based approaches as viable interventions in academic settings.

Motivational Theories, Expectancy-Value and Temporal Motivation:

Procrastination can also be examined through the lens of classic motivational theories, particularly Expectancy-Value Theory (E-V) and Temporal Motivation Theory (TMT). Expectancy-Value Theory posits that the motivation to engage in a task depends on the individual's belief in their likelihood of success (expectancy) and the subjective importance or desirability of the task (value) (Eccles & Wigfield, 2002). When either expectancy ("Can I do this?") or value ("Is this important to me?") is low, motivation tends to decline, increasing the probability of delay or avoidance. Academic procrastination often occurs in contexts where students perceive low expectancy (e.g., low academic self-efficacy) or low value (e.g., boredom or irrelevance), or both.

For instance, a student who doubts their ability to write a strong research paper and simultaneously finds the topic unengaging is likely to lack sufficient motivation to initiate the task, heightening the risk of procrastination. From this perspective, strengthening students' self-efficacy may raise expectancy, while enhancing task relevance or meaning may increase perceived value, both of which reduce procrastination (Kim & Seo, 2015; Klassen et al., 2008). Moreover, mindfulness may contribute by increasing task value, not necessarily through external rewards, but by helping students become more attuned to the intrinsic satisfaction of engaging with the present task, thereby increasing task engagement (Sirois & Tosti, 2012).

Building on E-V Theory, Temporal Motivation Theory (TMT) integrates temporal and personality-based dimensions into the motivational equation. TMT, introduced by Steel and König (2006), formalizes motivation as a function of expectancy and value divided by the product of impulsiveness and delay. The formula captures the intuition that even highly valued tasks may fail to motivate action when the deadline is distant, or the individual is highly impulsive. As the deadline approaches, the delay term shrinks, and motivation rises sharply explaining the common experience of last-minute effort surges among procrastinators.

TMT provides a comprehensive model that aligns with empirical findings. For example, procrastination is most likely when expectancy is low (e.g., students lack confidence), value is low (e.g., task seems irrelevant), and either impulsiveness is high, or the deadline is far off (Steel, 2007). The model helps explain why impulsivity and task aversiveness are among the strongest predictors of procrastination and why enhancing self-efficacy boosting expectancy is an effective strategy to mitigate delays (Steel & Ferrari, 2013).

In the context of this study, TMT offers a valuable framework for understanding the joint roles of mindfulness and self-efficacy. Mindfulness can help reduce impulsiveness and increase present-moment awareness, thereby mitigating temporal discounting. It can also help students reframe academic tasks, increasing intrinsic value through cognitive reappraisal and acceptance (Glick & Orsillo, 2015). Meanwhile, self-efficacy directly enhances expectancy. Together, these constructs contribute to higher task utility and reduce the motivational barriers that lead to procrastination.

By integrating these motivational theories with Social Cognitive Theory and Emotion Regulation Theory, this study proposes a comprehensive framework in which mindfulness and self-efficacy serve as complementary psychological resources. Self-efficacy fosters motivational confidence and goal commitment, while mindfulness supports emotional resilience and attentional control. These mechanisms operate across cognitive, emotional, and temporal domains to reduce academic procrastination. Demographic factors, while considered, are hypothesized to play only a minor moderating role in comparison to these central psychological constructs.

Study Question

To what extent do mindfulness and self-efficacy predict academic procrastination among university students, and how do these relationships vary by gender and university type?

Methodology

Research Design and Participants. This study employed a quantitative, cross-sectional, correlational research design to explore the extent to which mindfulness, self-efficacy, and demographic factors predict academic procrastination among university students. The design was non-experimental, allowing the researcher to observe naturally occurring differences among variables without manipulation, thereby ensuring ecological validity within a real-world student context.

Participants were recruited from several Egyptian universities using a convenience sampling strategy. The final sample consisted of 563 undergraduate students, approximately 8% of whom were male and 92% female. The mean age of participants was 19.8 years (SD = 1.65), representing a typical late-adolescent population. To enhance generalizability, students were drawn from both public and private institutions, encompassing a range of academic majors and year levels (from first year to senior).

Prior to administering the main survey, a pilot study was conducted with 100 students to evaluate the clarity, cultural appropriateness, and psychometric properties of the instruments. Based on the pilot feedback, minor linguistic adjustments were made to improve comprehension. Participation was voluntary, informed consent was obtained, and the study adhered to ethical research guidelines including anonymity and confidentiality.

Data Collection Procedure. Data was gathered via online survey forms, disseminated through institutional learning platforms and student-focused social media channels. After securing ethical clearance and participant consent, respondents were provided access to the survey, which presented the measures in a fixed order: academic procrastination, mindfulness, self-efficacy, and demographic information. This ordering was chosen to reduce priming effects by placing procrastination first to capture spontaneous responses uninfluenced by prior items.

Instruments

The study utilized four self-report scales, each adapted or developed to align with the cultural and linguistic context of the participants:

1. **Academic Procrastination Scale**
   The scale was translated and psychometrically validated into Arabic by **Tamer Shawky Ibrahim (2014)**. The author

conducted a confirmatory factor analysis (CFA) using **Mplus Version 7**, assuming a two-factor structure aligned with the latent dimensions of academic procrastination. Results confirmed adequate model fit and significant factor loadings, supporting the scale's factorial validity for use with Arabic-speaking university students.

Confirmatory Factor Validity:

Using the statistical analysis program **Mplus Version 7**, the researcher conducted a Confirmatory Factor Analysis (CFA), assuming the presence of two correlated latent factors on which the scale items were loaded. Table (1) presents both the standardized and unstandardized regression weights for item loadings on the latent factors, along with their statistical significance. Table (2) displays the fit indices for the proposed model of the **Academic Procrastination Scale** and their interpretation. Figure (1) illustrates the proposed factor structure of the scale.

Table (1)
Standardized and Unstandardized Regression Weights of Item Loadings on the Latent Factors of the Academic Procrastination Scale Derived from the Confirmatory Factor Analysis (CFA), and Their Statistical Significance

Factor	Item No.	Standardized Regression Weight	Unstandardized Regression Weight	Standard Error	Critical Ratio	Significance
Wasting Time Uselessly	1	1.00	0.00	0.041	—	—
	2	0.42	0.634	0.06	6.68	0.01
	3	1.05	0.297	0.08	13.90	0.01
	4	1.13	0.659	0.08	13.70	0.01
	5	0.34	0.663	0.07	4.98	0.01
	6	1.23	0.221	0.08	14.54	0.01
	7	1.28	0.715	0.08	15.27	0.01
	8	1.17	0.749	0.08	14.02	0.01
	9	0.54	0.688	0.06	8.94	0.01
	10	0.49	0.406	0.06	7.92	0.01
	11	0.48	0.359	0.08	6.37	0.01
	12	1.11	0.283	0.08	14.70	0.01
	13	1.01	0.715	0.08	12.96	0.01
	14	1.18	0.623	0.08	14.94	0.01
	15	1.19	0.743	0.08	14.91	0.01
	16	1.39	0.731	0.09	16.11	0.01
	17	1.14	0.815	0.08	14.26	0.01
Failure to Meet Deadlines	18	1.00	0.00	0.043	—	—
	19	0.919	0.708	0.061	15.17	0.01
	20	1.054	0.688	0.062	16.88	0.01
	21	0.925	0.773	0.065	14.12	0.01
	22	0.982	0.661	0.064	15.33	0.01

Table (1) shows that all items on the scale were statistically significant at the 0.01 level. The standardized and unstandardized loadings confirm the strength of each item's association with its respective latent factors.

Table (2) (not shown here) presents the model fit indices for the proposed two-factor structure of the Academic Procrastination Scale.

Table (2)
Model Fit Indices for the Proposed Structure of the Academic Procrastination Scale

Fit Index	Value	Ideal Range
Chi-Square (CMIN)	622.91	—
Significance Level	0.000	Significant at the 0.01 level
Degrees of Freedom (DF)	231	—
CMIN/DF Ratio	2.697	Ideal range: 1 to 3
Goodness of Fit Index (GFI)	0.84	Closer to 1 indicates better fit
Normed Fit Index (NFI)	0.77	Closer to 1 indicates better fit
Incremental Fit Index (IFI)	0.76	Closer to 1 indicates better fit
Expected Cross-Validation Index (ECVI) – proposed	0.74	Lower than saturated model indicates better fit
Expected Cross-Validation Index (ECVI) – saturated	0.77	—
Comparative Fit Index (CFI)	0.779	Closer to 1 indicates better fit
Root Mean Square Error of Approximation (RMSEA)	0.011	Closer to 0 indicates better fit
Tucker–Lewis Index (TLI)	0.754	Closer to 1 indicates better fit

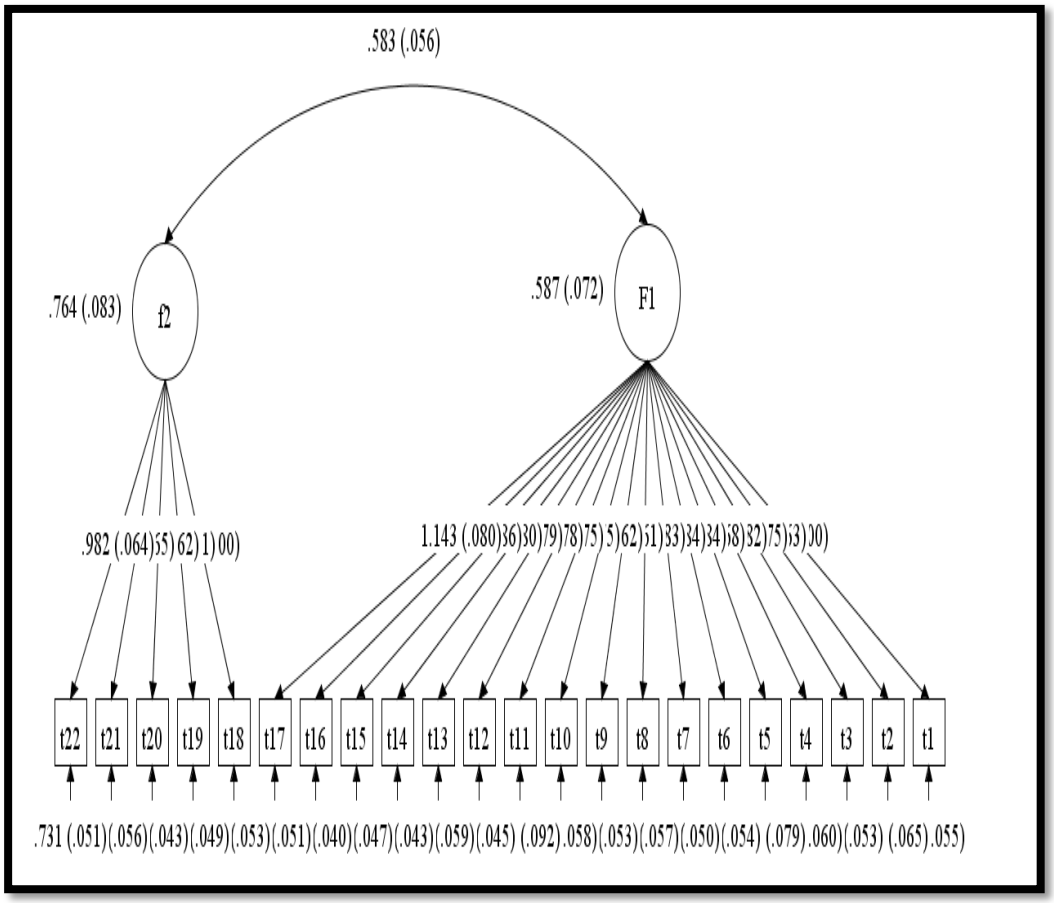
As shown in Table (2), the Confirmatory Factor Analysis (CFA) model demonstrates acceptable fit, supporting a two-factor structure of the Academic Procrastination Scale:

F1: Wasting Useless Time

F2: Failure to Meet Deadlines

Most indices fall within or close to their optimal range, confirming the factorial validity of the proposed model. Additionally, Figure (1) in the original paper illustrates the hypothesized factor structure of the scale.

Figure (1)
The Proposed Factor Structure of the Academic Procrastination Scale



Third: Reliability

The reliability of the scale was verified using two methods:

a) McDonald's Omega Method:

The reliability coefficients were calculated using McDonald's Omega for each dimension of the Academic Procrastination Scale. The reliability values are presented in Table (3) as follows:

Table (3)
McDonald's Omega Reliability Coefficients for the Dimensions of the Academic Procrastination Scale

Scale Dimensions	McDonald's Omega
Wasting Time Uselessly	0.785
Failure to Meet Deadlines	0.766
Overall Scale	0.776

As shown in Table (3), the reliability coefficients of the Academic Procrastination Scale, both for the overall scale and its sub-dimensions, are relatively high, ranging from 0.766 to 0.785. These values indicate an acceptable level of internal consistency. The overall reliability coefficient for the entire scale is 0.776, which is considered scientifically acceptable and reflects the scale's accuracy as a measurement tool.

b) Split-Half Method:

Split-half reliability coefficients were also calculated for the dimensions of the scale. These values are presented in Table (4).

Table (4):
Split-Half Reliability Coefficients for the Dimensions of the Academic Procrastination Scale

Scale Dimensions	Correlation Between Halves	Corrected Split-Half Reliability
Wasting Time Uselessly	0.733	0.846
Failure to Meet Deadlines	0.718	0.836
Overall Scale	0.726	0.841

As shown in Table (4), the corrected split-half reliability coefficients whether for the total scale or its subscales are relatively high, ranging from 0.836 to 0.846. This indicates that the scale possesses strong internal consistency. The overall corrected split-half reliability for the entire scale is 0.841, which is considered scientifically acceptable.

c) Internal Consistency of the Scale:

To verify the internal consistency of the scale, the researcher calculated **correlation coefficients** between each item and its corresponding subscale, as well as with the total scale score, using data from the pilot sample. These correlations are presented in the following tables.

Table (5)
Correlation Coefficients Between Each Item and Its Corresponding Subscale and the Total Scale Score

Item	Subscale Correlation	Total Scale Correlation	Item	Subscale Correlation	Total Scale Correlation
1	0.735**	0.841**	11	0.712**	0.635**
2	0.716**	0.866**	12	0.825**	0.839**
3	0.541**	0.841**	13	0.823**	0.868**
4	0.768**	0.835**	14	0.756**	0.805**
5	0.730**	0.826**	15	0.749**	0.736**
6	0.742**	0.827**	16	0.625**	0.753**
7	0.685**	0.775**	17	0.689**	0.660**
8	0.752**	0.738**	18	0.859**	0.758**
9	0.698**	0.788**	19	0.647**	0.720**
10	0.587**	0.727**	20	0.802**	0.768**

Note: Correlation is significant at the 0.01 level (2-tailed)

Table (6)
Correlation Between Each Subscale and the Total Scale Score

Subscale	Total Scale Correlation
Wasting Time Uselessly	0.814**
Failure to Meet Deadlines	0.835**

Note: Correlation is significant at the 0.01 level (2-tailed)

As shown in the tables above, all item-to-subscale and item-to-total correlations are statistically significant at the **0.01 level**, which confirms the **internal consistency** of the Academic Procrastination Scale.

2. Mindfulness Scale

The scale is an Arabic adaptation of the original Mindfulness Scale developed by Cardaciotto et al. It was translated and culturally validated by **Radwan** and **Sweid**. The Arabic version of the scale consists of **20 items**, aimed at assessing key aspects of mindfulness, including present-moment awareness, attentional focus, and non-judgmental acceptance of thoughts and emotions. Items are rated on a Likert-type scale that captures the frequency of mindful experiences.

The Arabic version has demonstrated strong psychometric properties and has been widely used in psychological and educational research across Arab populations. Its multidimensional structure captures key aspects of mindfulness relevant to student populations.

Confirmatory Factor Validity:

Using statistical analysis, the adapted scale was evaluated for its factor structure and internal consistency. The results supported the validity of

the instrument in measuring the intended construct within Arabic-speaking university contexts.

A Confirmatory Factor Analysis (CFA) was conducted by the researcher using Mplus Version 7, assuming a **two-factor** structure aligned with the latent dimensions of mindfulness (Acting with Awareness' and 'Acceptance').

Table (7) presents the standardized and unstandardized regression weights of the item loadings on the latent constructs, along with their statistical significance. Table (8) shows the model fit indices for the proposed structure of the Mindfulness Scale and their interpretations. Figure (2) illustrates the proposed factor structure of the scale.

Table (7)
Standardized and Unstandardized Regression Weights of Item Loadings on the Latent Factors of the Mindfulness Scale Derived from Confirmatory Factor Analysis (CFA), and Their Statistical Significance

Factor	Item No.	Standardized Loading	Unstandardized Loading	Standard Error	Critical Ratio	Significance
Acting with Awareness	1	1.000	0.401	0.029	—	—
	3	1.007	0.314	0.172	5.841	0.01
	5	1.261	0.419	0.179	7.028	0.01
	7	1.279	0.493	0.164	7.797	0.01
	9	1.415	0.493	0.184	7.669	0.01
	11	1.139	0.411	0.165	6.903	0.01
	13	1.210	0.421	0.176	6.862	0.01
	15	1.204	0.444	0.168	7.179	0.01
	17	1.221	0.448	0.169	7.232	0.01
	19	1.516	0.609	0.183	8.272	0.01
Acceptance	2	1.000	0.409	0.023	—	—
	4	1.034	0.361	0.161	6.422	0.01
	6	0.321	0.110	0.137	2.350	0.01
	8	1.286	0.551	0.157	8.175	0.01
	10	1.266	0.530	0.158	8.018	0.01
	12	1.067	0.417	0.152	7.023	0.01
	14	0.973	0.377	0.147	6.602	0.01
	16	1.270	0.517	0.162	7.840	0.01
	18	1.567	0.645	0.182	8.602	0.01
	20	1.474	0.580	0.178	8.303	0.01

As shown in Table (7), all items demonstrated statistically significant loadings at the 0.01 level, indicating strong contributions to their respective latent constructs. This supports the construct validity of the

two-factor model of the Mindfulness Scale, which includes “Acting with Awareness” and “Acceptance.”
Table (8) will present the model fit indices for the proposed factor structure of the Mindfulness Scale.

Table (8)
Model Fit Indices for the Proposed Structure of the Mindfulness Scale

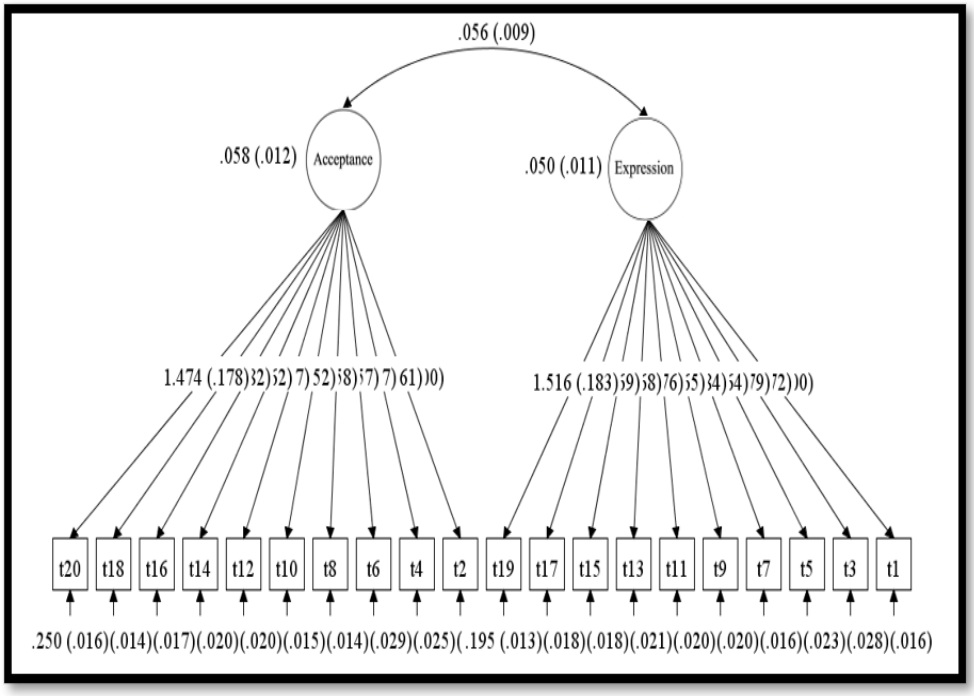
Fit Index	Value	Ideal Range / Interpretation
Chi-Square (CMIN)	250.59	—
Significance Level	0.000	Significant at the 0.01 level
Degrees of Freedom (DF)	190	—
Chi-Square / DF Ratio (CMIN/DF)	1.31	Ideal range: 1 to 3
Goodness of Fit Index (GFI)	0.83	Acceptable if close to 1
Normed Fit Index (NFI)	0.79	Acceptable if close to 1
Incremental Fit Index (IFI)	0.78	Acceptable if close to 1
Expected Cross-Validation Index (ECVI) – proposed	0.81	Lower than saturated model indicates better fit
Expected Cross-Validation Index (ECVI) – saturated	0.83	—
Comparative Fit Index (CFI)	0.784	Acceptable if close to 1
Root Mean Square Error of Approximation (RMSEA)	0.079	Ideal when close to 0 (values < .08 indicate reasonable fit)
Tucker–Lewis Index (TLI)	0.717	Acceptable if approaching 0.90 or higher

As shown in Table (8), the CFA model for the Mindfulness Scale yielded acceptable fit indices, supporting the adequacy of the proposed two-factor structure. The latent constructs identified were:

- Acting with Awareness, and
- Acceptance

These results support the factorial validity of the Arabic adaptation of the Mindfulness Scale. Additionally, Figure (2) presents the visual representation of the proposed factor structure.

Figure (2)
The Proposed Factor Structure of the Mindfulness Scale



3. Reliability

The reliability of the Mindfulness Scale was assessed using two methods:

a. McDonald's Omega

Reliability coefficients were calculated using McDonald's Omega for each dimension of the scale. The results are presented in Table (9):

Table (9)
McDonald's Omega Reliability Coefficients for the Dimensions of the Mindfulness Scale

Scale Dimension	Omega Coefficient
Acting with Awareness	0.762
Acceptance	0.758
Total Scale	0.760

As shown in Table (9), the reliability coefficients for the total scale and its subdimensions were relatively high, ranging from 0.758 to 0.762. The overall Omega value of 0.760 indicates an acceptable level of internal consistency, supporting the scale's reliability as a psychometric tool.

b. Split-Half Method

Split-half reliability coefficients were also calculated for the scale dimensions. The results are displayed in Table (10):

Table (10)
Split-Half Reliability Coefficients for the Dimensions of the Mindfulness Scale

Scale Dimension	Correlation Between Halves	Corrected Split-Half Reliability
Acting with Awareness	0.742	0.852
Acceptance	0.772	0.871
Total Scale	0.757	0.862

As shown in Table (10), the corrected split-half reliability coefficients for both the total scale and its subscales were relatively high, ranging from **0.852 to 0.871**. The overall corrected reliability of **0.862** is scientifically acceptable and supports the internal consistency of the Mindfulness Scale.

c. Internal Consistency

To ensure the internal consistency of the Mindfulness Scale, the researcher calculated **correlation coefficients** between each item and its corresponding subscale score, as well as the total scale score, based on responses from the pilot sample. The results are presented in the following tables.

Table (11)
Correlation Coefficients Between Each Item and Its Subscale Score and the Total Mindfulness Scale Score

Item	Subscale Correlation	Total Scale Correlation	Item	Subscale Correlation	Total Scale Correlation
1	0.635**	0.814**	11	0.815**	0.721**
2	0.749**	0.766**	12	0.795**	0.788**
3	0.763**	0.866**	13	0.759**	0.625**
4	0.640**	0.728**	14	0.665**	0.841**
5	0.748**	0.738**	15	0.866**	0.795**
6	0.845**	0.721**	16	0.827**	0.842**
7	0.735**	0.788**	17	0.877**	0.835**
8	0.759**	0.625**	18	0.838**	0.846**
9	0.645**	0.899**	19	0.852**	0.862**
10	0.816**	0.795**	20	0.812**	0.662**

Note: Correlation is significant at the 0.01 level (2-tailed)

Table (12)
Correlation Between Each Subscale and the Total Scale Score

Subscale	Total Scale Correlation
Acting with Awareness	0.862**
Acceptance	0.845**

As shown in the above tables, all correlations between items and their respective subscales and the total scale were statistically significant at the 0.01 level, indicating strong internal consistency. The results support the reliability and coherence of the Mindfulness Scale for use with Arabic-speaking university students.

3. Self-Efficacy Scale

The Self-Efficacy Scale was adapted from the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) and the current study used the adapted questionnaire by (Abdel-Maqsoud, & Shendi, 2000).

Confirmatory Factor Validity:

Using Mplus Version 7, the researcher performed a Confirmatory Factor Analysis, assuming a single latent factor onto which all items of the Self-Efficacy Scale were loaded.

- Table (13) presents both the standardized and unstandardized regression weights of the item loadings on the latent factor, along with their statistical significance.
- Table (14) provides the model fit indices and their interpretations for the proposed structure.
- Figure (3) illustrates the proposed factor structure of the Self-Efficacy Scale.

Table (13)
Standardized and Unstandardized Regression Weights of Item Loadings on the Latent Factor of the Self-Efficacy Scale Derived from Confirmatory Factor Analysis (CFA), and Their Statistical Significance

Factor	Item No.	Standardized Loading	Unstandardized Loading	Standard Error	Critical Ratio	Significance
Self-Efficacy	1	1.000	0.527	0.022	—	—
	2	1.230	0.539	0.124	9.927	0.01
	3	1.102	0.515	0.116	9.485	0.01
	4	1.252	0.515	0.132	9.459	0.01
	5	1.050	0.435	0.125	8.411	0.01
	6	1.149	0.518	0.121	9.467	0.01
	7	0.659	0.228	0.137	4.799	0.01
	8	1.167	0.438	0.139	8.395	0.01
	9	1.355	0.582	0.132	10.240	0.01
	10	0.694	0.258	0.128	5.417	0.01
	11	1.260	0.581	0.124	10.149	—
	12	1.001	0.434	0.120	8.351	0.01
	13	0.943	0.434	0.113	8.365	0.01
	14	0.976	0.373	0.132	7.403	0.01
	15	1.276	0.563	0.127	10.027	0.01
	16	1.191	0.526	0.125	9.552	0.01
	17	1.045	0.513	0.111	9.451	0.01
	18	0.682	0.253	0.129	5.286	0.01
	19	1.386	0.604	0.132	10.524	0.01
	20	1				

As shown in Table (13), all items on the Self-Efficacy Scale showed statistically significant loadings at the 0.01 level, confirming that each item meaningfully contributes to the underlying latent construct. This supports the construct validity of the single-factor model. The subsequent Table (14) provides model fit indices that evaluate the adequacy of the proposed factor structure.

Table (14)
Model Fit Indices for the Proposed Structure of the Self-Efficacy Scale

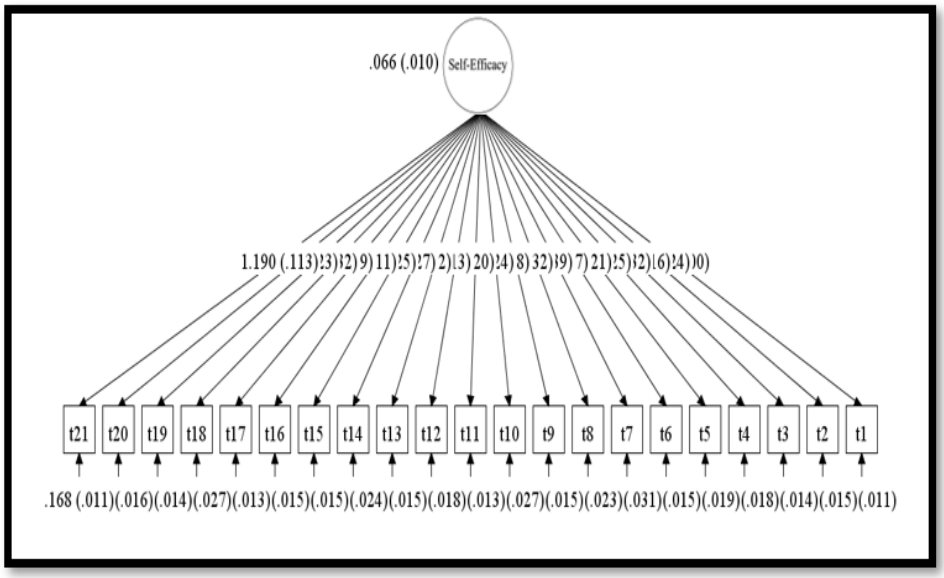
Fit Index	Value	Ideal Range / Interpretation
Chi-Square (CMIN)	678.80	—
Significance Level	0.000	Significant at the 0.01 level
Degrees of Freedom (DF)	289	—
Chi-Square / DF Ratio (CMIN/DF)	2.35	Ideal range: 1 to 3
Goodness of Fit Index (GFI)	0.84	Acceptable if close to 1
Normed Fit Index (NFI)	0.75	Acceptable if close to 1
Incremental Fit Index (IFI)	0.76	Acceptable if close to 1
Expected Cross-Validation Index (ECVI) – Proposed	0.86	Lower than saturated model indicates better fit
Expected Cross-Validation Index (ECVI) – Saturated	0.89	—
Comparative Fit Index (CFI)	0.810	Acceptable if approaching 0.90
Root Mean Square Error of Approximation (RMSEA)	0.068	Acceptable if below 0.08; closer to 0 indicates better fit
Tucker–Lewis Index (TLI)	0.789	Acceptable if approaching or above 0.80

As shown in **Table (14)**, the CFA model for the **Self-Efficacy Scale** demonstrated an acceptable level of model fit, with most indices falling within or near ideal ranges. This supports the unidimensional structure of the scale, indicating that all items collectively reflect a single latent construct of **self-efficacy**. The **factor structure** is also visually represented in **Figure (3)**.

The fit indices of the proposed model indicate an overall acceptable but not optimal fit. The RMSEA (0.068) and CMIN/DF (2.35) suggest that the model fits the data reasonably well. While GFI, CFI, and TLI fall slightly below the conventional thresholds, these values are still within ranges often reported in complex psychological models. The ECVI

results also favor the proposed model over the saturated one, supporting its parsimony. Future validation studies are recommended to further refine the model structure and confirm its cross-sample stability.

Figure (3)
The Proposed Factor Structure of the Self-Efficacy Scale



3. Reliability

The reliability of the **Self-Efficacy Scale** was assessed using two methods:

a. McDonald's Omega

The internal consistency of the scale was evaluated using **McDonald's Omega**. The reliability coefficient for the overall scale is presented in **Table (15)**:

Table (15)
McDonald's Omega Reliability Coefficient for the Self-Efficacy Scale

Scale	Omega Coefficient
Total Scale	0.812

As shown in Table (15), the overall McDonald's Omega coefficient for the Self-Efficacy Scale is **0.812**, which is considered scientifically acceptable and indicates that the scale is a reliable instrument for measuring self-efficacy.

b. Internal Consistency

To verify internal consistency, the researcher calculated **correlation coefficients between each item and the total scale score**, based on responses from the pilot sample. The results are shown in **Table (16)**.

Table (16)

Correlation Coefficients Between Each Item and the Total Scale Score

Item	Correlation with Total Score	Item	Correlation with Total Score
1	0.842**	11	0.837**
2	0.836**	12	0.827**
3	0.866**	13	0.838**
4	0.862**	14	0.862**
5	0.652**	15	0.812**
6	0.842**	16	0.827**
7	0.835**	17	0.827**
8	0.866**	18	0.848**
9	0.862**	19	0.862**
10	0.642**	20	0.812**
		21	0.827**

Note: All correlations are significant at the 0.01 level

As shown in Table (16), all item-total correlations are statistically significant at the 0.01 level, which confirms a strong level of internal consistency within the scale. These results indicate that the items reliably reflect the overall construct of self-efficacy.

Participants were instructed to answer honestly and were reassured that there were no correct or incorrect responses. The average completion time for the survey was 15 to 20 minutes. Standardized instructions were included at the beginning of each section, and survey logic ensured independent responding. After completion, responses were

reviewed for missing data, and any survey with more than 10% of unanswered items was excluded. This resulted in a final valid sample size of 563 students. Participants were then thanked and provided with a short debrief explaining the study's goals and offering practical tips and resources related to time management and effective study strategies.

This approach ensured consistent data quality and participant understanding while preserving the naturalistic setting appropriate for a study on academic behavior.

Statistical Analyses Following confirmation of normality and validity assumptions, the statistical analyses proceeded in several stages. Descriptive statistics and Pearson correlation coefficients were first computed to examine the bivariate relationships among all study variables. As expected, academic procrastination was strongly and negatively correlated with both total mindfulness ($r \approx -0.89$) and self-efficacy ($r \approx -0.89$), indicating substantial inverse associations. A significant positive correlation was also found between mindfulness and self-efficacy ($r \approx +0.85$), suggesting these constructs, while distinct, share underlying components related to general self-regulation.

These high intercorrelations prompted further scrutiny for multicollinearity before proceeding to multivariate modeling. Multiple linear regression analyses were then conducted to test the primary hypotheses. Academic procrastination served as the dependent variable, while mindfulness and self-efficacy were entered as predictors. To address potential multicollinearity among mindfulness indicators, two regression models were run: one using the total mindfulness score and another using only the two theoretically relevant facets. Acting with Awareness and Non-Judging.

Both models employed the standard Enter method to assess the unique contribution of each predictor. Demographic variables (gender and academic level) were included as covariates to examine whether psychological predictors remained significant after controlling these factors. Additionally, interaction effects between mindfulness and self-efficacy were explored using hierarchical regression. Interaction terms were created from mean-centered variables to mitigate multicollinearity, with main effects entered in Step 1 and interaction terms in Step 2.

Effect sizes were reported alongside statistical significance to evaluate the practical impact of predictors. The overall model's explanatory power was quantified using R^2, while Cohen's f^2 was used to assess the local effect size of individual predictors. Interpretations adhered to Cohen's (1988) benchmarks: $f^2 = 0.02$ (small), 0.15 (medium), and 0.35 (large). Where applicable, Cohen's d or partial η^2 was also calculated for group comparisons.

All analyses were conducted using a significance level of $\alpha = .05$ (two-tailed). Confidence intervals were examined to assess the precision of estimates. The inclusion of thorough assumption checks, confirmatory factor analysis, and detailed effect size reporting contributes to the methodological rigor of the study, supporting the robustness of conclusions regarding the predictive roles of mindfulness, self-efficacy, and demographics in academic procrastination.

Study Results:

The research tools were applied to a pilot sample of 100 students from both public and private universities (50 students from public universities and 50 students from private universities). The mean age of the students was 19.66 years, with a standard deviation of 1.82.

Description of the Main Sample

Table (17)

Distribution of Research Sample by Gender (n=563)

Gender	Number	Percentage
Male	45	8.0%
Female	518	92.0%

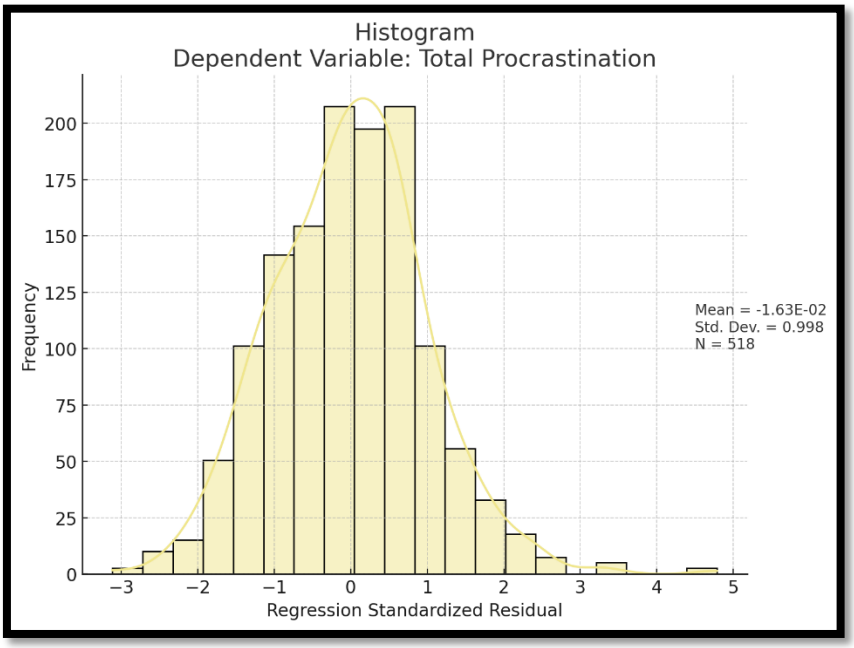
Table (18)

Distribution of Sample Research by University Type (n=563)

University Type	Number	Percentage
Public	372	66.1%
Private	191	33.9%

The mean age of the students in the main sample was 19.82 years, with a standard deviation of 1.65.

Figure (4)
Histogram of Standardized Residuals for Total Procrastination



The First Hypothesis

The first hypothesis states: "**Both mindfulness and self-efficacy contribute to academic procrastination among university students**."

To test this hypothesis, multiple regression analysis using the Enter method was conducted in SPSS. This analysis aimed to predict academic procrastination based on mindfulness and self-efficacy. Tables 18, 19, and 20 present the results of this analysis.

Table (18)
Descriptive Statistics for Study Variables (n = 563)

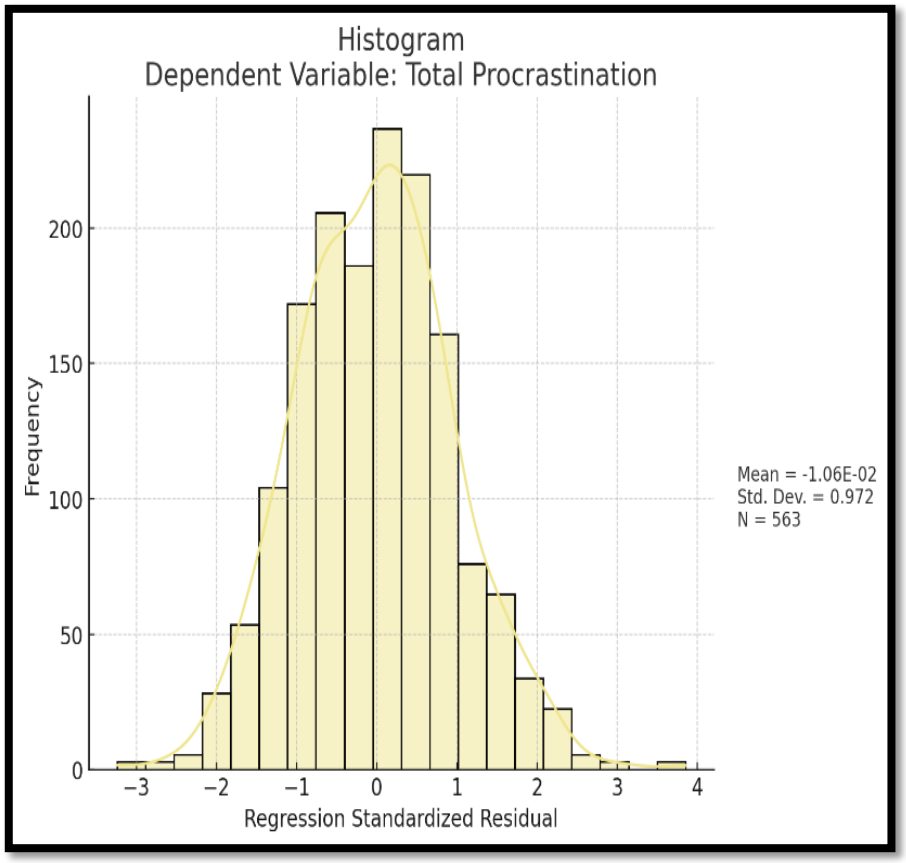
Variable	Mean	Standard Deviation
Academic Procrastination	64.45	5.37
Self-Efficacy Scale	49.75	6.33
Acting with Awareness (Mindfulness Subscale)	23.27	3.44
Non-Judging (Mindfulness Subscale)	24.31	3.57
Mindfulness Scale (Total)	47.58	6.98

Table (19)
Correlation Coefficients Between Mindfulness Dimensions, Overall Mindfulness, Self-Efficacy, and Academic Procrastination

Variable	Academic Procrastination
Self-Efficacy Scale	-0.894
Acting with Awareness (Mindfulness Subscale)	-0.890
Non-Judging (Mindfulness Subscale)	-0.881
Mindfulness Scale (Total)	-0.889

Table 4 demonstrates that the Pearson correlation coefficients between the dependent variable (academic procrastination) and the independent variables (mindfulness and self-efficacy, including their subscales) are significant at the 0.01 level.

Figure (5)
Histogram of Regression Standardized Residuals for Total Procrastination



Regression Analysis

Table (20)
F-value, Coefficient of Determination (R^2), and Significance Levels for Mindfulness Dimensions, Overall Mindfulness, Self-Efficacy, and academic procrastination

Model	Regression Coefficient (β)	t-value	Significance Level (p)
Constant	-55.281	66.190	0.01
Self-Efficacy Scale	2.411	23.177	0.01
Acting with Awareness (Mindfulness Subscale)	2.672	11.429	0.01
Non-Judging (Mindfulness Subscale)	2.361	7.651	0.01
Mindfulness Scale (Total)	1.312	9.506	0.01
F-value	1908.44		
Model Significance (p)	<0.0001		
Coefficient of Determination (R^2)	0.890		

Table 20 reveals that the dimensions of mindfulness (acting with awareness and non-judging), overall mindfulness, and self-efficacy have a significant effect on academic procrastination. The coefficient of determination (R^2), representing the proportion of variance in academic procrastination explained by the independent variables, is 0.890, indicating a substantial effect.

Although the R^2 value of 0.89 indicates a strong model fit, caution is warranted, as this level of explained variance is rare in social science research and may partially reflect shared method variance due to the use of self-report measures.

The prediction model equation can be formulated as follows:

Academic Procrastination = -55.281 + 2.411 * Self-Efficacy + 2.672 * Acting with Awareness + 2.361 * non-judging + 1.312 * Mindfulness (Total)

This regression equation illustrates that each unit increases in self-efficacy and the mindfulness subscales is associated with a measurable decrease in academic procrastination. Notably, the coefficients suggest that "Acting with Awareness" and "Self-Efficacy" are particularly strong predictors. However, the inclusion of both individual mindfulness subscales and the total mindfulness score should be interpreted cautiously due to potential multicollinearity, and future models might benefit from more refined variable selection.

Regression Model for the Male Sample

The second hypothesis states: "**Both mindfulness and self-efficacy contribute to academic procrastination among university students.**" To test this hypothesis within the male sample, multiple regression analysis using the Enter method was conducted in SPSS. This analysis aimed to predict academic procrastination based on mindfulness and self-efficacy among male students. Tables 21, 22, and 23 present the results of this analysis.

Table (21)

Descriptive Statistics for Study Variables (Male Sample, n = 45)

Variable	Mean	Standard Deviation
Academic Procrastination	67.07	6.36
Self-Efficacy Scale	51.04	6.77
Acting with Awareness (Mindfulness Subscale)	24.02	3.66
Non-Judging (Mindfulness Subscale)	25.07	3.92
Mindfulness Scale (Total)	49.09	7.56

Table (22)
Correlation Coefficients Between Mindfulness Dimensions, Overall Mindfulness, Self-Efficacy, and Academic Procrastination (Male Sample)

Variable	Academic Procrastination
Self-Efficacy Scale	-0.896
Acting with Awareness (Mindfulness Subscale)	-0.894
Non-Judging (Mindfulness Subscale)	-0.889
Mindfulness Scale (Total)	-0.894

Note: All correlations are significant at $p < .01$.

Figure (6)
Histogram of Regression Standardized Residuals for Total Procrastination Smaller Subsample

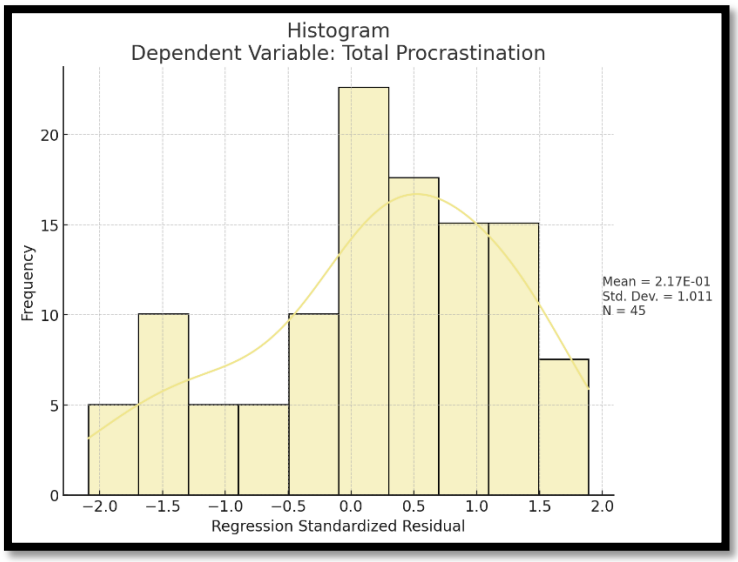


Table (23)
Regression Analysis Results for Academic Procrastination (Male Sample)

Model	Regression Coefficient (β)	t-value	Significance Level (p)
Constant	-52.553	17.135	0.01
Self-Efficacy Scale	1.904	4.870	0.01
Acting with Awareness (Mindfulness Subscale)	0.872	0.956	Not Significant
Non-Judging (Mindfulness Subscale)	0.985	7.360	0.01
Mindfulness Scale (Total)	0.030	5.067	0.01
F-value	197.00		
Model Significance (p)	<0.01		
Coefficient of Determination (R^2)	0.884		

Table 23 demonstrates that self-efficacy, the "non-judging" aspect of mindfulness, and overall mindfulness significantly predict academic procrastination in the male sample. However, the "acting with awareness" aspect of mindfulness was not a significant predictor. The model as a whole is statistically significant ($p < 0.01$), and the coefficient of determination (R^2) indicates that 88.4% of the variance in academic procrastination among male students is explained by the included predictors.

The prediction model equation for the male sample can be formulated as follows:

Academic Procrastination = -52.553 + 1.904 * Self-Efficacy + 0.985 * non-judging + 0.030 * Mindfulness (Total)

This model suggests that self-efficacy, the non-judging facet of mindfulness, and overall mindfulness are significant contributors to reducing academic procrastination among male students. The absence of "acting with awareness" as a significant predictor in this subsample may point to gender-related variations in how mindfulness dimensions

influence procrastination. Although the model explains a high proportion of variance (88.4%), caution is needed when generalizing the findings due to the use of self-report measures and potential multicollinearity, especially between mindfulness subscales and the total score. Future studies should explore these relationships using larger and more balanced samples across gender groups.

Regression Model for the Female Subsample

The third hypothesis states that: "**Both mindfulness and self-efficacy contribute to the prediction of academic procrastination among university students.**"

To test this hypothesis, a **multiple regression analysis** was conducted using the **Enter method** in **SPSS**, with **academic procrastination** as the dependent variable, and **mindfulness (acting with awareness and acceptance)** and **self-efficacy** as predictors. Tables (24), (25), and (26) present the results.

Table (24)

Descriptive Statistics of Study Variables (N = 518)

Variable	Mean	Standard Deviation
Academic Procrastination	64.22	5.27
Self-Efficacy Scale	49.64	6.29
Acting with Awareness	23.20	3.41
Acceptance	24.24	3.53
Total Mindfulness Score	47.44	6.92

Table (25)

Pearson Correlation Coefficients Between Academic Procrastination and the Dimensions of Mindfulness and Self-Efficacy

Predictor Variables	Academic Procrastination
Self-Efficacy Scale	–0.894
Acting with Awareness	–0.890
Acceptance	–0.880
Total Mindfulness Score	–0.888

As shown in **Table (25)**, Pearson correlation coefficients between the dependent variable **academic procrastination** and each of the

independent variables (**mindfulness** and **self-efficacy**, including their subscales) were statistically significant at the **0.01 level**. All correlations were **strong and negative**, indicating that higher levels of mindfulness and self-efficacy are associated with lower levels of academic procrastination among female university students.

Figure (7)

Normal Distribution of Standardized Residuals for Total Procrastination in the Full Sample

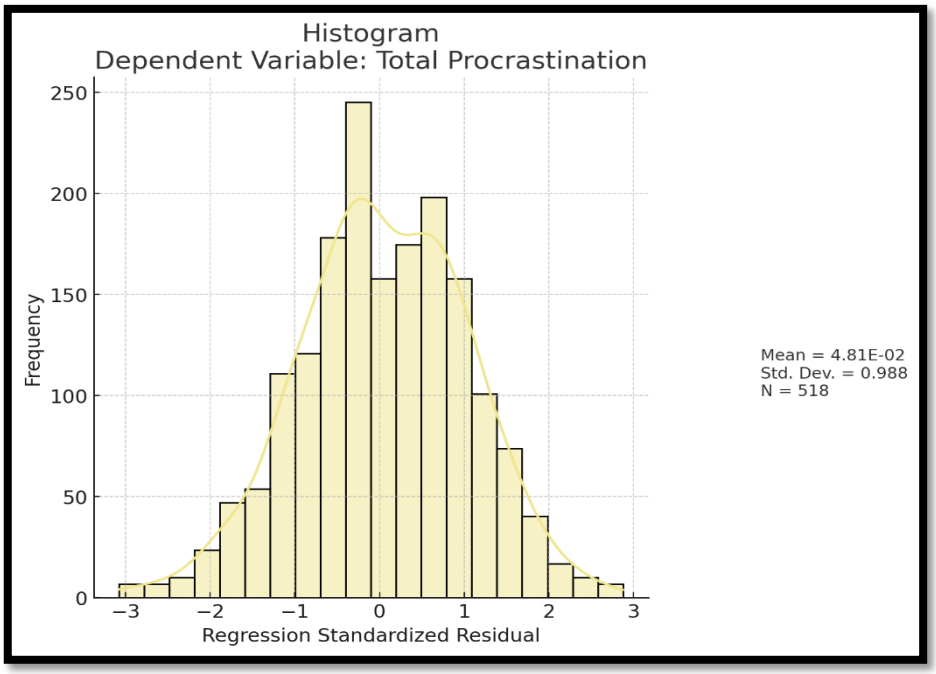


Table (26)
Regression Coefficients, F-value, and R^2 for the Prediction of Academic Procrastination from Self-Efficacy and Mindfulness Dimensions

Predictor	Unstandardized Coefficient (B)	t-value	Significance Level
Constant	–55.489	64.511	0.01
Self-Efficacy	2.455	22.884	0.01
Acting with Awareness	2.830	11.765	0.01
Acceptance	1.651	6.450	0.01
Total Mindfulness Score	1.429	9.942	0.01

F-value: 174.90
Model Significance: 0.01
Coefficient of Determination (R^2): 0.896

As shown in **Table (26)**, all predictor variables, **self-efficacy**, **acting with awareness**, **acceptance**, and the **overall mindfulness score** had statistically significant effects on **academic procrastination** ($p < 0.01$). The **F-value of 174.90** indicates that the regression model is highly significant. The **coefficient of determination ($R^2 = 0.896$)** reveals that approximately **89.6% of the variance** in academic procrastination among female students can be explained by the model, which is a very high explanatory power.

Regression Equation:

The predictive regression equation can be formulated as follows:
Academic Procrastination=−55.489+2.455 (Self-Efficacy) +2.830 (Acting with Awareness) +1.651(Acceptance)+1.429 (Total Mindfulness)

This regression model demonstrates that self-efficacy, acting with awareness, acceptance, and total mindfulness significantly contribute to predicting academic procrastination in female students. The relatively strong regression coefficients for “acting with awareness” and “acceptance” suggest that emotion-focused and attentional regulation

strategies play a particularly important role in how female students manage task avoidance. The high explanatory power ($R^2 = 0.896$) reinforces the strength of these predictors but also raises concerns of potential shared method variance or redundancy across predictors, especially given the conceptual overlap between subscales and the total mindfulness score. Future research should consider using confirmatory factor analysis or structural equation modeling to better isolate the unique contributions of each variable and validate the robustness of this model.

Regression Model for Public University Students

The fourth hypothesis states that: "**Both mindfulness and self-efficacy contribute to the prediction of academic procrastination among university students.**"

To test this hypothesis, a **multiple regression analysis** was conducted using the **Enter method** in **SPSS** to predict **academic procrastination** based on **mindfulness (including acting with awareness and acceptance)** and **self-efficacy**. The results are presented in **Tables (27), (28), and (29)**.

Table (27)
Descriptive Statistics of Study Variables (N = 372)

Variable	Mean	Standard Deviation
Academic Procrastination	58.62	4.93
Self-Efficacy Scale	47.18	6.09
Acting with Awareness	21.85	3.25
Acceptance	22.77	3.37
Total Mindfulness Score	44.62	6.59

Table (28)
Pearson Correlation Coefficients Between Academic Procrastination and the Dimensions of Mindfulness and Self-Efficacy

Predictor Variables	Academic Procrastination
Self-Efficacy Scale	–0.895
Acting with Awareness	–0.891
Acceptance	–0.886
Total Mindfulness Score	–0.892

As shown in **Table (28)**, the **Pearson correlation coefficients** between the dependent variable (**academic procrastination**) and the independent variables (**mindfulness** and **self-efficacy**, including their dimensions) are all **statistically significant at the 0.01 level**. These strong **negative correlations** indicate that higher levels of mindfulness and self-efficacy are associated with **lower levels of academic procrastination** among public university students.

Figure (8)
Histogram of Regression Standardized Residuals for the Model Predicting Academic Procrastination from Mindfulness and Self-Efficacy

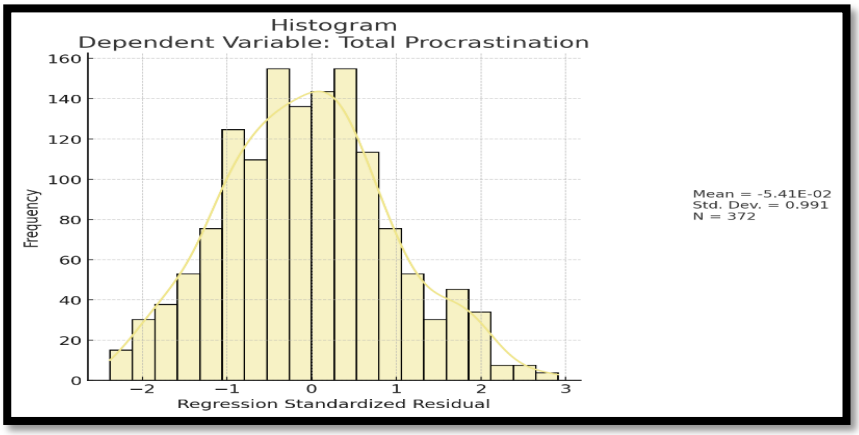


Table (29)
Regression Coefficients, F-value, and R^2 for the Prediction of Academic Procrastination from Self-Efficacy and Mindfulness Dimensions

Predictor	Unstandardized Coefficient (B)	t-value	Significance Level
Constant	–54.350	59.725	0.01
Self-Efficacy	2.080	16.918	0.01
Acting with Awareness	1.807	6.441	0.01
Acceptance	1.782	4.650	0.01
Total Mindfulness Score	0.552	3.094	0.01

F-value: 136.93
Model Significance: 0.01
Coefficient of Determination (R^2): 0.892

As shown in **Table (29)**, the regression model significantly predicts academic procrastination from **self-efficacy** and **mindfulness dimensions** ($p < 0.01$). All predictors had significant effects. The **coefficient of determination ($R^2 = 0.892$)** indicates that approximately **89.2% of the variance** in academic procrastination among public university students is explained by the model demonstrating a very high predictive power.

Regression Equation:

Academic Procrastination=−54.350+2.080(Self-Efficacy)
+1.807(Acting with Awareness)
+1.782(Acceptance)+0.552(Total Mindfulness)

The regression model indicates that self-efficacy and multiple dimensions of mindfulness particularly acting with awareness, acceptance, and the overall mindfulness score are significant predictors of reduced academic procrastination among public university students. The moderate-to-high coefficients for each predictor emphasize the role of both cognitive and emotional self-regulation in this educational context. However, the high R^2 value (0.892) suggests that shared variance or multicollinearity between mindfulness subscales and the total score may be present, potentially inflating model performance. Additionally, given that the sample is restricted to public university students, these results should be generalized cautiously. Future research could benefit from testing the model using more diverse samples and

refining predictor selection through dimensionality reduction techniques or structural modeling.

Regression Model for Private University Students

The fifth hypothesis states that: "**Both mindfulness and self-efficacy contribute to the prediction of academic procrastination among university students.**"

To test this hypothesis, a **multiple regression analysis** was conducted using the **Enter method** in **SPSS**, where **academic procrastination** was the dependent variable and **mindfulness** (including acting with awareness and acceptance) and **self-efficacy** were the independent variables. The results are presented in **Tables (30), (31), and (32)**.

Table (30)

Descriptive Statistics of Study Variables (N = 191)

Variable	Mean	Standard Deviation
Academic Procrastination	75.80	6.20
Self-Efficacy Scale	54.77	2.85
Acting with Awareness	26.04	1.65
Acceptance	27.29	1.41
Total Mindfulness Score	53.33	3.01

Table (31)

Pearson Correlation Coefficients Between Academic Procrastination and the Dimensions of Mindfulness and Self-Efficacy

Predictor Variables	Academic Procrastination
Self-Efficacy Scale	–0.888
Acting with Awareness	–0.873
Acceptance	–0.833
Total Mindfulness Score	–0.869

As shown in **Table (31)**, Pearson correlation coefficients between **academic procrastination** and each of the independent variables **self-efficacy** and **mindfulness dimensions** are all **negative and statistically significant at the 0.01 level**. This indicates that higher levels of self-efficacy and mindfulness are associated with **lower levels of academic procrastination** among private university students.

Figure (9)
Histogram of Standardized Residuals for the Model Predicting Academic Procrastination in the Lowest Mindfulness and Self-Efficacy Subsample

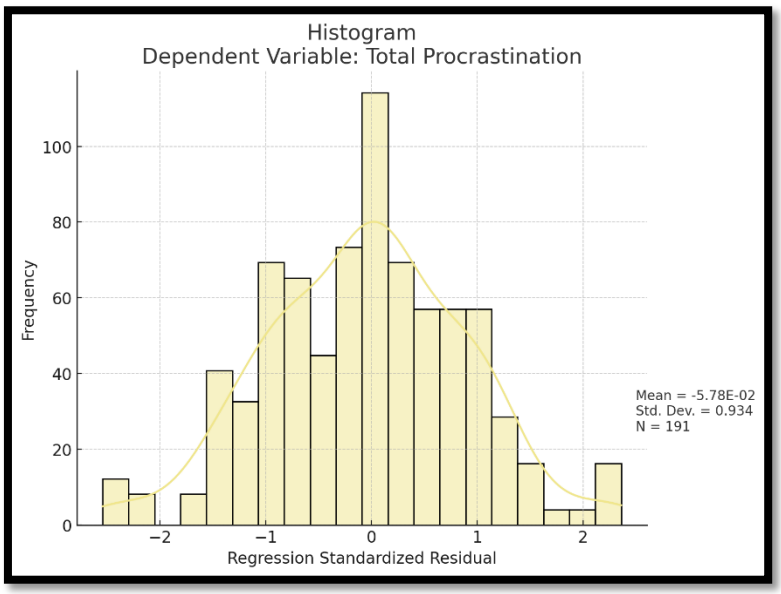


Table (32)
Regression Coefficients, F-value, and R^2 for the Prediction of Academic Procrastination from Self-Efficacy and Mindfulness Dimensions

Predictor	Unstandardized Coefficient (B)	t-value	Significance Level
Constant	–53.185	34.813	0.01
Self-Efficacy	2.444	16.416	0.01
Acting with Awareness	1.747	4.927	0.01
Acceptance	1.820	3.650	0.01
Total Mindfulness Score	1.178	4.837	0.01

F-value: 293.90
Model Significance: 0.01
Coefficient of Determination (R^2): 0.888

As shown in Table (32), the regression model is statistically significant, with all predictor variables (self-efficacy and the mindfulness subscales) contributing meaningfully to the prediction of academic procrastination ($p < 0.01$). The model's coefficient of determination ($R^2 = 0.888$) indicates that approximately 88.8% of the variance in academic procrastination among private university students is explained by self-efficacy and mindfulness. This reflects a very strong predictive relationship.

Regression Equation:

Academic Procrastination=−53.185+2.444 (Self-Efficacy)
+1.747(Acting with Awareness)+1.820(Acceptance)+1.178(Total Min dfulness)

This model reveals that self-efficacy, acting with awareness, acceptance, and overall mindfulness significantly predict academic procrastination among private university students. The regression coefficients suggest a robust role of both emotional awareness and internal confidence in managing procrastination behavior. However, the high R^2 value (0.888) also implies the possibility of multicollinearity between the mindfulness subscales and the total mindfulness score, which may have inflated the explained variance. Moreover, the use of self-reported data and the inclusion of both sub-dimensions and composite mindfulness scores call for further refinement of the model in future research. Employing dimensional reduction techniques or latent variable modeling could help isolate the unique contribution of each construct and validate the stability of these findings across broader contexts.

Study Limitations:

This study has several limitations that should be acknowledged. First, the sample was predominantly female (92%), which may limit the generalizability of the findings across genders, as previous research indicates that males and females may differ in emotional regulation and self-regulatory behaviors associated with procrastination. Second, the use of a convenience sampling method, though practical and commonly applied in exploratory studies may reduce the representativeness of the sample and introduce selection bias. Third, the study's cross-sectional

design restricts the ability to draw causal inferences between mindfulness, self-efficacy, and academic procrastination. Future research would benefit from employing longitudinal or experimental designs to explore these relationships over time. Lastly, while the study offers insights relevant to the Egyptian university context, integrating additional local empirical studies could further strengthen the cultural and educational framing. Research such as Abdel-Khalek & Al-Arja (2020) and El-Sharkawi & Youssef (2022) underscores the role of cultural values and psychological stressors in academic procrastination, which may complement and validate the present findings.

Discussion:

Discussion

The findings of the current study provide compelling evidence for the significant predictive roles of mindfulness and self-efficacy in reducing academic procrastination among university students. These results align with a growing body of international and regional research that positions procrastination as a multidimensional self-regulation failure—rooted in both motivational deficits and ineffective emotion management strategies (Steel, 2007; Sirois & Pychyl, 2013). The notably high negative correlations observed between academic procrastination and both mindfulness and self-efficacy suggest that these psychological constructs are central to understanding and addressing procrastination, particularly within the Egyptian academic context where students face unique socio-educational pressures.

From the perspective of **Social Cognitive Theory** (Bandura, 1986, 1997), self-efficacy is a critical determinant of behavior, shaping students' beliefs about their ability to initiate and complete academic tasks. When students perceive themselves as capable, they are more likely to set goals, manage time effectively, and engage persistently with challenging tasks (Klassen et al., 2008). This study's findings strongly support this view: students with higher self-efficacy scores were significantly less likely to procrastinate, consistent with previous results in both Western (Valenzuela et al., 2020) and Arab contexts (Abdel-Khalek & Al-Arja, 2020), including Egypt. In the Egyptian setting, high academic pressure from family and institutions, coupled with limited autonomy in learning, may make self-efficacy a particularly salient protective factor.

Furthermore, the results reinforce the theoretical assumptions of **Emotion Regulation Theory** (Gross, 1998; 2014), which conceptualizes procrastination as a maladaptive emotional coping strategy. According to this model, students may delay tasks not due to poor planning alone but in an effort to escape anxiety, fear of failure, or task aversion. Mindfulness, particularly the facets of acting with awareness and non-judging, was negatively associated with procrastination, suggesting that students who are more mindful are better equipped to regulate these negative emotional responses. This echoes findings by Sirois & Tosti (2012) and Cheung & Ng (2019), as well as Egyptian evidence showing that students who practice mindful awareness and emotional acceptance report better academic adjustment and lower stress (El-Mougy, 2013). These findings highlight how mindfulness operates as a buffer against the avoidance tendencies commonly linked to emotional discomfort in academic settings.

Integrating these two theoretical frameworks provides a nuanced understanding of procrastination as both a **motivational** and **emotional** deficit. Self-efficacy addresses the *belief that one can succeed*, while mindfulness supports *how one emotionally responds to challenge*. The combined influence of these constructs may be particularly powerful in educational systems like Egypt's, which tend to emphasize exam performance and compliance over autonomy and self-reflection (Megahed & Ginsburg, 2008). In such systems, fostering internal regulatory capacities may be more effective than purely external academic strategies.

The theoretical implications of these findings extend beyond correlation: they invite a rethinking of how educational interventions are structured. Programs that enhance students' confidence in their academic abilities (via mastery experiences and feedback) and cultivate mindful awareness (through attention training and emotional regulation practices) could serve as effective tools to combat procrastination. In Egypt, where psychosocial support structures are often underdeveloped, such integrated psychological approaches may be particularly transformative.

Future research and Implications:

While the current study provides robust correlational evidence for the predictive roles of mindfulness and self-efficacy in academic procrastination, the cross-sectional design limits causal inference. Future research should consider adopting experimental and longitudinal methodologies to validate and extend these findings.

While the regression model accounted for a substantial proportion of variance in academic procrastination ($R^2 = 0.89$), this unusually high value may suggest potential overfitting or shared method variance, particularly due to the use of self-report measures for all constructs. The strong intercorrelations among mindfulness, self-efficacy, and procrastination, although theoretically justified by their shared self-regulatory components, may have contributed to inflated R^2 values. Future studies are encouraged to use mixed methods (e.g., behavioral or observational data) or longitudinal models to verify the stability and generalizability of these findings across time and measurement approaches.

1. Experimental Intervention Studies

To establish causal effects, randomized controlled trials (RCTs) could be implemented to test whether structured interventions targeting mindfulness or self-efficacy reduce academic procrastination. For instance:

- **Mindfulness-based training programs** (e.g., MBSR adapted for students) could be delivered over 6–8 weeks, with pre- and post-intervention assessments.
- **Self-efficacy enhancement workshops** (e.g., mastery experiences, social modeling, verbal persuasion) could be used to increase students' belief in their academic capabilities.
- A **3-group design** (Mindfulness vs. Self-Efficacy vs. Waitlist Control) could determine the relative impact of each intervention on procrastination behaviors.

2. Longitudinal Panel Studies

To trace temporal dynamics and causal ordering among variables, longitudinal panel designs can be employed across a semester or academic year. Repeated measurements of mindfulness, self-efficacy, and academic procrastination at multiple time points (e.g., T1: semester start, T2: midterms, T3: finals) would allow:

- Assessment of **directionality** between variables (e.g., does increased mindfulness precede reductions in procrastination?).
- Use of **cross-lagged panel models** to test reciprocal relationships over time.

3. Ecological Momentary Assessment (EMA)

To enhance ecological validity, future studies could use mobile-based EMA methods to collect real-time data on procrastination episodes, perceived self-efficacy, and mindfulness states across academic tasks. This approach would:

- Reduce recall bias.
- Capture **within-person fluctuations** and context-specific effects.

4. Moderated Mediation Models

Advanced analyses can test whether the **effect of mindfulness on procrastination is mediated by self-efficacy**, and whether this indirect effect varies by **gender**, **academic major**, or **university type**. Integrating such models into longitudinal frameworks would provide more nuanced causal insights.

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The Role of Mindfulness and Self-Efficacy in Predicting Academic Procrastination Among University Students: A Comparative Analysis Across Gender, University Type, and Educational Level

دور اليقظة الذهنية والكفاءة الذاتية العامة في التنبؤ بالإرجاء الأكاديمي لدى طلاب الجامعة: دراسة مقارنة وفقاً للنوع ونوع المؤسسة التعليمية والمستوى الدراسي

الملخص:

هدفت هذه الدراسة إلى فحص مدى إمكانية التنبؤ بالتسويف الأكاديمي الذي يعد مشكلة شائعة بين طلاب الجامعات، لا سيما في السياقات التي تتسم بالضغط الأكاديمي وانخفاض مستوى الاستقلالية. هدفت هذه الدراسة إلى فحص الدور التنبئي لكل من اليقظة الذهنية والكفاءة الذاتية العامة في التسويف الأكاديمي لدى طلاب الجامعات في مصر، بالإضافة إلى استكشاف الفروق بناءً على النوع، ونوع الجامعة، والمستوى التعليمي.

تكونت عينة الدراسة من 563 طالبًا وطالبة من الجامعات المصرية (314 إناث و249 ذكور)، من بينهم طلاب جامعيون وطلاب دراسات عليا، ينتمون إلى جامعات حكومية وخاصة، ومن تخصصات أكاديمية متنوعة، وتتراوح أعمارهم بين 18 و26 عامًا.

تم استخدام ثلاثة مقاييس ذاتية التقدير تم التحقق من صدقها وثباتها وهي: مقياس التسويف الأكاديمي، ومقياس الكفاءة الذاتية العامة، ومقياس اليقظة الذهنية للانتباه والوعي. تم إجراء التحليلات الإحصائية الوصفية، ومعاملات الارتباط لبيرسون، وتحليل الانحدار الخطي المتعدد لاختبار فرضيات الدراسة.

أظهرت النتائج أن كل من اليقظة الذهنية والكفاءة الذاتية كانتا منبئتين سلبياً بشكل دال بالتسويف الأكاديمي؛ حيث ارتبطت المستويات الأعلى منهما بانخفاض مستويات التسويف. كما ظهرت فروق دالة بين الذكور والإناث، حيث أبلغ الذكور عن مستويات أعلى من التسويف، بينما لم تظهر فروق دالة إحصائيًا بناءً على نوع الجامعة أو المستوى التعليمي.

تؤكد هذه النتائج على أهمية تعزيز اليقظة الذهنية والكفاءة الذاتية العامة كسمات نفسية وقائية في استراتيجيات التدخل الرامية إلى تقليل التسويف الأكاديمي بين طلاب الجامعات في مصر.

الكلمات المفتاحية :طلاب الجامعة، التسويف الأكاديمي، الكفاءة الذاتية العامة، اليقظة الذهنية.