Investigating the Relationship Between Cognitive Flexibility, Procrastination and Academic Performance among College Students

Dissertation submitted in partial fulfilment of the requirements for the award of

Master of Science in Psychology

By

Aleena Rose Register No:

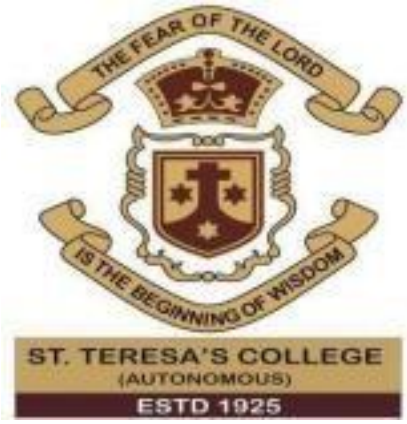
SM23PSY002

Under the guidance of

Ms. Maria Dony

Assistant Professor

Department of Psychology



ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM Nationally Re-accredited at 'A++' level (4th cycle)

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CERTIFICATE

This is to certify that the dissertation entitled, "Investigating The Relationship Between Cognitive Flexibility, Procrastination and Academic Performance among College Students", is a bonafide record submitted by ALEENA ROSE SM23PSY002 of St.Teresa's College, Ernakulam under the supervision and guidance of Ms. Maria Dony and that it has not been submitted to any other university or institution for the award of any degree or diploma, fellowship, title or recognition before.

Date:

ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM * DEPARTMENT OF PSYCHOLOGY *

Ms Ann Joseph

Head of the Department

Department of Psychology

ST. Teresa's College Ernakulam

Ms Maria Dony

Assistant Professor

Department of Psychology

St. Teresa's College, Ernakulam

External Examiner 1: Ms. Pavana Sivakumar

External Examiner 2: .....

Internal Examiner: .....

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Date:

Ms Ann Joseph
Head of the Department
Department of Psychology
ST. Teresa’s College Ernakulam

Ms Maria Dony
Assistant Professor
Department of Psychology
St. Teresa’s College, Ernakulam

External Examiner 1: …… External

Examiner 2: ……..

Internal Examiner: …….

DECLARATION

I, Aleena Rose, do hereby declare that the work represented in the dissertation embodies the results of the original research work done by me in St. Teresa's College, Ernakulam, under the supervision and guidance of Ms. Maria Dony, Assistant Professor, Department of Psychology, St. Teresa's College, Ernakulam. It has not beem submitted by me to any other university or institution for the award of any degree, diploma, fellowship, title, or recognition before.

Place : Ernakulam Aleena Rose

Date :

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Thanking you

Aleena Rose

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Abstract

This study examines the relationships between cognitive flexibility, procrastination, and academic performance among college students. The findings reveal a significant negative correlation between cognitive flexibility and procrastination, indicating that students with greater adaptability are less likely to procrastinate. However, no significant relationship was found between cognitive flexibility and academic performance, suggesting that cognitive adaptability alone does not directly impact academic success. Additionally, a significant negative correlation was observed between procrastination and academic performance, reinforcing the detrimental effects of procrastination on student achievement. These results highlight the importance of addressing procrastination in academic settings through targeted interventions, such as time management training and self-regulation strategies. While cognitive flexibility may aid in managing academic challenges, other factors like motivation and study habits play a crucial role in academic performance.

Chapter I

Introduction

Background

Figuring out what impacts how well students do in school is super important for tackling the challenges they run into while chasing their educational dreams. One big player in this mix is cognitive flexibility, which is basically how well someone can adapt to new info and changing demands. It really makes a difference in learning and solving problems. Even though cognitive flexibility often goes hand-in-hand with better school adjustment, we're not entirely sure how it directly affects academic performance. Plus, procrastination is something many students struggle with, leading to messy time management, more stress, and not-so-great grades. Since procrastination usually ties back to issues with self-regulation, it might be that cognitive flexibility can help students juggle their schoolwork a bit better and kick procrastination to the curb. So, by digging into how cognitive flexibility, procrastination, and academic performance are related, this study aims to clarify how these factors play off each other and if being cognitively adaptable helps buffer against procrastination's negative effects on student success. Getting a handle on these connections can lead to better academic support strategies that boost self-regulation, time management, and learning approaches.

Academic performance refers to the extent to which a student has achieved their educational goals, commonly measured through grades, test scores, and overall academic accomplishments (Busalim et al., 2019). Cognitive flexibility, defined as the mental ability to adapt to changing situations, tasks, or demands, has emerged as a critical factor in understanding procrastination and academic performance (Wixted et al., 2016). Academic performance refers to the extent to which a student has achieved their educational goals, commonly measured through grades, test scores, and overall academic accomplishments (Busalim et al., 2019). It encompasses

the completion of educational benchmarks such as secondary school diplomas and bachelor's degrees. Additionally, academic performance serves as an indicator of a student's mastery of subject matter, their ability to apply knowledge, and their level of engagement and effort in their studies (Anthonysamy et al., 2020. Academic performance refers to the degree to which students achieve their educational goals, as measured through assessments such as grades, standardized tests, and instructor evaluations (APA, n.d.). It is influenced by cognitive abilities, motivation, learning strategies, and environmental factors (Wigfield & Eccles, 2000). Academic performance is often linked to self-efficacy, which refers to students' beliefs in their ability to succeed in academic tasks (Bandura, 1997). High self-efficacy is associated with greater persistence, higher motivation, and improved academic achievement (Schunk & Pajares, 2002). Furthermore, personality traits, particularly conscientiousness, have been identified as strong predictors of academic success, as students who exhibit high levels of organization, discipline, and goaldirected behavior tend to perform better (Costa & McCrae, 1992). The ecological context also plays a critical role in shaping academic performance, as students' learning environments—including family support, peer interactions, and institutional resources—can significantly impact educational outcomes (Bronfenbrenner, 1979). Understanding academic performance requires a holistic approach that considers both individual and external factors contributing to learning success.

Cognitive flexibility is the ability to shift one's cognitive approach in response to changing environmental demands, allowing individuals to modify their strategies and behavior to adapt to new and unexpected situations (Cañas et al., 2003). This concept is central to problemsolving, decision-making, and learning (Diamond, 2013). It is often conceptualized as comprising two main components: task-switching, which involves shifting between cognitive

tasks, and set-shifting, which requires the ability to switch between different mental frameworks or strategies (Miyake & Friedman, 2012). Cognitive flexibility is closely associated with executive functions and is mediated by neural circuits involving the prefrontal cortex, specifically the dorsolateral and medial prefrontal regions, as well as the basal ganglia and their corticostriatal connections (Cools et al., 2004). Research has demonstrated that deficits in cognitive flexibility are linked to various neuropsychological disorders, including autism spectrum disorder, obsessive-compulsive disorder, and attention-deficit hyperactivity disorder (Schmitz et al., 2003). These findings suggest that cognitive flexibility is a fundamental cognitive mechanism that underpins adaptive behavior and learning across different contexts.

Procrastination is defined as the act of delaying or postponing tasks despite knowing that such delays will likely result in negative outcomes (Steel, 2007). It is considered a self-regulation failure that leads to suboptimal performance in academic, occupational, and personal domains (Pychyl & Flett, 2012). Procrastination is often categorized into two types: passive and active. Passive procrastinators delay tasks due to indecisiveness and self-doubt, whereas active procrastinators deliberately postpone tasks, believing that they work better under pressure (Chu & Choi, 2005). Various cognitive, emotional, and motivational factors contribute to procrastination, including fear of failure, perfectionism, impulsivity, and low self-efficacy (Ferrari, 2001). Neurobiological research indicates that procrastination is linked to an imbalance between the limbic system, which drives immediate gratification, and the prefrontal cortex, which is responsible for long-term planning and self-control (Ferrari & Pychyl, 2012). Moreover, hyperbolic discounting, a concept from behavioral economics, explains procrastination as a preference for smaller, immediate rewards over larger, delayed rewards, leading to timeinconsistent decision-making (Ainslie, 1975; Loewenstein & Prelec, 1992). Understanding

procrastination from a multidimensional perspective is crucial for developing effective interventions to improve self-regulation and task engagement.

Theoretical framework

Understanding how cognitive flexibility, procrastination, and academic performance all connect isn't as complicated as it sounds. Basically, cognitive flexibility is about being able to change your thinking and adapt to new tasks, which is an important part of how we manage our minds (thanks to researchers like Miyake & Friedman, 2012). When someone struggles with cognitive flexibility, it can mess with their self-control, making procrastination more likely, and that usually doesn't end well for grades (Diamond, 2013). On a brain level, procrastination is linked to issues in the prefrontal cortex and how it interacts with the limbic system – this means we often prefer quick rewards instead of working toward longer-term academic goals (Ferrari & Pychyl, 2012). There are also motivational theories that help explain this situation. For example, the Temporal Motivation Theory (Steel & König, 2006) suggests procrastination happens when we put off long-term success for short-term rewards. Similarly, the Expectancy-Value Theory (Wigfield & Eccles, 2000) says that if students don't think they can succeed or don't value the task, they're more likely to procrastinate.

On the flip side, the Self-Effectiveness Theory (Bandura, 1997) tells us that students who believe they can do well are less likely to delay their work. The Self-Regulation Theory (Baumeister & Heatherton, 1996) tells us that procrastination is basically a slip in self-control, where we struggle to align our actions with the bigger picture. And from a cognitive-behavioral view, having unrealistic beliefs and fear of failure can also contribute to procrastination (Ellis & Ferrari, 2007). Freud even suggested that procrastination arises from unconscious conflicts

(Freud, 1923). Looking from the Behavioral Economics angle (Ainslie, 1975), where procrastination is seen as a choice to give up future rewards for immediate pleasure. According to the Big Five Personality Traits framework (Costa & McCrae, 1992), being conscientious can help predict levels of procrastination and academic performance. The Goal Orientation Theory (Dweck & Leggett, 1988) differentiates between students who are focused on learning and those who might procrastinate out of fear of failure.

Meanwhile, the Self-Determination Theory (Deci & Ryan, 2000) shows that being intrinsically motivated can help reduce procrastination and boost academic performance.The impact of our environment, which Bronfenbrenner's Ecological Systems Theory (1979) emphasizes that supportive family, friends, and schools can really help reduce procrastination by encouraging resilience and good study habits. Plus, Attribution Theory (Weiner, 1985) explains how how students think about their wins and losses can affect their motivation and performance. And the Theory of Multiple Intelligences (Gardner, 1983) says that our unique smarts can shape how we learn and succeed in school. Bringing all these ideas together gives us a clearer picture of how cognitive flexibility affects procrastination and, in the end, how students perform academically. It shows that focusing on ways to improve thinking skills, motivation, and selfcontrol can really make a difference in students' academic journeys.

Chapter II Review of literature

This literature review takes a look at how cognitive flexibility, procrastination, and academic performance are all linked. It shows how being adaptable in your thinking can help

students juggle their tasks and deal with stress better. Some key points include how cognitive flexibility contributes to resilience in school, boosts confidence, and influences learning strategies, not to mention how it ties into procrastination and managing time. Plus, it dives into how things like social support, sticking with tasks, and beliefs about intelligence can play a role in academic success. Finally, the review touches on why cognitive flexibility is important in today's educational settings, especially with online learning and programs aimed at helping students do better.

Cognitive flexibility

Senyigit and Kiran (2019) examined the relationship between cognitive flexibility and problematic internet use among 1,642 high school students in Adana, Turkey. Using the "Cognitive Flexibility Scale" and "Problematic Internet Use – Adolescence" measures, the study adopted a correlational survey model to analyze the data. Results showed that higher cognitive flexibility was associated with lower problematic internet use, fewer negative internet outcomes, and reduced excessive internet use. While gender did not influence problematic internet use, males reported higher social benefit-social comfort, and females showed higher excessive internet use. The authors recommended group interventions to reduce problematic internet use and psychoeducational programs to enhance cognitive flexibility.

Meanwhile, Ferdowsi, Sepah, and Ghanbary Panah (2022) explored the relationship between intelligence beliefs, cognitive flexibility, and academic performance, focusing on the mediating roles of perceived social support and self-perception. The study used a descriptivecorrelation method with structural equation modeling, involving a sample of 450 students selected through multi-stage cluster random sampling. The research instruments

included the Academic Performance Questionnaire (Dortaj, 2004), the Intellectual Trait Inventory Scale
(ITIS), Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010), and the Multidimensional Scale of Perceived Social Support (MSPSS). The findings indicated that perceived social support did not mediate the relationship between intelligence beliefs and academic performance. However, cognitive flexibility had an indirect and significant effect on academic performance through perceived social support, while self-perception did not mediate the relationship between cognitive flexibility and academic performance. The study concludes that cognitive flexibility directly and indirectly influences academic performance through perceived social support in ninth-grade students.

Additionally, Pourmousavi, Azargon, and Mansouri (2024) investigated the impact of life skills training on cognitive flexibility and social well-being among students dependent on cyberspace in Neyshabur, Iran. The study used a semi-experimental design with pretest, posttest, and follow-up assessments, involving an experimental group of 30 students selected through convenience sampling. The researchers utilized the Internet Addiction Questionnaire (Young, 1998), Cognitive Flexibility Scale (Martin & Rubin, 1995), and Social Well-Being Questionnaire (Keyes, 1998) to collect data, while the life skills training program was adapted from Zare et al. (2019) and consisted of eight 90-minute sessions.Repeated measures analysis of variance revealed that the life skills program significantly improved cognitive flexibility and social wellbeing among students. The results suggest that life skills training enhances cognitive, emotional, and social abilities, helping students adapt and improve their overall well-being and cognitive flexibility.

Cognitive flexibility and academic performance

Moreover, Alammar, Ram, Albarragi, and Alshahrani (2022) investigated the relationship between cognitive flexibility, resilience, and academic achievement among 303 college students during the COVID-19 pandemic. Using the Cognitive Flexibility Scale and the Cognitive Resilience Scale, the study applied descriptive statistics, contingency table analysis, Kruskal–Wallis H test, Mann–Whitney U test, and regression analysis. Results revealed that cognitive flexibility was higher in success-oriented health science students, while resilience was greater in students with lower course competency or psychological issues. Academic performance was positively linked to economic status but negatively linked to perceived course competency, with cognitive resilience predicting exam performance, moderated by cognitive flexibility. The study emphasized the importance of interventions to enhance cognitive resilience and flexibility for improving academic outcomes.

However, Mollaei, Hejazi, Yosefi Afrashteh, and Morovvati (2020) explored the mediating role of cognitive flexibility in the relationship between academic optimism and academic vitality among 400 high school girls in Zanjan, Iran. Using Dehghanizadeh and Husainichary's Academic Vitality Questionnaire, Tschannen-Moran's Academic Optimism Questionnaire, and Dennis and Vander Wal's Cognitive Flexibility Questionnaire, the study adopted a descriptive correlational method with data analyzed through structural equation modeling.Results showed that academic optimism had an indirect positive relationship with academic vitality, mediated by cognitive flexibility ($p<0.01$). The findings also indicated significant positive relationships between academic optimism and cognitive flexibility, as well as between cognitive flexibility and academic vitality ($p<0.05$). This study emphasized the

importance of academic optimism in fostering cognitive flexibility, which in turn enhances academic vitality.

On the other hand, Sousa et al. (2024) examined the impact of cognitive flexibility and task persistence on academic performance in children from different backgrounds, comparing 46 children in care with 48 children from a community sample, aged 6 to 10 years. The study used the Raven's Colored Progressive Matrices (RCPM-B), the Portuguese version of the School-Age Temperament Inventory (SATI), and the competence academic scale (CAS) of the Social Skills Rating System (SSRS-T) to assess cognitive flexibility, temperament, and academic performance, respectively. The findings showed that cognitive flexibility significantly predicted academic performance for children in care, while task persistence mediated the relationship between cognitive flexibility and academic performance in both groups. A between-group difference was observed, as children in care exhibited a direct effect of cognitive flexibility on academic performance in addition to the mediation effect. The study highlights the importance of fostering cognitive and task persistence skills in both normative and at-risk populations to improve academic outcomes.

Cognitive flexibility and Procrastination.

Besides that, Schommer-Aikins and Easter (2018) explored the relationships between cognitive flexibility, procrastination, and the need for closure in online self-directed learning among over 200 college students. The study used measures such as the Khiat (2015) instrument for online self-directed learning, a 12-item cognitive flexibility instrument (Martin & Rubin, 1995), a 7-item procrastination scale (Tuckman, 1991), and a 15-item need for closure scale (Roets & Hiel, 2011). Regression analyses revealed that students with higher cognitive flexibility scores were better at exploring online resources, engaging with peers and instructors, and

monitoring their learning success. Conversely, students with higher procrastination scores struggled with time management in online courses, while those with a strong need for closure faced difficulties managing stress. The findings highlight the critical roles of cognitive flexibility and procrastination in shaping academic performance in self-directed online learning environments.

Procrastination and Academic Performance

Specifically, Lakshminarayan, Potdar, and Reddy (2012) investigated the relationship between procrastination and academic performance among 209 undergraduate dental students in India. Using a 16-item questionnaire to measure procrastination levels, along with academic performance data, the study analyzed the results using Spearman's correlation coefficient and the Mann-Whitney U test. Findings revealed a significant negative correlation ($r = -0.63$, $p < 0.01$) between procrastination and academic performance, indicating that students with higher procrastination scores performed below average academically. , gender differences in procrastination scores were significant ($p < 0.05$). The study concluded that students with lower procrastination levels tended to achieve above-average academic performance.

Although, Jackson (2024) examined the roles of academic procrastination, self-efficacy beliefs, and prior academic skills on course outcomes among 123 college students enrolled in a developmental English course. The study found that despite high academic self-efficacy beliefs, students in developmental education did not achieve higher grades, suggesting an overestimation of their academic abilities. The Procrastination Assessment Scale-Students (PASS; Solomon & Rothblum, 1984) and the Academic Self-Efficacy Scale (ASES; Elias & Loomis, 2000) were used, along with the COMPASS Writing Skills Placement Test to measure prior academic skills.

Results revealed a significant negative relationship between academic procrastination and academic self-efficacy, with students exhibiting high procrastination also showing lower selfefficacy and poorer academic performance. The study also highlighted that task aversiveness was the primary reason for procrastination, particularly among younger students and men, and found that prior academic skills were a strong predictor of academic achievement.

Besides that, Balkis (2013) examined the mediator role of rational beliefs about studying in the relationships among academic procrastination, academic life satisfaction, and academic achievement in a sample of 290 undergraduate students. Academic procrastination was assessed using the Aitken Procrastination Inventory (Aitken, 1982), rational beliefs about studying were measured with the work habit subscale of the Academic Rational Beliefs Scale (Egan et al., 2007), academic life satisfaction was evaluated with the Academic Satisfaction Scale (Schmitt et al., 2008), and academic achievement was represented by GPA.Structural Equation Modeling (SEM) analyses revealed that academic procrastination was negatively related to rational beliefs, life satisfaction, and academic achievement, while rational beliefs were positively related to academic life satisfaction and achievement. Rational beliefs mediated the effects of academic procrastination on both academic life satisfaction and achievement, and life satisfaction further mediated the relationships between procrastination, rational beliefs, and achievement. These findings underscore the importance of fostering rational beliefs to improve both academic satisfaction and performance

Not only that, Joseph (2016) conducted a correlational study to examine the relationships between academic procrastination, academic self-efficacy, and academic performance among 265 students at Chinese General Hospital Colleges. The study used the Procrastination

Assessment Scale for Students (PASS) (Solomon & Rothblum, 1984), the Academic SelfEfficacy Scale (Chemers, Hu & Garcia, 1991), and students' general weighted average (GWA) for academic performance. Results showed significant relationships between academic procrastination and academic self-efficacy, as well as between academic self-efficacy and academic performance, but no significant relationship between academic procrastination and academic performance.The findings highlight the role of academic self-efficacy in reducing procrastination and improving academic outcomes. The study concluded that fostering academic self-efficacy is key to enhancing student performance.

Cognitive flexibility, Procrastination and Academic Performance

Furthermore, Zayed (2024) explored the relationships between academic self-efficacy, academic competitiveness, academic procrastination, and cognitive flexibility among 450 undergraduate students at a university in Egypt, comprising 300 fourth-year and 150 first-year students. The study used several scales, including the Academic Self-Efficacy Questionnaire (Sachitra & Bandara, 2017), Academic Hypercompetitiveness Scale (Bing, 1999), Brief Inventory of Academic Procrastination (Geara et al., 2019), and the Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010). Descriptive statistics were performed using SPSS to analyze the data, revealing positive relationships between academic self-efficacy, academic competitiveness, and cognitive flexibility, and a negative relationship with academic procrastination. Gender differences were found, with females showing higher academic selfefficacy and males exhibiting higher academic procrastination, but no differences were found in academic competitiveness and cognitive flexibility. The study also found that fourth-year students exhibited higher academic self-efficacy, lower academic procrastination, and better

cognitive flexibility than first-year students, with no differences in academic competitiveness across study levels.

Rationale

As educational pressures keep climbing, students are feeling the heat to keep their grades up. This often leads to more procrastination, which can seriously hurt their academic performance. Understanding how cognitive flexibility could help tackle procrastination is super important for helping students juggle their workloads better (Sari & Kantar, 2023; Khasawneh et al., 2023). With the shift to online and hybrid learning because of the COVID-19 pandemic, the way students engage and learn has changed quite a bit. Cognitive flexibility is key to adapting to these new learning setups and managing the distractions that come with remote education. Research in this area can really help shape teaching strategies that boost students' adaptability and performance (Feng et al., 2020; Sugiura, 2023). Mental health issues like anxiety and depression are becoming more common among students, and they often lead to procrastination and poor academic results. Studies on cognitive flexibility could reveal strategies that help students handle stress and build their academic resilience (Zayed et al., 2024; Aydin et al., 2022). By exploring cognitive flexibility alongside procrastination and academic performance, we could create well-rounded programs that promote flexible learning environments, eventually helping students thrive (Bakar et al., 2021; Kim et al., 2022). In a world that's changing faster than ever, developing skills like cognitive flexibility is essential for ongoing learning and adaptability. By digging into these factors in the educational context, researchers can help develop curricula that truly prepare students for future challenges in school and their careers (Mojgan et al., 2023; Sousa et al., 2023).

Current study

This study looks into how cognitive flexibility, procrastination, and academic performance are all connected—pretty key stuff that really impacts how students do in school. We all know that doing well academically is super important for personal and professional growth, but a lot of students find themselves stuck because they procrastinate. By getting a better grip on the mental processes behind procrastination, especially how cognitive flexibility plays a role, we can start to understand why some students tackle school challenges better than others. Even though these issues are important, there's a bit of a hole in research that digs deep into how they all interact. A lot of what's out there tends to focus on specific groups of students, which makes it hard to draw broader conclusions. Plus, many studies zoom in on internal factors and overlook outside influences like socio-economic status and access to school resources. Since academic success comes from a mix of mental, behavioral, and environmental factors, we really need a wider-angle lens to fully grasp what shapes student performance. By filling in these gaps, this study adds to the ongoing conversation about executive function, self-regulation, and learning strategies. The findings should be useful for teachers, counselors, and policymakers because they emphasize ways to boost cognitive flexibility, cut down on procrastination, and improve academic outcomes. And considering how procrastination ties into stress and anxiety, this research could also help with creating mental health strategies that keep students feeling good. All in all, this study offers both theoretical insights and practical advice, giving real-world, research-backed suggestions to help students shine academically while taking a variety of influencing factors into account.

Chapter III

Methodology

Problem statement

The study investigates how cognitive flexibility and procrastination can influence the academic performance of students.

Objectives

- To asses whether there is a relationship between cognitive flexibility and procrastination
- To asses whether there is a relationship between cognitive flexibility and academic performance
- To asses whether there is a relationship between procrastination and academic performance

Hypothesis

$H0_1$ - There is no significant relationship between cognitive flexibility and procrastination

$H0_2$ -There is no significant relationship between cognitive flexibility and academic performance

$H0_3$ -There is no a significant relationship between procrastination and academic performance

Operational definition

1. Cognitive flexibility : Cognitive Flexibility is the dynamic, domain-general ability that develops overtime under the impact of learning and experience. (Dennis & Vander Wal 2010)
2. Procrastination : Procrastination, generally out, is the practice of carrying out less urgent tasks in preference to more urgent ones, or doing more pleasurable things in place of less

pleasurable ones and thus putting off impending tasks to a later time. In order for behaviour to be classified as procrastination: It must be counter productive, needless and delaying. Similarly, it is to voluntarily delay an intended course of action despite expecting to be worse off for the delay.(Lodha 2016)

3. Academic performance : the demonstration of knowledge, skills, and competencies acquired in an educational setting, typically measured through assessments such as grades, standardized tests, and academic achievements. (York, Gibson, and Rankin 2015).

Research design

The study uses a quantitative approach to investigate the relationship between Cognitive Flexibility, Procrastination and Academic Performance. A correlational design was used to examine the extent to which academic performance associates with Cognitive Flexibility and Procrastination.

Sampling

The study utilized a sample size of 249 participants, selected through a convenience sampling method, to investigate the relationships between cognitive flexibility, procrastination, and academic performance. Sociodemographic details, particularly focusing the multilingual background of the participants, was collected to provide context and enhance the analysis of the data. This data collection will be facilitated using Google Forms, allowing for efficient and organized gathering of responses.

Inclusion Criteria

- Participants who are currently in a university or college program. This helps us make sure they've got some relevant experiences when it comes to cognitive flexibility, procrastination, and performance.

- Participants should be between the ages of 18 and 30. This range usually includes most college students and focus more on young adults.
- Participants should be exposed to more than one language, whether that's from growing up in a bilingual environment or through their education.

Exclusion Criteria

- Participants not currently enrolled in a college or university, won't be able to take part.
- Participants who are not able to understand English would be excluded
- Participants who have seeked or is seeking therapy would be excluded

Measures

Socio-demographic Sheet

Participants shared their name, age, and gender, plus what they studied in school. Particpants are asked to share socioeconomic status, focusing on things like income and job type. Where they live whether it's in a city or out in the countryside was noted as well since that can really affect access to educational resources and opportunities. details about their parents' education levels were recorded since that can have a big impact on how students behave academically and what they aim for. Participants were asked if they spoke multiple languages,

as being around different languages can boost cognitive flexibility and improve academic performance. Finally academic performance was asses by asking the participants to enter their previous semester marks.

Academic Performance

The academic performance was assessed by asking the particpants to provide the previous semester percentage in the sociodemographic sheet.

Cognitive Flexibility Inventory (CFI) (Dennis & Vander Wal, 2010)

The Cognitive Flexibility Inventory (CFI) is a 20-item self-report measure to monitor how often individuals engaged in cognitive behavioural thought challenging interventions (Dennis & Vander Wal, 2010). Cognitive flexibility enables individuals to think adaptively when encountering stressful life events, and is a core skill that helps individuals avoid becoming stuck in maladaptive patterns of thinking. Scores consist of a total CFI score and two subscale scores. The total score ranges between 20 and 140, where higher scores indicate more cognitive flexibility. Each item is rated on 7- point likert scale of strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree, strongly agree)

The two subscales measuring important aspects of cognitive flexibility are: Alternatives: measuring the ability to perceive multiple alternative explanations for life occurrences and human behaviour and the ability to generate multiple alternative solutions to difficult situations. Control: measuring the tendency to perceive difficult situations as controllable.

The 20-item CFI showed high test-retest reliability for the full score (r = .81), Alternatives subscale (r = .75), and Control subscale (r = .77; Dennis & Vander Wal, 2010). Cronbach's alpha ranged from good to excellent, for the Alternatives subscale (alpha = .91), Control subscale (alpha = .86), and the full score (alpha = .90; Dennis & Vander Wal, 2010). Furthermore, evidence was obtained for the convergent construct validity of the CFI and its two subscales via their associations with other measures of cognitive flexibility, depressive symptomatology, and coping (Dennis & Vander Wal, 2010).

General Procrastination Scale (GPS) (Lodha et. 2016)

The General Procrastination Scale was developed by Lodha et. (2016). With 23 items in total. All items are required to be rated on a 5-point Likert scale (never, rarely, sometimes, often, always). The scores reveal a Procrastination Quotient (PQ). The Split Half Reliability was calculated equivalent to 0.711, which was similarly close to the value of Cronabch's Alpha correlation value, established at 0.714. The General Procrastination Scale was observed to be high on Construct validity 0.76.

Table 1

Reliability of cognitive flexibility scale and general procrastination scale

Scale	Cronbach's alpha (α)
Cognitive flexibility scale	0.838
General procrastination scale	0.760

Table 1 shows the reliability of all scales in the study. The cognitive flexibility scale has a reliability of .838 and general procrastination scale has a reliability of .760. the cognitive flexibity has a high reliability i.e above 0.7. the general procrastination scale has moderate reliability.

Procedure

Convenient sampling method was used to collect the data from the target samples. The data was collected using Google Forms, focusing on adults aged 18 to 30 from Kerala. A sample size of 249 individuals were taken based on the inclusion and exclusion criteria. The participants were asked to give informed consent first before proceeding to the form. Sociodemographic details were collected first such as name, age, gender,area of living whether urban or rural , the participants subject of study/ degree, parental education, language proficiency and previous semester marks , followed by questionnaires assessing cognitive flexibility and procrastination. . The data collected will be solely used for research and publication purposes. To maintain confidentiality, all data will be coded, ensuring that no personally identifiable information is linked to the responses. The first investigator will be responsible for safeguarding the data, ensuring that it remains protected and confidential throughout the research process, in accordance with ethical research guidelines.

Ethical considerations

This study will adhere to strict ethical guidelines to ensure the rights and well-being of all participants. Participation in the research will be entirely voluntary, and each participant will be required to provide informed consent before taking part in the study. A consent form will outline the purpose of the research, the procedures involved, and the participants' rights, including the

assurance that they may withdraw from the study at any time without any consequences. Confidentiality will be strictly maintained, with all personal information anonymized and used solely for research purposes. Measures will be taken to protect participants, ensuring that the study does not cause any distress or discomfort. Before data collection begins, participants will be fully informed about the study's objectives, and any questions or concerns they may have will be addressed. These ethical considerations will be upheld to maintain the integrity of the research and safeguard the well-being of all individuals involved.

Data analysis

The collected data was analyzed using Jamovi 2.3.28, an open – source statistical software. Descriptive statistics such as man, median, standard deviation were used to summarise key variables. To investigate the relationship between cognitive flexibility, procrastination and academic performance among college students, Spearman' rank correlation was conducted. All statistical testsv were conducted at a 95% confidence level ($p<0.005$) to ensure significance.

Table 2

Normality testing

Variables	Shapiro – wilk w	P
Cognitive flexibility	.971	<.001
Alternate (CFS)	0.992	0.197

Control (CFS)	0.976	<.001
General procastination	0.976	<.001
Academic performance	0.968	<.001

Note: Alternate and control are subscales of cognitive flexibility

Table 2 shows the results of Shapiro- wilk test for normality. The test indicated that all the variables were not normally distributed. W= .971, p <.001 for cognitive flexibility scale, w=0.992, p =0.197 for alternate (cognitive flexibity subscale), W= 0.976, p<.001 for control (cognitive flexibility subscale), W= 0.976, p<.001 for general procrastination scale and w=0.968, p<.001 for academic performance.

Chapter IV

Result and discussion

Results

The results section provides the statistical of the study, including descriptives, correlations. Each hypothesis was analysed using appropriate statistical tests, with tables summarizing key results.

Table 3

Descriptive statistics for cognitive flexibility, general procrastination and academic performance

	MEAN	MEDIAN	SD
Cognitive flexibility	94.2	93	13.98
Alternate (CFS)	64.6	64	11.34
Control (CFS)	29.6	29	5.98
General procrastination	65.2	67	10.28

Academic performance	76.1	76.0	11.13

Note . Alternate and control are subscales of cognitive flexibility

Table 3 presents the descriptive statistics for cognitive flexbibily and its subscale alternate and control, general procrastination and academic performance. The mean cognitive flexibility score was 94.2 (SD = 13.98), with a median of 93. The alternate and control subcomponents had mean scores of 64.6 (SD = 11.34) and 29.6 (SD = 5.98), respectively. General procrastination had a mean of 65.2 (SD = 10.28) and a median of 67, while academic performance showed a mean of 76.1 (SD = 11.13) and a median of 76.

H_{01} – there is no significant relationship between cognitive flexibility and procrastination

H_{02} – there is no significant relationship between cognitive flexibility and academic performance

Table 4

Spearman's correlational analysis between cognitive flexibility and its subscales alternate and control , general procrastination and academic performance

Variables	General procastination	Academic performance
Cognitive flexibility	-0.317***	0.116
Alternate	-0.238***	0.084

control	-0.313***	0.108

Note. *** p <.001

The results show a significant negative relationship between cognitive flexibility and general procrastination ($r = -0.317$, $p < 0.001$), indicating that students with higher cognitive flexibility tend to procrastinate less. Similarly, both the alternate ($r = -0.238$, $p < 0.001$) and control ($r = -0.313$, $p < 0.001$) subcomponents are negatively correlated with procrastination, suggesting that greater flexibility in thinking and self-regulation helps reduce procrastination tendencies. In contrast, the correlations between cognitive flexibility and academic performance ($r = 0.116$), as well as its subcomponents—alternate ($r = 0.084$) and control ($r = 0.108$)—are weak and not statistically significant. This suggests that while cognitive flexibility may influence procrastination, its direct impact on academic performance is less pronounced.

H_{03} – there is no significant relationship between procrastination and academic performance

Table 5

Spearman correlation analysis between general procrastination and academic performance

Variable	Academic performance
General procrastination	-0.147*

Note. * p <.05

The results indicate a weak but statistically significant negative correlation between general procrastination and academic performance ($r = -0.147$, $p < 0.05$), as shown in Table 5. This suggests that students who procrastinate more tend to have lower academic performance.

Discussion

In the discussion chapter, we're diving into what the study found, putting those findings in context with existing literature and theories. We look at why these results matter, how they stack up against previous research, and any surprises we might need to explain. Our goal here is to give a well-rounded view of what this study means, its limitations, and where future research might head.

The study set out to explore how cognitive flexibility and procrastination play into college students' academic performance. Several interesting findings came up - First off, it was found that higher cognitive flexibility is linked to lower procrastination levels. Then, both the ability to shift perspectives and self-regulatory control seem to have a negative correlation with procrastination. Also it was found that cognitive flexibility has a weak and no major relationship with actual academic performance. Lastly, procrastination clearly has a negative impact on academic performance.

Initially, It was thought there would be no real relationship between cognitive flexibility and procrastination. But the study showed a major negative correlation, which means null

hypothesis was rejected. Basically, it suggests that students who are more cognitively flexible tend to put things off less. These findings line up with what others have said, like Demirtas and Ferzan (2021), who found that people with better cognitive flexibility have stronger selfregulation, leading to less procrastination. Gagnon et al. (2019) pointed out that being cognitively inflexible can mess up time management and self-discipline, which are big contributors to procrastination. Cognitive Flexibility Theory (Spiro et al., 1988), which says that people who can switch between different perspectives tend to handle academic challenges better and avoid putting work off. Plus, the Self-Regulation Theory (Baumeister & Heatherton, 1996) shows that cognitive flexibility helps with staying focused and keeping distractions at bay. This backs up the idea that boosting cognitive flexibility through things like cognitive training or mindfulness might help students cut down on procrastination.

Another takeaway was that there's no strong direct link between cognitive flexibility and academic performance, supporting the null hypothesis. This implies that while it might help students adjust to new learning challenges, it doesn't automatically lead to better grades. Similar conclusions were drawn by van der Linden et al. (2018), who found that cognitive flexibility by itself isn't a solid predictor of academic success for university students. However, Diamond (2020) argues that while cognitive flexibility might not drive academic performance directly, it can help with problem-solving, creativity, and resilience, which are all important in learning environments. The Multiple Intelligences Theory (Gardner, 1983) emphasizes that academic performance is shaped by different kinds of intelligence—like logical, linguistic, and interpersonal—not just by cognitive flexibility. What's more, the Dual Process Theory (Evans & Stanovich, 2013) shows that making decisions in academic settings involves both intuitive and analytical thinking. So, while cognitive flexibility helps students adapt, academic success is

likely more tied to effortful, analytical thinking, motivation, and organized learning strategies than just the ability to switch up cognitive approaches. The results from the study emphasize that cognitive flexibility is a key skill, but academic performance relies on a mix of factors, including motivation, discipline, and study strategies.

It was also found that a significant negative correlation between academic performance and procrastination.which means that students who often procrastinate tend to perform worse academically. This fits with what others have found, like Steel and Klingsieck (2016), who did a meta-analysis showing that academic procrastination is a strong predictor of poor performance. Kim and Seo (2021) conducted a longitudinal study showing that procrastination can hurt academic achievement by cutting down on study time, ramping up last-minute stress, and making it harder to retain information. The Temporal Motivation Theory (Steel, 2007) is a great way to understand the tie between procrastination and academic performance. It suggests people put off tasks when rewards seem far away or when immediate distractions seem too tempting. Procrastination leads to hasty work, more stress, and lower-quality learning, which all contribute to declining academic performance. Also, the Self-Determination Theory (Deci & Ryan, 1985) points out that students with low intrinsic motivation are more prone to procrastination, which further hurts their academic success. The results from the study back up these theories by showing that procrastination really does interfere with students' performance.

Chapter V

Conclusion

Key finding

- A significant negative correlation between cognitive flexibility and procrastination. • No significant correlation between cognitive flexibility and academic performance.
- A significant negative correlation between procrastination and academic performance.

Implication

This study simplifies how cognitive flexibility and procrastination play a role in how college students perform academically. Understanding this better can help create targeted strategies in higher education, like cognitive training programs aimed at boosting students' adaptability and decision-making skills. Plus, the insights from this research can really inform curriculum design and academic policies, pushing universities to bring in structured time management training and self-regulation techniques that can help students tackle procrastination and do better in school. It's important to note that cognitive flexibility doesn't directly impact academic performance, so educators might want to try out different approaches, like personalized learning and motivation-based strategies, to improve student outcomes. But there's more to this than just grades. These findings have bigger implications for mental health and student counseling services since procrastination often goes hand-in-hand with stress, anxiety, and not

managing emotions well. Schools could set up support programs that help students deal with procrastination through techniques like mindfulness, goal-setting, and building self-discipline. On top of that, the study also touches on career development and workplace training, since being able to manage time and be cognitively flexible is important for career success. Employers and career advisors can use these insights to create programs that help graduates make a smooth transition into the workforce. Lastly, this research sets the stage for future studies in psychology and education, opening the door for scholars to look deeper into factors like motivation, emotional intelligence, and learning strategies that might influence how cognitive flexibility and procrastination affect academic performance.

Limitations

Even though this study has interesting findings, there are a few limitations that should be mentioned. First off, it mainly looked at college students, which makes it tough to say how these results might apply to other groups like high schoolers or people who are already in the workforce. Things like cognitive flexibility, procrastination, and academic performance can really vary based on age, educational background, or professional environments. So, for future studies, it would be great to see a wider range of participants to make these results more applicable. Also, the study mainly used self-report measures, which can be problem since people might not always share their true procrastination habits or levels of cognitive flexibility, and that can mess with the accuracy of the findings. It might be more effective to include some objective measures, like looking at academic records or actual behavioral assessments, to get a clearer picture of these concepts. Plus, the study had a cross-sectional design, meaning it only looked at

things at one moment in time. This makes it hard to really figure out if there's a cause-and-effect relationship between cognitive flexibility, procrastination, and academic performance. Longitudinal studies could help better understand how these factors play out over time.

Future recommendations

Based on the limitations of the study, there are a few suggestions for future research and how these insights can be used in real life. First off, it'd be great for future studies to mix up the sample population more. By bringing in students from various educational levels, backgrounds, and job settings, it could get a wider view of how cognitive flexibility and procrastination play a role in both academics and careers. Plus, researchers should think about doing longitudinal studies. This way, they can keep an eye on shifts in cognitive flexibility, procrastination, and academic performance over time, helping us better understand how things are actually related. Also, using objective measures like actual academic records, time-tracking tools, or behavioral assessments could give more reliable results and cut down the bias that sometimes comes with self-reports. Future research could dive into intervention-based studies to see if cognitive flexibility training or procrastination management techniques really help improve academic results. Finally, it'd be valuable to check out mediating and moderating factors like motivation, emotional regulation, and self-effectiveness. This could help to get a clearer picture of how these factors interact and lead to figuring out more strategies to help students succeed.

Conclusion

This study explored the relationships between cognitive flexibility, procrastination, and academic performance among college students. The findings revealed a significant negative

correlation between cognitive flexibility and procrastination, indicating that students with greater cognitive adaptability are less likely to procrastinate. However, no significant correlation was found between cognitive flexibility and academic performance, suggesting that while adaptability is beneficial, it does not directly translate into higher academic success. Additionally, a significant negative correlation was observed between procrastination and academic performance, reinforcing the idea that procrastination negatively impacts student achievement. These findings contribute to the growing body of research on student learning behaviors and highlight the importance of addressing procrastination to improve academic outcomes. While cognitive flexibility may help students manage their workload more effectively, other factors such as motivation, time management skills, and self-discipline likely play a stronger role in determining academic success. Given the study's limitations, future research should expand on these findings by using longitudinal designs, objective measures, and intervention-based approaches. Overall, this study emphasizes the need for educational institutions to implement targeted strategies that enhance cognitive flexibility and reduce procrastination, ultimately fostering better academic performance among students. This study investigates the relationship between cognitive flexibility, procrastination, and academic performance among college students. it was found that there’s a significant negative correlation between cognitive flexibility and procrastination. In simple terms, students who are better at adapting to different situations tend to put things off less. However, when it comes to academic performance, there was no significant correlation to cognitive flexibility. So, while being adaptable is a plus, it doesn't automatically mean students will ace their classes. On the other hand, there was a significant negative correlation between procrastination and academic performance, which really drives home the idea that putting things off can hurt students' achievements. These results add to the growing conversation around how students learn and show just how essential it is to tackle

procrastination to boost academic success. Even though cognitive flexibility can help students juggle their workload, other factors like motivation, time management, and self-discipline probably play a bigger role in how well they do academically. Given some limitations in the study, future research should build on these insights by looking at long-term data, using objective measures, and testing out some intervention strategies. All in all, this study emphasizes needing schools to introduce targeted strategies aimed at improving cognitive flexibility and cutting down on procrastination. Eventually, this can lead to better academic performance for students.

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Appendices

Appendix A : Consent form

Greetings dear participant, Iam Aleena Rose, currently pursuing ,MSC psychology at St. Teresa's College,. Ernakulam. As part of my academics iam conducting a research on the Relationship between cognitive flexibility, procrastination and academic performance. The study is open to individuals aged 18-30 who possess a sufficient understanding of the English language. If you meet these criteria you are eligible to participate. If you agree to participate in this study, you will be asked to complete a questionnaire that will take approximately 5 to 10 minutes to complete. your participation is voluntary, you may withraw at any time without any penalty. All information will be kept confidential. Your responses will be anonymous , your data will only be used for research purposes. By continuing with the survey, you are giving your informed consent to participate in this study. Thank you for your cooperation and participation.

Appendix B: socio-demographic details

Email id

Name

Age

Gender

Education

Degree course Socio-

economic status

Area of living

Mothers education Fathers

education how many languages do

you speak?

Previous semester marks in percentage

Appendix C: Cognitive Flexibility Scale

This questionnaire contains 20 statements. For each statement, please read it carefully and select the response that most accurately reflects your opinion or experience. The available response options are: Strongly Disagree, Disagree, Somewhat Disagree, Neutral, Somewhat

Agree, Agree, and Strongly Agree. Choose the option that best aligns with your thoughts or feelings regarding each statement.

1. I am good at "sizing up"situations
2. I have a hard time making decisions when faced with difficult situations
3. I consider multiple options before making a decision
4. When I encounter difficult situations, I feel like I am losing control
5. I like to look at difficult situations from many different angles
6. I seek additional information not immediately available before attributing causes to behaviour
7. When encountering difficult situations, I become so stressed that I can not think of a way to resolve the situation
8. I try to think about things from another person's point of view
9. I find it troublesome that there are so many different ways to deal with difficult situations
10. I am good at putting myself in others' shoes
11. When I encounter difficult situations, I just don't know what to do
12. It is important to look at difficult situations from many angles
13. When in difficult situations, I consider multiple options before deciding how to behave
14. I often look at a situation from different view-points

15. I am capable of overcoming the difficulties in life that I face

16. I consider all the available facts and information when attributing causes to behaviour

17. I feel I have no power to change things in difficult situations

18. When I encounter difficult situations, I stop and try to think of several ways to resolve it

19. I can think of more than one way to resolve a difficult situation I'm confronted with

20. I consider multiple options before responding to difficult situations.

Appendix D : General Procrastination Scale

This questionnaire consists of 23 statements. For each statement, please read it carefully and choose the response that best represents how frequently it applies to you. The available

response options are: Never, Rarely, Sometimes, Often, and Always. Please select the option that most closely reflects your experience or behavior for each statement.

1. I often try to avoid doing a task that I have little or no interest in.
2. I often delay tasks that are desirable to me
3. When a task is highly stressful, I'm likely to put in more effort.
4. I think that certain problems can subside or be solved on their own, with a passage of time.
5. I begin work immediately on a task once it has been given to me.
6. I have often had services terminated because of unpaid bills.
7. I often delay attending to medical issues concerning my health.
8. I prefer submitting an assignment before the deadline.
9. I generally don't start working on a project or assignment immediately.
10. I am usually late when I have to go out and meet friends for a movie or dinner or other such plans.
11. I often put off doing tasks until urgency develops.
12. Whenever I make a plan of action, I follow it.
13. I think too much about things I would like to do but rarely get around to doing them.
14. I tend to work at the eleventh hour for a task or project.
15. I postpone my chores to a later time when something more interesting comes up.

16. I prefer planning ahead for tasks and events.

17. I needlessly delay finishing jobs, even when they're important.

18. I prefer working on one assignment at a time.

19. I do not complete tasks until I am insisted to complete them.

20. I am generally late at the workplace or college

21. I try to avoid any backlog of work.

22. I delay the tasks that distress me.

23. I feel guilty when I delay doing tasks