Predictive Role of Cognitive Functioning and Self-generated Thoughts on Problem Solving and Mental Wellbeing among University Students: A Cross-sectional Study

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I, Fatima Syed, D/O Syed Nusrat Hussain, Registration # NUML-S22-31293, Discipline: **Psychology**, Candidate of **Masters of Philosophy** at the National University of Modern Languages, Islamabad hereby declare that the thesis **"Predictive Role of Cognitive Functioning and Self-generated Thoughts on Problem Solving and Mental Wellbeing among University Students: A Cross-sectional Study"** submitted by me in partial fulfillment of MPhil degree, is my original work, and has not been submitted or published earlier. I also solemnly declare that it shall not, in future, be submitted by me for obtaining any other degree from this or any other university or institution.

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Predictive Role of Cognitive Functioning and Self-generated Thoughts on Problem Solving and Mental Wellbeing among University Students: A Cross-sectional Study

Abstract

Problem-solving and mental wellbeing have been demonstrated to be vital for students' academic and personal success, yet their cognitive and psychological mechanisms remain underexplored. This study examines the predictive role of cognitive functioning and self-generated thoughts on problem-solving and mental well-being among university students. Specifically, it examines how positive constructive daydreaming, guilt and fear-of-failure-related daydreaming, and poor attentional control impact problem-solving and mental well-being. The study employed a cross-sectional design with a sample of 400 university students, recruited through convenience sampling from various academic institutions. Participants completed standardized self-report measures that assessed the core constructs of the study. Data were collected using the Cognitive Functioning Self-Assessment Scale to measure cognitive functioning, the Short Imaginal Process Inventory (SIPI) to assess self-generated thoughts, the Problem Solving Inventory to evaluate problem-solving ability, and the Warwick-Edinburgh Mental Wellbeing Scale to assess overall mental wellbeing. Mediation analyses examined the indirect effects of cognitive functioning and self-generated thoughts on problem-solving and mental wellbeing. Results indicate that poor attentional control negatively affects problem-solving, while positive constructive daydreaming enhances cognitive outcomes and adaptive strategies. In contrast, guilt- and fear-of-failure-related daydreaming contributes to psychological distress, impairing problem-solving. These findings highlight the interplay between cognitive processes and self-generated thoughts in academic resilience and well-being. Implications for educational and mental health interventions are discussed, with recommendations for future research on the long-term effects of cognitive and emotional factors on problem-solving.

Keywords: Cognitive functioning, self-generated thoughts, problem-solving, mental well-being, university students, attentional control, daydreaming

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LIST OF ABBREVIATIONS

CFSS	Cognitive Functioning Self-Assessment Scale
SIPI	Short Imaginal Process Inventory
PSI	Problem Solving Inventory
WEMWBS	Warwick-Edinburgh Mental Wellbeing Scale
M	Mean
SD	Standard Deviation
Df	Degrees of Freedom
SPSS	Statistical Package for the Social Sciences
APA	American Psychological Association
CF	Cognitive Functioning
SGTS	Self-generated Thoughts
PCD	Positive Constructive Daydreaming
GFFD	Guilt & Fear of Failure Daydreaming
PAC	Poor Attentional Control
PS	Problem Solving
MWB	Mental Wellbeing
SD	Standard Deviation
N	Total Number of Participants
n	Subsample Size
T	t-test Statistic
F	F-test Statistic

p	Probability Value
α	Level of Significance (Alpha)
r	Pearson's Correlation Coefficient
CI	Confidence Interval
LL	Lower limit
UL	Upper limit
ANOVA	Analysis of Variance

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Fatima Syed

DEDICATION

To my **beloved parents**, your endless love, silent sacrifices, and unwavering prayers have been the strength behind every step of my journey.

This humble effort is dedicated to you, with all my heart.

Chapter 1

INTRODUCTION

1.1. Context of the study

The progression to university life often represents a pivotal period marked by notable academic, social, and personal challenges. For university students, navigating these challenges effectively requires robust problem-solving abilities and the maintenance of mental well-being. Among the variables under investigation, cognitive functioning (CF) and self-generated thoughts (SGTs) are deemed significant in elucidating the manner in which students manage such circumstances demands. This paper aims to focus on the predictive capability of cognitive functioning and self-generated thoughts on the problem-solving capabilities and the mental wellbeing of university students. In accordance with the content regulation hypothesis that serves as the foundation for this research, this study seeks to enhance the comprehension of these relationships within this context.

Cognitive functioning comprises a varied spectrum of abilities such as perception, social cognition, attention, language processing, and memory, among many other capabilities, all of which help in the development of reasonable strategies of dealing with a given set of challenges in day-to-day life. Literary works emphasize that elevated levels of cognitive ability are crucial for effective problem-solving, addressing complex challenges, and managing stress effectively (Diamond, 2013). Deficits and reserves in cognitive resources may influence problem-solving abilities and the overall quality of mental wellbeing, potentially mediated by self-generated mentation.

The concept of self-generated thoughts can be understood as cognitive processes occurring within an individual that are not necessarily influenced by external factors. Although the emergence of such thoughts can enhance creativity and facilitate effective

planning, it is important to recognize that they may also interfere with the execution of immediate tasks or amplify negative emotions (Smallwood & Schooler, 2015). The content regulation hypothesis posits that the nature and themes of our self-generated thoughts can significantly impact outcomes. This hypothesis serves as a theoretical framework for investigating how these self-produced reflections may elucidate the relationship between cognitive capacity and specific results.

Problem-solving (PS) alludes to an individual's ability to perceive, evaluate and deal with issues in an effective and efficient manner. This competency is essential for effective learning and plays a significant role in the daily activities of individuals within an academic environment. (Jonassen, 2011). The concept of Mental Well-Being (MWB) on the other hand pertains to the emotional, psychological, and social dimensions of life. It signifies a state of complete functioning and mental wellbeing, emphasizing the importance of maintaining a balanced and positive mindset in both personal and professional environments. (Keyes, 2002). Problem solving is a complex cognitive process that is intertwined with the emotional experiences of those involved. Understanding how self-generated thoughts serve as a mediator provides a unique perspective on how intricate thought processes contribute to effective problem solving and the preservation of mental wellbeing.

Cognitive skills are essential for students, as they significantly influence their thinking processes, time management abilities, and capacity to fulfill the responsibilities expected of them in educational settings. It is important to recognize that university students may face various cognitive challenges due to factors such as high academic pressure, insufficient sleep, and elevated stress levels. Understanding these hurdles can help create a supportive learning environment that fosters their academic success (Bayram & Bilgel, 2008). These problems limit their concentration ability, memory, and decision-making processes, serving as critically important skills that one requires to solve problems and in personal development. Several

studies show that university students generate SGTs more often: due to academic stress, pressure, and use of social media, among others. Statistics reveal that overall, 46% of university students were documented being overstressed, which increases the frequency of SGT employed when under high stress (Beiter et al., 2015). Portability of devices also extends to students, where the devices offering entertainment and mobility away from the existing environment; social media also triggers comparison which ultimately culminates the generation of self-stimulating thoughts; with the constant use of the devices taking place every few minutes while studying or attending a class (Rosen et al., 2013). Moreover, since emerging adulthood is characterized by cognitive and emotional development that involves the ability to solve various academic and other kinds of problems, the level of SGTs rises (Arnett, 2000).

Furthermore, university students aged 18-22 in Pakistan face considerable pressures related to their academics, thereby increased mental wellbeing problems among university students (Mirza & Jenkins, 2004). It is necessary to delve into how cognitive functioning and self-generated thoughts influence problem-solving and overall mental well-being in this domain. The research will also be instrumental in unfolding functional counseling strategies for students encountering mental wellbeing challenges that may adversely affect their academic performance. The study exhibits several important theoretical and practical implications. The study explicitly scrutinizes cognitive functioning, self-generated thoughts, and their impact on problem-solving abilities, in conjunction with the mental well-being of university students. The objective is to assess how internal cognitive processes affect student performance when faced with various external challenges. The culturally grounded applicability of the findings may help to design and implement the interventions aimed at improving cognitive-emotional resources of university students to promote academic

achievement and quality of life.

1.2. Rationale

This study offers valuable insights by addressing an underexplored yet critical area in psychological research: the reciprocal influence of cognitive functioning and self-generated thoughts (SGTs) on university students' problem-solving skills and mental wellbeing. While both cognitive functioning and SGTs have been extensively studied, their interconnected impact particularly in the form of mediation through different types of SGTs remains insufficiently understood in young adult academic populations. Grounded in the Content Regulation Hypothesis (Smallwood & Andrews-Hanna, 2013), which posits that the content and context of self-generated thoughts determine their cognitive and emotional outcomes, this study focuses on the mediating role of SGTs. While cognitive functioning provides the mental capacity for attention, working memory, and executive control, which are essential for generating self-generated thoughts. Depending on their nature (adaptive or maladaptive), SGTs can either facilitate or hinder effective problem-solving and impact one's mental wellbeing. Thus, the study posits that SGTs mediate the pathway from cognitive functioning to psychological outcomes. The theory suggests that positively oriented daydreams, such as those involving imaginative thinking and personal goals, may enhance cognitive outcomes and wellbeing, whereas negatively valenced or poorly regulated SGTs may impair both cognitive and emotional outcomes (Smallwood & Schooler, 2015).

University students frequently face academic pressures, time management challenges, and personal stressors, which can tax their cognitive resources and trigger self-generated thoughts. These thoughts can be adaptive or maladaptive, depending on their content and emotional tone (Zedelius & Schooler, 2016). The present study examines three specific types of SGTs: positive constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control. Positive constructive daydreaming has been

associated with enhanced creativity, problem-solving, and emotional resilience (McMillan, Kaufman, & Singer, 2013), while guilt and fear of failure daydreaming are linked with performance anxiety and internalized academic pressure (Kane, Smeekes, & Lickel, 2017). On the other hand, poor attentional control, often manifesting as uncontrolled mind wandering, has been associated with reduced executive functioning and increased vulnerability to anxiety and depression (Marcusson-Clavertz, Kjell, Persson, & Cardeña, 2019).

Although prior research has identified broad associations between mind wandering and mood or performance of university students, few studies have explored how specific themes of self-generated thoughts relate to other psychological constructs particularly within non-Western or student populations. Exploring these mediational pathways is critical to understanding why students with similar cognitive abilities may exhibit different academic or emotional outcomes depending on their internal thought patterns. Mind wandering and daydreaming are highly prevalent among university students, with reports suggesting that over 70% of students engage in such thought processes during academic activities (Killingsworth & Gilbert, 2010). More recent findings also emphasize that the cognitive and emotional consequences of self-generated thought vary significantly based on its structure, valence, and context (Wang et al., 2020).

In the South Asian and Pakistani context, research has also begun to recognize the impact of internal cognitive processes on student's functioning. Study by Fatima and Parveen (2021) found that Pakistani students experiencing excessive negative ruminations demonstrated poorer academic problem-solving and lower mental wellbeing. Similarly, Rehman et al. (2020) highlighted how cognitive overload and stress contribute to unproductive mind-wandering, which in turn undermines academic focus and motivation. These findings underscore the relevance of studying SGTs in relation to cognitive and

emotional outcomes within indigenous academic contexts. This makes it imperative to explore SGTs not as a unitary construct, but as a multifaceted phenomenon with both constructive and disruptive forms. By examining how cognitive functioning interacts with specific types of SGTs to influence problem-solving ability and mental wellbeing, this study aims to fill a significant gap in the literature. It contributes to a nuanced understanding of the dual nature of SGTs as both facilitators and inhibitors of performance and wellbeing within the framework of the Content Regulation Hypothesis. The findings are expected to inform targeted interventions aimed at promoting adaptive daydreaming styles and improving cognitive and emotional outcomes in university students.

1.3. Problem Statement

To examine the predictive role of cognitive functioning and self-generated thoughts in problem-solving and mental well-being among university students, with a focus on the mediating role of self-generated thoughts and its implications for effective cognitive and emotional regulation.

1.4. Research Objectives

The study aimed to explore the following objectives:

1. To investigate the relationship between cognitive functioning, self-generated thoughts (positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control), problem solving and mental well-being among university students.
2. To examine the mediating role of self-generated thoughts (i.e., positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control) in the relationship between cognitive functioning, and problem solving among university students.

3. To examine the mediating role of self-generated thoughts (i.e., positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control) in the relationship between cognitive functioning, and mental well-being among university students.
4. To analyze group differences in cognitive functioning, self-generated thoughts, problem solving, and mental well-being based on demographic variables among university students.

1.5. Research hypotheses

1. Cognitive functioning is positively associated with problem solving and mental well-being among university students.
2. Cognitive functioning exhibits a positive relationship with positive constructive daydreaming among university students.
3. Cognitive functioning has a negative relationship with daydreaming related to guilt and fear of failure and poor attentional control, among university students.
4. Positive constructive daydreaming is positively associated with problem solving and mental well-being, among university students.
5. Daydreaming driven by guilt and fear of failure is negatively related to problem solving and mental well-being among university students.
6. Poor attentional control is negatively associated with problem solving and mental well-being among university students.
7. Self-generated thoughts (i.e., positive constructive daydreaming, guilt and fear of failure daydreaming and poor attentional control) mediate the relationship between cognitive functioning and problem-solving among university students.
8. Self-generated thoughts (i.e., positive constructive daydreaming, guilt and fear of failure daydreaming and poor attentional control) mediate the relationship between cognitive functioning and mental well-being among university students.

1.6. Conceptual Framework of the Study

Based on the theoretical underpinnings and empirical evidence, the proposed conceptual framework for this research investigates the predictive role of cognitive functioning (CF) on problem-solving (PS) and mental well-being (MWB) among university students. The framework positions self-generated thoughts (SGTs) as a mediating variable, highlighting their dual role based on their regulation and alignment with situational demand.

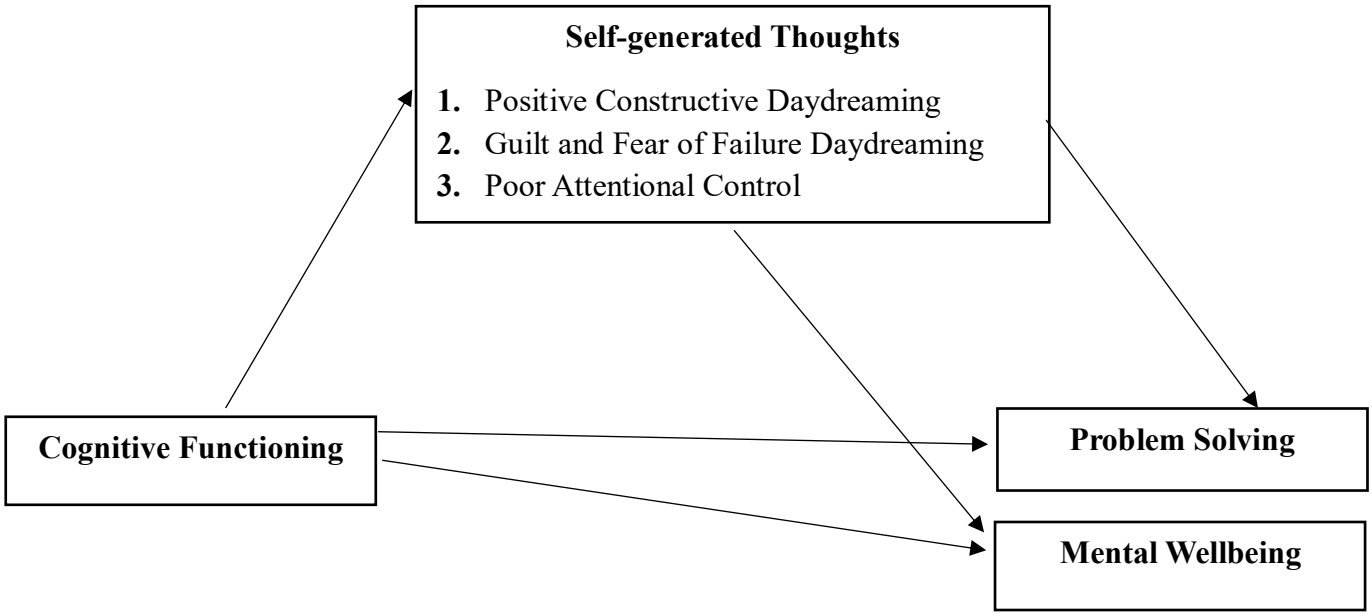

Figure 1. Figure showing the Model of Relationship between cognitive functioning, problem solving, mental wellbeing and the mediating role of self-generated thoughts.

1.7. Significance of Study

The significance of this study lies in examining the predictive role of cognitive functioning and self-generated thoughts in shaping problem-solving abilities and mental wellbeing among university students. The investigation centers on one of the significant developmental phases that presents academic, social, and emotional difficulties among individuals. Most prominently SGTs are typically experienced by individuals aged 18-25

particularly in students due to the high cognitive and emotional challenges tied with this milestone of life (Smallwood et al., 2013). This age group is likely to spend more time reflecting on the things around them, which negatively impacts the cognitive performance as well as their overall mental wellbeing (Baird et al., 2011). This study advances the current theoretical framework surrounding self-generated thoughts by incorporating content regulation hypotheses, while emphasizing both the inherent nature of these thoughts and their situational contexts. A comprehensive understanding of these processes is vital for students, as it enables them to effectively manage stressors, enhance problem-solving efficiency, and promote better mental wellbeing outcomes. The implications based on the findings provide an understanding of how cognitive training programs can be useful for individuals at this developmental phase helping them become emotionally grounded generation. This disclosure might enlighten instructors, educators, counselors and policy makers on ways of providing a conducive environment for university students' academic success in addition to their psycho-social wellbeing.

1.8. Methodology

Multiple measures were employed to assess students' cognitive functioning, SGTs, problem-solving abilities, and mental wellbeing. Review of literature pertinent to the study navigated the framework of the study. Convenience sampling method was implemented by targeting university students with the goal of having a diverse sample. Data was collected in two intervals, with the first interval comprising the pilot study, reliability and validity of the instruments were examined, the interrelationship among the variables under study was assessed. Concurrently the second interval entailed the main study, where the data was obtained through structured questionnaires. Data was therefore analyzed to determine how SGTs mediate cognitive functioning, problem solving and levels of mental well-being among

university students. The findings are disclosed from the vantage point of educational and mental wellbeing interventions with recommendations for further studies.

1.9. Delimitations

The current study has several limitations that should be acknowledged. Firstly, potential confounding variables such as sleep quality, physical health, and social support, which are known to influence cognitive functioning and mental well-being, were not included in the analysis. Secondly, while self-report measures were appropriate for the survey design, their reliance introduces the possibility of social desirability bias, potentially limiting the objectivity of the results. Lastly, the sample size of 400 participants, though adequate for this study, may limit the generalizability of the results.

1.10. Operational definitions

1.10.1. Cognitive Functioning. Cognitive functioning is defined as "the overarching capacity of an individual's mental processes, encompassing various aspects such as attention, memory, language comprehension, perception, decision-making, and executive functions. It involves acquiring, processing, storing, and utilizing information to navigate and interact with the environment effectively (Sharma & Chatterjee, 2021)." Individuals scoring high on the Cognitive Functioning Self-Assessment Scale will be treated as having alleviated self-perceived cognitive functioning. While those scoring low on this scale will indicate a worse self-perception regarding cognitive functioning.

1.10.2. Self-generated Thoughts. Self-generated thoughts (SGT) are followed by practicing daydreaming and mind-wandering, which depicts that our mind can generate thoughts in a stimulus-independent mode (Smallwood, 2013), by utilizing the existing knowledge. Individuals with higher scores on the Short Imaginal Process Inventory typically indicate a strong propensity for vivid and immersive imagination, suggesting that individuals

scoring high may have a rich inner fantasy life or be highly adept at mentally simulating scenarios and experiences, while those with lower scores may suggest a lesser inclination towards vivid and immersive imagination. Individuals with low scores may tend to rely more on concrete thinking and have difficulty engaging in imaginative or creative processes. The Short Imaginal Processes Inventory (Singer & Antrobus, 1970) was selected due to its strong theoretical foundation and its continued relevance in assessing dimensions of self-generated thought. Despite its age, the instrument remains widely cited and has demonstrated robust psychometric properties in both classic and contemporary research, making it suitable for the present study's objectives.

1.10.2.1. Positive Constructive Daydreaming refers to the tendency to engage in pleasant, imaginative, and purposeful inner experiences. Individuals scoring high on this subscale believe that daydreams are worthwhile and can help solve problems, generate original ideas, and evoke warm, pleasant feelings. These daydreams often have vivid visual and auditory qualities and are perceived as helpful for planning alternatives and providing meaningful insights. They typically involve a future timeframe and are seen as cognitively and emotionally enriching.

1.10.2.2. Guilt and Fear of Failure Daydreaming (GFFD) subscale captures self-generated thoughts characterized by distressing, fear-driven, and anxiety-laden themes. High scorers tend to experience daydreams with depressing, frightening, or panicky qualities. Their thoughts may include fantasies about failing responsibilities, losing loved ones, feeling guilty, or being exposed for wrongdoings. They may also imagine winning awards or being recognized, but such fantasies are often entangled with underlying fears of inadequacy, anger, or emotional conflict.

1.10.2.3. Poor Attentional Control (PAC) reflects difficulties in maintaining sustained cognitive focus and resisting distractions. Individuals with high scores on this subscale display a marked tendency toward mind-wandering and drifting thoughts. They easily lose interest, become bored quickly, and struggle to maintain attention on tasks for extended periods. Distractions such as talking, television, or other stimuli readily disrupt their concentration, impeding productive or goal-oriented cognitive engagement.

1.10.3. Problem Solving. Problem-solving is defined as "an individual's ability to adopt strategies to resolve dilemmas encountered in daily life activities (D'Zurilla & Nezu, 1999)." Thus, it refers to one's conceptualization of oneself as an effective problem solver (having confidence and personal control in approaching problems; Heppner, 1988). High scores on the Problem-Solving Inventory reflect individuals with self-appraisal as effective problem-solvers, whereas individuals with low scores indicate self-appraisal as ineffective problem solvers.

1.10.4. Mental Wellbeing. Mental well-being refers to a person's psychological functioning, life satisfaction, and ability to develop and maintain mutually beneficial relationships. Psychological well-being includes the ability to maintain a sense of autonomy, self-acceptance, personal growth, purpose in life, and self-esteem. (Ryan & Deci, 2001). High scores on the Warwick-Edinburgh Mental Well-being Scale typically indicate a higher level of mental well-being, suggesting that individuals scoring high are experiencing a greater sense of overall psychological health, happiness, and life satisfaction conversely low scores depict a lower level of mental well-being, suggesting that individuals scoring low may experience reduced psychological health, lower levels of happiness, and diminished overall life satisfaction.

CHAPTER 2

2. LITERATURE REVIEW

Cognitive functioning (CF), self-generated thoughts (SGTs), problem-solving (PS), and mental well-being (MWB) form the foundation of human adaptability and success, particularly among university students. Cognitive functioning and self-generated thoughts play an integral role in university students' lives in managing academic difficulties and receiving psychosocial gains. Studies signifies that higher levels of cognition and constructive SGTs lead to problem solving, academics achievement, and better mental well-being among individuals. These frameworks also play a significant role in identity development, boosting self-confidence and in development of social relationships. On the other hand, students with poorer intellect or maladaptive self-generated thoughts (SGTs) may fail academically, experience pressure, anxiety and have poor self-esteem. This interrupts the individual's capacity to develop interpersonal interactions and have optimal conditions for his/her growth and mental well-being (Salthouse, 2004; Smallwood & O'Connor, 2011). This review critically evaluates the literature on these variables, identifies gaps, and underscores their interconnectedness

2.1. Cognitive functioning

Cognitive functioning, comprising a spectrum of mental processes such as memory, attention, and executive functions, plays an essential role in academic achievement and mental well-being. University students rely on these processes to manage diverse academic and social demands. High levels of CF are linked to better academic performance and coping skills, whereas deficits can result in suboptimal outcomes (Alloway & Alloway, 2010).

University students, generally aged between 18 and 24 years, are at a crucial stage of cognitive development, characterized by enhanced executive function, problem-solving

skills, and the ability to process complex information (Blakemore & Choudhury, 2006). This stage is also marked by increased neural plasticity, allowing students to acquire and refine cognitive skills more readily. However, the cognitive challenges faced in university require students to engage in higher order thinking and self-regulation, which can be taxing if not properly supported.

Research by Chick (2007) suggests that students in university environments benefit from exposure to diverse perspectives and complex academic tasks, which can foster cognitive growth. However, these cognitive gains are often contingent upon individual factors such as prior academic preparation, motivation, adaptive and maladaptive thinking patterns, and the ability to manage academic demands effectively.

A seminal study by Salthouse (2004) underscores the significance of cognitive abilities in academic contexts. Salthouse concluded that cognition is positively related to academic achievement; this is in terms of such abilities as hippocampus and executive control. With students having high cognitive ability, they are more likely to get better class grades and better at solving problems efficiently and effectively.

In Pakistan, research carried out by Mirza and Jenkins (2004) revealed the metrics of cognitive and psychological problems among university students. The findings established that about 40% of students exhibit significant cognitive obstacles and psychological dysfunction, which hinder their learning as well as trigger general mental wellbeing issues. Among university students, academic pressure, multitasking, and poor time management often impair cognitive efficiency, leading to negative outcomes in both academic and mental domains (Mahmood & Saleem, 2022).

In the local context, research by Aslam and Kamal (2020) found that poor cognitive control among Pakistani undergraduates was linked to maladaptive coping strategies and

lower academic adjustment. Another study by Riaz and Shakoor (2019) reported that deficits in executive functioning predicted higher levels of academic burnout in Pakistani university students. These findings underscore the relevance of assessing cognitive functioning specifically within the student population in Pakistan. Khan and Mushtaq (2020) reported that university students facing cognitive overload due to academic pressures demonstrated reduced performance and higher anxiety levels. Similarly, Yousaf & Riaz (2023) showed that deficits in cognitive processing were associated with poor time management and ineffective academic coping in Pakistani students. These findings emphasize the relevance of studying cognitive functioning in this demographic, where students often deal with limited academic support and high expectations. This situation calls for an urgent need to develop interventions focusing on cognitive ability and mental wellbeing issues in academic institutions in Pakistan.

Cognitive difficulties in university students is one of the greatest challenges that are induced by stress. With university stressors including challenges like academic strain, time management, financial burden and the in formidable social adjustment problems among the students. Stress that is prolonged is known to have negative impacts on cognitive functioning by affecting different regions of brain associated with learning, attention, memory, and decision making.

Outlined by Lupien et al. (2009), chronic stress, indicated by the presence of cortisol in body, may prove to be detrimental to the hippocampus pivotal in encoding of information and subsequent memory. Stress also affects concentration level and memory resulting in poor performance by students. In addition, stress directly impacts cognitive inefficiencies by creating unhealthy coping mechanisms like procrastination (Beck, 2017). Recent studies have highlighted that diminished cognitive functioning is significantly associated with lower academic performance and increased vulnerability to stress (Cadar et al., 2020).

Another component affecting cognitive functioning is the amount of sleep an individual receives. Findings underscored that university students have poor sleep quality or difficulties related to quality sleep due to irregularities in their daily lifestyle, social activities or academic demands (Hershner, & Chervin, 2014). Reduced sleep duration affects several cognitive activities such as attention, memory and decision making, among others (Walker, 2017).

Dewald-Kaufmann et al. (2013) highlighted that, students who received ample and healthy sleep also had no intellectual difficulties than those suffering from sleep deprivation. In addition, lack of sleep has been cited in conjunction to heightened cortisol levels and depression, and stress eventually leading to cognitive challenges.

Thompson & Blair (2018) accentuated the role that sleep plays in cognitive functioning and other related processes. The study established that sleep is necessary in enhancing cognitive efficiency with students performing 20% better in intellect tests after receiving eight hours of sleep at night. This research finding clearly supports the notion that aspects of lifestyle influence overall cognitive output.

Longitudinal research done by Petersen et al. emphasizes the impact of cognitive functioning on academic performance for five years. The work further identified that students who at the beginning of the study, had above average cognitive abilities, performed better in academic tasks in the study. The study unveiled a 20% improvement in academic performance of the students with good cognitive abilities, clearly indicating that the cognitive enhancement are endured over long-term.

Cortese et al. (2016) in their meta-analysis provide evidence that one's cognitive functioning significantly influences academic performance and mental wellbeing. Findings revealed that improvements in cognitive skills through interventions could increase academic

performance by twenty-five percent as well as reduce mental deficiencies by twenty percent, highlighting the spectrum of benefits resulting from cognitive enhancement interventions. More recent work by Nguyen et al. (2020) adds more depth to the degree of cognitive processes and its influence in a student's life. The outcomes revealed that cognitive flexibility facilitates adapting to the campus environment in university settings. With the one displaying higher levels of cognitive flexibility, they are likely to be 15% more successful in adapting to the new environment. The exploration scrutinizes how cognitive functioning is of fluid nature and has its implications in academic success.

Sharma and Singh (2020) investigated the role those cognitive abilities played in the problem solving among university students. Based on their investigation, their study showed that those students who had higher aptitude were those who solved more problems and had better academic achievements. For instance, students with superior memory and executive functions performed 25% better on problem-solving tasks, reinforcing the link between cognitive skills and academic success.

Wingo et al. (2010) examined whether cognitive functioning serves to be a predictor of mental wellbeing among individuals and deduced that cognitive impairment is an identifier for mental wellbeing problems. The results indicated that students with declined cognitive ability were 35% more likely to develop or be diagnosed with depression, anxiety stress, implying that cognitive functioning serves a crucial role in toning down problems related to mental wellbeing. Moisala et al. (2016) embarked on a study directed to inquire into the association between cognitive functioning and psychological wellbeing of university students. The research established that there is a direct relationship between high cognitive functioning and low stress and anxiety levels whereby the former is a buffer against poor health of the latter. The results underscore the statistics that students with enhanced cognitive

capacity reported 30% fewer issues related to mental wellbeing than others, emphasizing the inclusion of cognitive excellence in academic institutions.

Additionally, Lee et al. (2019) conducted similar exploratory research that aimed at investigating the neural correlates of high cognition using neuroimaging. They identified that students with enhanced connectivity within the prefrontal cortex and hippocampus had better cognitive abilities, hence supporting the biological framework for cognitive interventions in university settings.

University students possess contrasting cognitive abilities since they come from different SES, cultural setting, gender, origin, with regards to geography, and neurodiversity. These demographic variables impact cognitive functioning outcomes via their impact on stress, education, social support and health aspects.

Students in economically developed nations hold an advantage that enables the development of critical and creative abilities in them. Thus, although there are these countries, and they may differ from each other, significant differences within them are also related to cognitive achievement. Previous studies reveal that more stressed students come from low socioeconomic families, because of insecurity of income that affects their working memory and their executive functioning (Evans & Schamberg, 2009). Socioeconomic stress, defined as low socioeconomic status, racial and ethnic discrimination in America, was found to keep the hypothalamic pituitary adrenal (HPA) stress system active for longer periods, which affected the executive or the frontal and hippocampal systems critical for learning in the brain (Lupien et al., 2009).

On the other hand, internal factors affecting cognitive development are poor educational facilities and to a certain extent lack of proper nutrition, as well as external factors like instability in the political system in the lower- and middle-income countries. A

cross-sectional study on students in rural India revealed that any form of malnutrition during developmental stages leads to irreversible impairments of cognitive skills the child is likely to exhibit in the future, exhibiting in domains like attention and memory (Grantham McGregor et al., 2007). Lack of resources to cater for necessary expenses and the general challenge of having to balance work and family responsibilities cause chronic stress, in Sub-Saharan Africa, thus reducing efficiency in making sound decisions and negative impacts on cognition.

Gender differences emerge in cognitive functioning in various contexts. In patriarchal societies culture, female students encounter systemic limitations such as early marriage and lack of support for college education, that in turn affects their cognitive ability through limitations on knowledge experience (Nussbaum, 2011). Male students are also known to face a lot of social demands of having monetary independence, thus developing stress, and diminishing their intellectual functioning by impacting their attention and decision making (Frydenberg et al., 2009). These gaps are augmented by traditional gender roles, which tend to widen the gaps in terms of the cognitive ability of students.

Culture, being part of the identity of an individual can significantly affect how an individual inculcates knowledge. While in collectivist culture, namely East Asia, the education system prioritizes collaborative activities with a focus on other people's perspectives and views. This cultural orientation leads to an improvement in specific areas like the social cognitive and problem-solving tasks as noted by Markus and Kitayama (1991). On the other hand, students from collectivistic cultures that include western Europe and North American emphasize individual critical thinking and self-motivated learning as these values are espoused by cultures of education in the said countries (Heine, 2001).

Geographic location is also another important factor that determines cognitive functioning. Students from rural regions often encounter cognitive barriers because they do not have adequate exposure to education and academic settings. Study done in Brazil revealed that students from rural areas had significantly poorer working memory and problem solving in an overall comparison with their counterparts from urban areas, the difference being largely attributed to differences in stimulation (Oliveira et al., 2015). In contrast, urban students have more opportunities to access resources in their study than rural students do; however, obstacles like noise pollution and a different competitive academic environment affect cognitive functions encompassing attention and memory (Stansfeld & Matheson, 2003).

Smallwood and Schooler (2015) explored the duality of SGTs and their association with cognitive functioning. The study disclosed that types of SGTs, including constructive daydreaming, are beneficial for the generation of new ideas. Mind wandering can also be detrimental to performance in activities that demand focused attention and inhibition of cognitive control. Study proved that the majority of people spend about 46.8% of their wakefulness in self-generated mentation's, which hinders academic activities that require concentration. This dichotomy underscores the importance of balancing cognitive efforts to optimize performance. In another study, Baker and Berenbaum (2021) asserted that imaginal processes are linked to cognitive functions. They discovered that students with higher cognitive abilities were able to effectively and efficiently monitor their thoughts and feelings, with the common tendency of performing well academically. Effective cognitive functioning supports the capability of thought regulation skills by decreasing mental strain and boosting attention.

Daydreaming and attentional control were explored by McVay and Kane (2010) in their literary work. They established that individuals with more refined attentional control

tend to experience less interference resulting in reduced mind wandering affecting the overall enhanced performance in cognitive tasks. This is in harmony with the research outcomes of Unsworth and McMillan (2013) where attentional control was cited to be a predictor of cognitive performance. Positing that increased attentional control helps reduce the effects of these maladaptive SGTs while boosting the outcomes of cognitive functioning.

Executive resources for future-oriented SGTs such as goal setting and planning have been underscored to improve motivational regulation and academic achievement by guiding in the direction of long-term objectives (Stawarczyk, et al., 2013). Students with increased levels of CF are more inclined to generate adaptive SGTs and sustain them as well. This suggests a plausible mediating role of self-generated mentation's in context of relationship between cognitive functioning and the proposed outcomes.

It is therefore illustrative to focus on the maladaptive SGTs as well to better understand the negative mediation effects, entailing rumination and worry. Self-perpetuating thinking or guilt and fear of failure leads to poor performance in academic tasks and deficits in skills needed for academic success (Lyubomirsky et al., 2006). Worry, defined as the thoughts about the future, negative events and their consequences, aggravates this process even more as it eliminates the necessary cognitive resources for fulfilling the existing tasks (Borkovec et al., 2004).

2.2. Self-generated Thoughts

The phenomenon of self-generated thoughts (SGTs), ranging from the beneficial or positive constructive daydreaming to ruminative thinking, greatly affects university students. These are unpredictable ideas that appear by themselves and have been the topic of interest for many research studies concerning their effects on the cognition, problem solving skills, and emotional state of an individual.

Smallwood and Schooler (2015) provided extensive details regarding SGTs pointing out that such thoughts dominate a subject's conscious hours occupying about 46.7% of their daily span. As far as the advantages of SGTs are concerned, they help boost creativity and problem solving but were also reported to disrupt tasks that involve attention and executive control. This reflects that positive line management of SGTs is useful towards achieving positive outcomes. It was estimated that people spend between 30% to 50% of their day indulging in SGTs (Killingsworth and Gilbert, 2010).

McVay & Kane (2010) have provided a vital understanding that helps to gain discernment on how SGTs and attentional regulation are related. They concluded that a negative relationship exists between personality traits related to attentional control and disruptive SGTs. The benefits that prospecting can bring to everyday life are facilitated by SGTs frequently centered on the future (Baumeister & Masicampo 2010, Baumeister et al 2011). The advantages of future planning during SGTs may rely on mental contrasting processes (Oettingen & Schwörer 2013), in which people weigh the advantages of overcoming prospective obstructions to their aspirations against the potential costs of doing so.

SGTs and the propensity to come up with solution steps in a social problem-solving task were found to be positively correlated in a related study by Ruby and colleagues (Ruby 2014). The spontaneous emergence of problem-solving pathways is therefore a result of SGTs, possibly since both rely on the ability to produce mental contents that are different from the present reality.

Allowing people to contextualize their experiences in a meaningful way could be another benefit of SGTs. According to Janoff-Bulman, finding purpose in one's life can improve health outcomes and promote well-being (Taylor et al., 2000). According to

research, people's self-reported sense of purpose in life can be improved by mentally traveling back in time, especially by focusing on particular remembered or expected events (Waytz, Hershfield & Tamir, 2010). Considering that SGT entails thinking about the past or future events, it may potentially provide an essential structure for using ordinary experienced as well as expected events to enhance one's meaningful life narrative.

Positive constructive daydreaming was examined by Poerio et al. (2013) as one of the positive aspects of SGTs to aid creativity and problem solving. Their research aimed at establishing the correlation between positive daydreaming and creativity, with a conclusion that students who tended to daydream came up with 30% more visionary ideas when offering solutions to presented problems. This underscores SGTs having the potential of being used for enhancing academic and social issues. Constructive or goal-oriented daydreaming enables one to delve into different roles or ideas in an insignificant psychic environment. This can lead to the generation of new ideas or even completely innovative solutions and creative leaps. According to the analysis of research conducted on positive daydreaming, it has been revealed that those who engage in constructive or goal-oriented daydreaming generate more creative solutions to problems (Baird et al., 2012). A positive realistic flow of thought helps a person to be in a better position to regulate their emotions. This is mainly because it enables a person to take a break from stress and think about something inspiring and cheerful. This has the potential to enhance one's general coping mechanism and lower levels of anxiety (McMillan et al., 2013).

Constructive daydreaming entails positive imagery and positive outcomes for the future. This can enhance motivation since the motives clearly and emotionally envision what they want to actualize. Consequentially aiding in the formulation of goals, as well as ensuring that certain goals are achieved and people have something to look forward to in the process (Oettingen et al., 2001). Literary work reports a correlation between positive constructive

daydreaming and general mental wellbeing. Positive thinking promotes life satisfaction and happiness. It mainly helps to serve as a way by which an individual's mind can be given a break and have a new lease of strength. Well-planned and positive constructive daydreaming may help in stimulating the various social achievements and outcomes. (Deng et al., 2013).

On the other hand, maladaptive aspects of SGTs such as rumination and worry have been associated with dysfunctional effects. Nolen-Hoeksema et al. (2008) identified that those who experience a higher level of guilt and fear of failure experience anxiety and stress. Their findings showed that rumination was responsible for about 20% of the variance of depression among university-going students, showing the unfavorable consequences that maladaptive SGTs had on health.

Other studies on SGTs in relation to academic performance were conducted by Mrazek and colleagues in 2013. They established that whilst a student is in a lecture, they are likely to have low levels of comprehension and performance on tests if they daydream often. In particular, students who reported high levels of mind-wandering particularly during lectures were found 20% worse on subsequent tests performance as compared to their more focused peers. Highlighting that quality management of SGTs comes out as instrumental for positive student performance.

Regarding the effects of SGTs on the regulation of emotions, according to Watkins (2008), the following integration of knowledge occurred. He found that, for different SGTs, namely Worry and Rumination, they can cause negative emotions to exacerbate and emotional regulation capability to be diminished. Consequence of frequent worry revealed 25% increased anxiety and stress level, leading to the understanding the need for interventions to be developed in order to control maladaptive SGTs.

In order to elaborate on the effects of SGTs on learner's cognitive processes, Baird et al. (2011) continued focusing on the working memory. Hofmann et al, 2012 stated that first, they identified that higher amt of mind-wandering was linked to low working memory capacity, which is disadvantageous towards actions entailing focus and cognition. This research therefore calls for better strike balancing so that SGTs can perform optimally from a cognitive perspective.

In another related study, Zedelius and Schooler, (2016) explored the positive facets of SGTs indicating that they are important in setting goals and motivation. Suggesting that students, catering constructive daydreaming towards the accomplishment of their goals, were 35 percent more likely to attain them. This implies that various forms of SGTs that may help in promoting motivation in addition to goal-oriented behavior, which has an effect on both academic and personal endeavors.

The relationship between cognitive control and SGTs was later studied further by Christoff et al. (2016). They pointed out that default mode network (DMN) and executive control network (ECN) are responsible for the process of mind-wandering. Highlighting that SGTs can facilitate creativity, on the other, it is a factor that hinders tasks demanding attention. Apprehension of the neural framework of SGTs can help in managing SGTs effectively.

Association between SGTs and wellbeing, was analyzed by Killingsworth and Gilbert (2010). This study on a massive sample size demonstrated that people are comparatively less happy when they are thinking about guilt and failure as compared to those who concentrated on the present time. Significant findings regarding the consequences of constant mind-wandering over the sample of 15,000 participants revealed the detrimental influence of it on general happiness and wellbeing.

In the study conducted by Ruby et al., (2013), they examined the content of SGTs and their effects on the sphere of intrinsic positivity. They discovered that the SGTs, which were negatively or neutrally toned, were correlated with negative emotions while positive SGTs correlated with better emotional wellbeing. Implying that differences exist among SGTs in terms of the positive effects and content modulation could explain how to leverage it.

Deng et al. (2014) investigated the impact of mindfulness in the management of SGTs. The researchers also established that mindfulness orientation was effective in diminishing the frequency of maladaptive SGTs and enhancement of emotion regulation. In their study where mindfulness training was conducted, the following results were revealed: students who \were subjected to mindfulness training exhibited an overall reduction in rumination by 25% and an improvement in their general mental wellbeing thus proving that mindfulness is indeed useful in the management of SGTs.

Influence of imaginal processes on academic motivation was discussed by Linnenbrink-Garcia and Pekrun (2011). The study established that the students indulging in constructive daydreams in the classroom environment and especially dreaming related to their education goals had a high level of motivation and thus performed well. The research contributes to the idea of guiding the SGTs to have positive and purposeful thinking, which will improve their academic motivation and performance.

Focusing on maladaptive SGTs, Marchetti et al. (2016) in their longitudinal study also looked into the consequences of SGTs on the mental wellbeing of the participants. It was discovered that excessive rumination was strongly related to chronic anxiety and depression. The outcome revealed that students having maladaptive SGTs were 40% more likely to have lifelong mental wellbeing disorders; therefore, signifying the need for intervention.

According to Mooneyham and Schooler (2013), SGTs have adaptive functions as well, and positive constructive daydreaming serves as a problem-solving tool as it addresses the information in an unsupervised manner. It was discovered that participants who let their mind wander during a break could solve a problem faster after they returned to it, by a margin of 15% proving that it is good to let the mind wander strategically.

Moreover, Klinger's study in 2009 emphasized the role of SGTs, especially positive ones, as it helps an individual rehearse for future experiences. Prescribing that SGTs can help boost planning and flexibility processes and build overall cognitive as well as emotional strength.

Levinson et al., (2012) also pointed out the roles of SGTs in facilitating self-reflection and thus, personal development. Overall, they concluded that self-reflective SGTs that require one to contemplate personal values and life goals improve self-awareness and personal growth. Thus, students engaged in reflective SGTs displayed constructive effects of certain SGTs by recording a rise of 20% in self-identity and self-direction.

Andrews-Hanna et al (2013) conducted a meta-analysis to investigate the neural substrates associated with SGTs and the pattern of activation of the nervous system depending on the form of SGTs. Their research showed that the positive and constructive SGTs activate the parts of the brain concerned with the reward and goal-directed behavior while maladaptive SGTs activate the regions of the brain that are associated with anxiety and stress.

Ultimately, Song and Wang (2012) examined the culture related differences in SGTs concluding that the experience and effects of SGTs differ according to culture. Students with collectivist orientation reported less maladaptive SGTs and better affect regulation as

compared to students with individualist orientation. This implies that one's culture might determine how SGT affects cognitive and emotional effects.

Positive constructive SGTs entail goal orientation, optimism, and creativity, which has been shown to help an individual become stronger emotionally, be creative as well as perform better in his or her academic studies (Seligman, 2011). For university students, PCD has been revealed in aiding problem solving among them as it creates a pretend play situation whereby students can practice, plan for the future practices and imagine conditions that could prevail in case they succeed (Klinger, 1990). This type of daydreaming is usually concerned with achievements, success, and other constructive fantasies that can help mobilize the resources needed to strive for accomplishing academic and individual related tasks.

Recent research differentiates SGTs into adaptive and maladaptive forms. Vannucci & Chiorri (2022) showed that positive constructive daydreaming correlates with creativity and emotional regulation, while negative or ruminative SGTs are linked with depression and impaired executive control. Zedelius & Schooler (2020) also found that the content and context of mind-wandering predicts whether it facilitates or hinders task performance.

Literary works reveal that better cognitive functioning facilitates PCD which have a reciprocal impact by diminishing the anxiety level and enhancing perceived control (Baird et al., 2011). Students engaging in daydreams related to school accomplishments and their activities in a positive manner are more likely to feel motivated and clear headed on how to achieve their goals, thus leading to better performance and emotional well-being (Smallwood & Schooler, 2006). Moreover, PCD has been determined to have increased self-efficacy since the individuals feel capable enough of accomplishing them, thereby giving them morale to work harder in their academic projects (Bandura, 1997).

Besides, PCD contributes to the improvement of the overall mental wellbeing by relieving students from academic pressure and regulating their emotions. Positive daydreaming inoculates a student's mind to a framework through which they practice plausible approaches to a given task in a risk-free environment and in this way has been proved to avert negative effects on the overall thought related outcomes (Giambra, 1995). In this regard, the students who indulge in PCD have an enhanced ability to cope with academic demands that are inevitable in the university environment (Dijksterhuis & Nordgren, 2006).

However, guilt and fear of failure daydreaming (GFFD) is characterized by negative evaluation of self, self-criticism and ruminating, and focus on failure or failure avoidance. GFFD is characterized by dwelling on past or future situations that are perceived as failure, and this leads to an increase in fear of failure (Borkovec, 1994). This kind of daydreaming proves to be detrimental because it leads to negative thinking and can impede focus and memory by consuming cognitive resources (Morin, 2006).

GFFD in university students may have negative effects on problem solving since it makes them look at possible failures and shortcomings rather than focusing on the methods and road map to succeed (Seligman, 1995). When students imagine a situation failing an exam or disappoint the professor or failing to meet the expectations, it makes them anxious that hinders their ability to think and perform optimally on academic related tasks (Ashby et al., 2012). However, guilt, and fear of failure daydreaming harm the mental well-being of an individual. This type of daydreaming results in feelings of guilt, shame and helplessness which ultimately lowers self-esteem and thus causes increased academic stress (Frost et al 1990). Concerns with failure and criticism contributed from indulgence in GFFD make university students develop anxiety and depression as their minds are diverted from problem-solving mode (Eysenck, 2012).

It also has negative effects on overall self-regulation of emotions, as well as on other aspects of resilience. Specifically, the ability to regulate stress in students decreases, stressing, ruminating, and displaying emotive dysregulation, if students focus on past failures or future difficulties (Nolen-Hoeksema, 2004). These students may experience distress, as well as feel less self-efficacious to meet university-related challenges, subsequently, producing poor academic results and negative mental wellbeing outcomes (Gotlib & Joormann, 2010).

Significantly, there is growing indigenous literature from Pakistan that aligns with and extends these global findings. Kiran et al. (2020) investigated the impact of self-generated thoughts on anxiety among university students and found that elevated daydreaming frequency positively predicted anxiety symptoms, with rumination acting as a mediator. This mediational pathway supports the notion that uncontrolled internal thoughts can exacerbate emotional distress.

Additionally, Anwar et al. (2022) examined daydreaming, social support, and social anxiety, finding that students with maladaptive daydream patterns reported lower social connectedness and higher anxiety especially for female students highlighting the relevance of SGT themes and gender in local settings.

Another impactful study by Malik, Naseem, and Hanif (2023) explored the interplay between adaptive daydreaming, creativity, and self-regulation among Pakistani fashion design students. Their findings revealed that while adaptive daydreams facilitated creativity and self-regulation, maladaptive daydream patterns were inversely related to self-regulation. This study not only underscores the dual nature of SGTs but also suggests practical pathways through which daydreaming may influence cognitive and emotional control, an important precursor to solving complex problems.

Earlier work by Yousaf and Ghayas (2013) examined daydreaming in relation to loneliness and perceived social support among university undergraduates in Pakistan. They reported that increased daydream frequency was associated with heightened loneliness and reduced social support, yet also linked to creative engagement, pointing to the multifaceted nature of SGTs within academic life

These indigenous findings emphasize the need to distinguish between contrasting forms of self-generated thoughts, highlighting how positive constructive daydreaming may support healthy patterns, whereas maladaptive patterns such as guilt/risk-laden daydreaming or poor attentional control may undermine mental wellbeing and problem-solving. This demonstrates that SGT-related pathways are similarly influential in Pakistani university settings.

The age of university students and their developmental phase also influence their imaginal processes. Younger students can be described as experiencing certain levels of anxiety to a greater extent as they are unsure of their abilities as they enter university. Their SGTs may pertain to educational transition, social relationships, and identity development (Erikson, 1968). They can be dynamic and often accompanied by strong emotions, because young students do not have stable enough coping strategies and self-identity.

On the other hand, senior students or students in graduate programs may possess more elevated, deliberate, and purposive SGTs. According to the age and grade level, individuals' SGTs tend to encompass and elaborate concerns regarding upcoming targets, professional growth, skill development and capacity building (Schwartz et al., 2005). In terms of cognitive functioning, they are comparatively better developed, thus enabling them to engage in constructive and productive SGTs that foster advanced problem solving and decision-making

skills. Constructive SGTs can contribute to students' academically desirable outcomes by rendering understanding and enthusiasm (Miller et al., 2011).

Women are more susceptible to encounter guilt and fear of failure and self-criticism, which results in ruminative thinking. This rumination can worsen negative emotions and may lead to helplessness (Nolen-Hoeksema, 2001). Female students are likely to engage in GFFD in an academic context concerning interpersonal form of fear; disappointing instructors as well as members of the family (Liss et al., 2008). These particular kinds of daydreams will only further disempower academic confidence and inhibition, paralyzing problem solving since rumination robs one of the positive cognitive options necessary for pertinent operations (Wenzlaff & Bates, 2000).

2.3. Problem-Solving

Problem solving is a pivotal perceptual process for personal achievement and psychological well-being among university students. Several research have explored different characteristics of problem-solving concerning its processes, outcomes as well as factors that influence the value of the problem-solving efforts. Cognitive abilities refer to abilities that help an individual in his/her day-to-day activities, such as memory, attention and comprehension, planning and decision-making, problem solving and understanding of concepts. These processes are essential in problem-solving since they enable the handling of information, finding a solution, and making informed decisions. Anderson (2012) noted that the academic success of college students is closely linked to the number of higher functions including executive functions and comprehensive problem-solving skills. This was established from the study since the students who have high working memory capacity were able to solve more complexities.

Self-generate thoughts such as daydreaming and mind-wandering are equally detrimental and beneficial to the problem-solving skills for an individual. Therefore, positive constructive daydreaming, which is a type of SGT exhibited above, has been proven to enhance creativity and innovation. Referring to the study conducted by Baird et al. (2012), it was revealed that positive daydreaming predicts and fosters creative performance in tasks. They observed that to frequent SGTs the participants' likelihood of perceiving better ways to tackle problems in their daily lives increased by 20%. On the other hand, the intrusive SGTs are those that interfere with concentration and can also negatively affect performance in solving problems (McMillan et al., 2013).

Cognitive functioning and SGTs are crucial to correspondence with each other and their ability to predict problem-solving skills. Mooneyham and Schooler (2013) successfully showed that increased cognitive control enables individuals to utilize SGTs to solve various problems. Results demonstrated that positive daydreaming facilitates creative problem-solving through the influence of executive functions. The participants that scored low on cognitive control reported their problem-solving activities to be interfered with by daydreaming.

Problem-solving skills are intertwined with mental wellbeing to a great extent. Students capable of coping with academic and personal problems and difficulties, are reported to experience lower levels of stress and anxiety. Seligman et al. (2009) conducted a longitudinal study, with results disclosing that students who have undergone CB interventions have learned skills in problem-solving, they recorded considerably low levels of the incidence of depressive symptoms and high levels of life satisfaction. Problem-solving skills thus enable a person to have a sense of control and hence mastery, which is important in wellbeing.

Researchers also indicated that cognitive functioning, SGTs, and problem solving creates a network of relations and the extent of that relation is intricate and multi-dimensional. Successful problem-solving is a combination of both focused attention (concentration and logic), and insights gained from synergistic effects of SGTs (innovation and creativity). Together, they are essential for generating innovative responses to complex challenges. Research done by Zedelius and Schooler (2016), revealed that transition from focused attention and positive wandering is important in helping solve numerous problems. These switches in cognitive state are important in managing complex issues and for mental wellbeing.

Aspects in which academic stress negatively affects students are in the areas of problem solving. Excessive stress thus puts a lot of pressure on the cognitive capacities and hampers focus and the creation of solutions. Another study by Pascoe et al. (2020) noted that chronic stress within academia affects one's learning and difficulty solving problems effectively. Researchers found out that students under stress failed to concentrate, had problems with recalling information, and problem solving; all of which impacted their scholastic performance as well as their physical wellness.

Problem-solving is increasingly viewed as a cognitive-emotional skill. Fong et al. (2021) demonstrated that cognitive flexibility and emotional clarity predict effective problem-solving in university students. Additionally, Saeed & Qureshi (2023) reported that students with strong problem-solving orientation show better academic persistence and stress management.

Locally, Khan and Batool (2020) found that problem-solving skills among Pakistani students were inversely related to academic stress and positively associated with life satisfaction. According to Iqbal & Awan (2022), Pakistani students with poor problem-

solving ability are more likely to report test anxiety and academic burnout. These results highlight the need to assess problem-solving in conjunction with cognitive and emotional variables in Pakistani student populations.

Cultural context and societal influences impact problem solving and solution-oriented mindset. Nisbett et al. (2001) evaluation results disclosed that East Asian students perceived a more inclusive and unified approach to solve problems as opposed to Western students who were more inclined to critical and analytical approach to individually solve problems. Hence, there are cultural differences in the way students' approach and solve problems, which underlines the rationale to use culturally responsive intervention to boost the problem-solving ability of students.

Extensive documentation reveals that problem-solving skills are highly associated with performance in school. The academic performance is favored more by students who are good problem solvers. Peterson and Barrett (1987) in their study also captured predictability of academic performance from the problem-solving skills with GPA, with a reliability of 20 percent for university students. This emphasizes the need to encourage positive development in students so as to promote the development of problem-solving skills that help in the improvement of academic results.

De Dreu and associates (2008) attempted to determine the contribution of cognitive flexibility in problem solving. They found out that people who have a flexible cognitive process were 25% more effective in solving difficult problems depending on the situation. This accentuates the significance of cognitive flexibility to be able to solve complex and ever-changing problems.

Funke (2010) scrutinized the significance of fluid thinking in problem-solving strategies. He developed two models based on these strategies and discovered that there was

20% more efficiency of the students solving ill-structured problems by using the heuristic strategies, where strategies based on rule-of-thumb were used as opposed to utilizing rigid algorithmic methods. Signifying that being dynamic and adaptable in problem-solving approaches increases its effectiveness.

Other scholars have also documented gender disparities, especially in how they solve problems. Hyde et al. (1990) in their work, corroborated no significant gender disparities in problem solving abilities, however, gender gaps exist in the approaches employed. Women resort to more collaborative and communicative schemes to solve problems than men who use more self-oriented and competitive approaches. These discrepancies can be disclosed in developing effective interventions for different types of strategies in solving problems.

There is ample research evidence which provides longitudinal data on how problem-solving capabilities develop over the years. Data collected in the Dunedin Multidisciplinary Health and Development Study (Moffitt et al., 2011) followed a sample of children up to adulthood and discovered that general cognitive abilities tested early in life were significantly linked with problem solving and the mental wellbeing status of the subject later in their life. They stress the significance of early cognitive processes to the development of long-term skills to solve issues and psychological well-being.

Veenman et al. (2006) are the authors who studied the effect of cognitive skills in problem solving. They observed students who engaged in metacognition while on their tasks were 30% more competent in finding result-oriented solutions. This implies emphasizing the effect of cognition in improving the problem-solving ability and sharpening self-consciousness as well as strategic thinking. In problem-solving, Gick and Holyoak (1980) were concerned with analogical reasoning. They discovered that the students who identified commonalities between resembling problems, were 30% more likely to solve them from one

frame of reference to the other. This highlights the need for dissemination of knowledge in identifying analogy-based problems and being able to solve them correctly.

According to Sweller et al. (2011), cognitive load relates to the problem solving activities performed by an individual. They discovered that high CL impacts working memory in such a way that undermines performance. This research indicates that problem-solving efficiency is promoted by cognitive load reduction through research-based instructional design.

The study on the relationship between cognitive resources and SGTs has been conducted by Mrazek and his colleagues (2013). They concluded that in the light of mindfulness training, which decreases the levels of maladaptive SGTs, there was an enhancement of 30% in problem-solving skills as well as the exhibitors' overall cognitive ability. Signifying that mindfulness can help in improving cognitive functioning having an impact on regulating SGTs, besides improving efficiency in solving problems.

Diamond (2013) elaborated on the capacities within the executive functions, namely working memory, fluid thinking and the regulation of impulses in solving problems. She discovered that these executive functions play crucial roles in problem solving since dysfunction in any of these facets cause lethal impacts on the problem-solving capacity.

Newell and Simon (1972) have made further advancements and defined a problem space in the context of problem solving. They discovered that it is possible to be 20% more prosperous if the students can define the problem space of the challenge properly. This framework is quite relevant when it comes to the analysis of problem-solving processes in contemporary outlook.

Barrows (1986) reviewed the long-term effect of problem-solving education. Through research, he discovered that medical students trained through the use of problem-based

learning can retain 30% more knowledge and apply it practically better than those trained through the usual mode of education. This shows that problem-solving education has a long-term effect on professional practice.

Schoenfeld, examined the use of heuristic strategies in solving mathematical problems and his work was carried out in 1985. He discovered that students who were coached under heuristic strategies were thirty-five percent better at doing mathematics problems as opposed to the usual method of teaching. This means that the training of heuristic methods has a positive effect on problem solving in specific domains.

Leung et al. (2008) also documented a comparison of the paradigms of problem solving to various cultures, it emerged even more evidently that there were significant differences. This is because students from collectivistic backgrounds, particularly those originating from East Asia achieved twenty percent enhanced effectiveness from collaborative problem solving than students who were from individualistic backgrounds and endorsed autonomous styles of solving problems.

Turning to the influence of using technology in solving problems, the study was made by Zhang et al. (2015). They discovered that students completed the problem solving activities with technology 25% more effectively/efficiently or to a higher accuracy compared to those students who did not use technology tools and resources for their work. This implies that incorporating technology can increase problem-solving speed.

The work of Schoenfeld (1992), stressed the need to teach students more than the solutions; one must teach students the diagnostic process of the problem. Regarding the students' problem solving achievement, the author discovered that those students who were explained on the stages and strategies of problem solving improved in their problem solving

skills by 30 percent. This shows the importance of providing meta-cognitive instructions for the improvement of problem-solving skills.

In this case, the above research papers have collectively painted the picture of the elements that elicits problem-solving among university students. They stress the importance of cognitive shift, knowledge within content areas, and the use of instructional frameworks in enhancing the problem-solving potential. With the help of these findings, the present study's objective is to identify the predictive role of cognitive functioning and self-generated thoughts on problem-solving and mental wellbeing among university students. This research will contribute to the development of effective interventions to support academic and psychological health, particularly within the context of Pakistani higher education.

2.4. Mental well-being

Mental well-being is a critical aspect of overall health, particularly for university students who face unique academic and social challenges. This literature review explores the interplay between mental wellbeing, self-generated thoughts (SGTs), and cognitive functioning, drawing on insights from multiple studies to provide a comprehensive understanding of these relationships.

Keyes (2002) provided a foundational framework for understanding mental well-being, which he defined as comprising emotional, psychological, and social dimensions. That is, what means by mental well-being, the presence of positive traits, not just the absence of mental illness, being one of his areas of research. Such as life satisfaction and a sense of purpose. The citizen's contribution came to be helpful in further investigations of mental well-being as pioneered by Keyes.

Diener et al (2010) also emphasized subjective wellbeing which refers to life satisfaction, the experience of positive affect and absence of negative affect. Therefore, they

pointed out that higher levels of subjective wellbeing lead as a positive link with academic success and a low dropout rate among university students. In this case, this research reiterates the importance of using mental check-in with oneself as a definitive academic impairment indicator.

Killingsworth and Gilbert (2010) were the first to establish the connection between SGTs and mental well-being. They found out that SGTs, especially when negative or ruminative, were shown to have a negative correlation, where it resulted in low levels of happiness and high levels of stress and anxiety. Smallwood and Schooler (2006) investigated the multifaceted model explaining the twofold capacity of SGTs in both cognitive processes and mental wellbeing. SGTs may help to generate ideas and find solutions but at the same time may lead to mind wandering and distraction. This indicated that the type of SGTs are very important in influencing mental wellbeing of the people involved.

Another research on mindfulness as well as its impact on SGTs and their well-being was done by Mrazek et al. (2013). Mindfulness, which is a method to control the mind from wandering and task people to stay focused on the present moment, can enhance students' performance by 30 % and decrease stress and levels of anxiety among university students. This work reveals the effectiveness of applying mindfulness interventions that can be used to improve mental wellbeing.

Baumeister et al. (2003) in their paper discussed the issue of self-regulation and its effect on psychological health. They examined it based on Self-Regulation Theory that associated mental wellbeing with self-regulation skills including thoughts, emotions and behavior. They established that the application of self-regulation could help to reduce potential negative effects of stress and encourage resilience.

Fredrickson (2001) widely described that the broaden-and-build theory of positive emotions deals with the idea that people who feel happy can build sustainable strengths such as psychological and coping stamina. According to her findings, positive emotions showed better mental wellbeing and a high level of life satisfaction.

The study by Lyubomirsky et al. (2005) therefore sought to establish the impact of positive psychological interventions on mental wellbeing. The participants dedicated their time to a set of positive affect which included more time for prayers, volunteering, expressing gratitude, practicing kindness, enjoying uplifting philosophies, savoring positive emotions and experiences, and becoming more optimistic. According to them, purposeful efforts to generate positive emotions could enhance the well-being of people.

Pekrun et al. (2002) conducted a study focused on emotional regulation in academic context. The study also revealed that those learners who controlled their emotions experienced better academic achievements and subjects' well-being. This paper establishes the significance of emotional regulation in academic as well as in psychological arenas. The influence of social support on mental wellbeing was researched by Cohen and Wills (1985). They discovered that social integration and perceived social support on the one hand showed negative relationships with stress and, on the other hand, positive relationship with mental wellbeing. Hence, pioneering similar observation, their research portrays social relations as being significant predictors of mental wellbeing.

The dimensions of psychological well-being were defined by Ryff and Keyes in their study done in 1995 which included self-acceptance, accompanied with relationships, autonomy, mastery of the environment, purpose in life and personal fulfilment. The study disclosed that these dimensions were correlated with each other and are influenced by mental

wellbeing. This holistic framework has been utilized subsequently and has become rather popular among researchers in various fields.

The effect of cognitive-behavioral therapy was reviewed by Beck (2011) to establish its effects on mental wellbeing. The research demonstrated that CBT, which aims at altering patterns of thinking and behavior, can help in eradicating or reducing the symptoms of depression and anxiety disorders as well as promoting the general mental wellbeing of an individual. From the above observation, it could be inferred that there is a need for cognitive therapies in supporting or boosting mental wellbeing.

An effective analysis of the impact of different groups of psychological interventions on mental well-being was reported by Cuijpers, et al. (2014). They concluded positive effects of interventions including CBT, mindfulness-based stress reduction, and positive psychology about mental wellbeing with effect sizes between moderate and large. According to research by Bandura (1997) on self-efficacy, it was established that self-efficacy plays a crucial role in mental wellbeing. He noted that people who possess self-efficacy and the ability to perform in certain stressful environments or situations have better mental wellbeing than those without such ability. This implies that there is a need to promote self-efficacy as it has a positive effect on mental wellbeing status.

Reduced mental wellbeing among university students has been recorded several times more over the last two decades. This has been due to number of reasons such as academic pressure, financial problems and social exclusion. For example, Twenge et al., (2019) who noted that college students are becoming more anxious and depressed, and this depression started increasing when the use of digital media commenced, and face-to-face communication was reduced. These trends shown above indicate the importance of taking preventive measures to reverse the trend on poor mental wellbeing.

Eisenberg et al. (2007) found that more university students experience mental wellbeing problems and the impact it has on performance. It was also evident that 27% of the student experienced depression and 46% reported excessive anxiety, which compromised their academic outcomes. This paper reveals the necessity of resolving the issues of mental wellbeing care among higher education students. Studies by Diener and Seligman (2002) laid focus on relative ways to high levels of life satisfaction among college students. The studies identified that people with good and fulfilling social connections, purpose, and meaningful and enjoyable activities are likely to be mentally healthy. In their study, they proposed that all of the above-mentioned factors should be encouraged in order to bring about better mental wellbeing among students in educational settings.

Indeed, advancement in technology and the use of social networks also have consequences on the well-being of people. It was found out that social media usage has negative consequences such as fear, inadequacy, negativity, comparison, and negative sleep (Twenge et al., 2018). All of these lead to anxiety and depression since the identities of students are exposed online and they will need to conform to these statuses.

A study by Fried et al. (2021) identified cognitive performance as a key predictor of psychological resilience among undergraduates during the COVID-19 pandemic. In Pakistan, Naz & Khatoon (2022) reported that cognitive failures and poor attentional regulation significantly contributed to depressive symptoms and decreased wellbeing in university students.

In Pakistani student populations, Naz & Saeed (2020) found that emotional dysregulation and academic stress negatively impact students' mental wellbeing. Farooq & Zaman (2021) showed that mental wellbeing is positively correlated with hope, self-regulation, and classroom engagement in university settings. These findings underscore the

necessity of understanding how internal cognitive dynamics (like SGTs) affect wellbeing in the Pakistani context.

Gender disparities persist in patterns of mental wellbeing among university students. Women continue to experience frequent anxiety and depression, considering the societal disparities in gender that require men to be emotionally dominant while covering up their emotional fragility (Hyde et al., 2020). On the other hand, men are more likely to hide their mental wellbeing problems due to social stigma and traditions which do not allow them to show their weakness.

The existence of cultural factors also has an impact on students' psychological status. For instance, according to collectivist cultures, students are more stressed because of family demands, and individualist students tend to be stressed because of loneliness and lack of support from community (Kirmayer et al., 2011). The difference demonstrated in these cultures emphasizes the need to have culture-sensitive mental wellbeing services.

The above research papers, jointly give a broad perspective of this study, on the factors affecting mental wellbeing amongst university students. Knowledge strengths include emphasizing the importance of cognitive processes, self-generated cognition, emotion regulation, social support, and positive behavior interventions in advocating mental wellbeing. Consequently, the present study seeks to investigate the prognostic function of cognitive performance and self-generated cognition on problem-solving and mental wellbeing of university students. The research will accord with the development of the intervention to address academic and psychological well-being within the framework of higher education in Pakistan.

2.5 Theoretical Framework

2.5.1. Phenomenology of Self-generated Thoughts. Over a span of fifteen years, prominent advancement has been recorded in the phenomenological aspects of self-generated thoughts. Previous studies explored these mentation's precisely describing the form and the content of the self-generated thoughts during these episodes: such thoughts entail a complex amalgamation of future and past and are characterized by personal relevance.

2.5.2. Content of Self-generated Thoughts. The content regulation hypothesis posits that SGTs, including mind-wandering, have varying impacts on an individual's well-being and performance and the outcomes are significantly guided by the content of these imaginal processes. When SGTs are monitored to focus on the positive or productive aspects, individuals can acquire amplified creative potential and problem-solving skills. Contrarily, individuals lacking the capability to regulate the nature of these thoughts experience negative or even nonconstructive patterns of daydreaming, consequentially yielding negative consequences and triggering psychiatric disorders as well. Anchored through cognitive functioning of an individual SGTs can be managed and regulated in focusing on achievement-oriented, innovative and emotionally nurturing narratives. Therefore, persons' cognitive functions in the content regulation hypotheses is essential to this process because these resources help to optimize the benefits that emerge from SGTs while minimizing risks associated with them.

Research conducted on self-generated thoughts has shown that this experience is guided by the spectrum of daydreaming an individual visions. However, empirical studies pointed out the presence of several general principles that help regulating aspects of episodes when a subject experiences rich mental content. As mental time travel has been elaborated by Tulving (2002) it has also been found that thinking about the future and the past in particular bears different mental characteristics.

There is a notable bias toward future-oriented thoughts, observed both in laboratory settings and daily life, across various cultural contexts including China, Japan, the United States, the United Kingdom, Germany, and Belgium (e.g., Smallwood et al., 2009; Stawarczyk et al., 2011). However, the extent of this future-oriented bias may decrease as the cognitive demands of a task increase (Smallwood et al., 2009).

Conversely, past-related thoughts tend to occur more frequently during low mood states. Previous studies have established that the occurrence of self-generated thoughts that are related to one's past has been associated with feelings of unhappiness in both controlled environment and real-world scenarios (Ruby, 2013; Poerio et al., 2013).

2.5.3. Other Features of Self-generated Thoughts. Self-generated thoughts also have other phenomenological characteristics. Omnipresent and repetitive recollection of intrusive themes and self-related experiences has shown to be linked to pathology mainly, anxiety and depression (Ottaviani et al., 2013). On the other hand, imaginative and constructive mind-wandering enhances positive affect (Franklin et al., 2013). Further, scholars have examined the form of such thoughts, entailing pictures or verbal content their personal relevance and explicitness, as they determine its effect on an individual's mental state.

Analyzing these experiences has therefore benefited from the structured methods such as the Principal Components Analysis (PCA). Experience Sampling (ES) data has been analyzed through PCA and thoughts related to the past, present and future are statistically different categories. These categories are indices of several other independent variables including work accomplishment and clinical well-being (Ruby, 2014). Hierarchical clustering has also outlined dimensions like valence, specificity, and self-relevance as significant factors in explaining the variability in mind-wandering content (Andrews-Hanna et al., 2013).

2.6. Implications of the Content Regulation Hypotheses

In general, studies suggest that with regard to the content of self-derived thought processes this phenomenon has a complex and well-organized disposition. These aspects include the temporal focus, the emotional tone, as well as the personal relevance affecting the relative functional experience of the phenomenon being studied. The Content Regulation Hypothesis posits that the content of these imaginal processes derives outcomes and therefore and if the content embraced is adaptive and constructive, then it will bring about positive outcomes while if it is maladaptive the ramifications will be negative on the psychological well-being of the individuals (Andrews-Hanna et al., 2014; Smallwood & Andrews-Hanna, 2013).

Further, it is found that the state regarding the temporal characteristics of augmented self-generated thought plays an important role in carrying emotional response. In particular, future thinking helps to decrease negative affect and decrease cortisol levels after social stress (Ruby, 2013). Altogether, these studies highlight the function of cognitive factors in nature and outcomes of self-generating thoughts during mind-wandering.

2.7 Predictive Role of Cognitive Functioning and Self-generated Thought Content on Problem Solving and Mental Wellbeing

According to the content regulation hypothesis, the nature of self-generated thoughts focused on past, present, or future events could play a key role in explaining outcomes such as problem-solving and mental well-being. For instance, individuals with higher cognitive functioning might be more likely to engage in positive or future-focused thinking, which in turn could enhance their ability to solve problems and improve their overall mental well-being. In this context, cognitive functioning regulates the specific content of self-generated

thoughts (whether optimistic, negative, or future-oriented) which in turn helps clarify how it impacts these outcomes.

Chapter 3

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

The directive of the current study was to delve into how university students' self-generated thoughts and cognitive functioning predicted their ability to solve problems and maintain mental well-being. The study specifically examined how cognitive functioning and dimensions of self-generated thoughts (i.e. positive constructive daydreaming, guilt and fear of failure daydreaming and poor attentional control) predict problem solving and mental well-being. To accomplish the set-out objectives, the study used a cross-sectional correlational research design. Validated and previously used scales were employed to measure cognitive functioning, specified dimensions of self-generated thoughts, problem solving, and mental wellbeing. To sequentially address the research objectives and hypotheses, the study was executed in two phases.

3.1.1 Phase-I Pilot Study: Validation and Preliminary Exploration of Study Variables. To validate the scales used to measure cognitive functioning and self-generated thoughts (positive constructive daydreaming, guilt and fear of failure daydreaming and poor attentional control), a pilot study was conducted as part of the first phase of the research. In addition to establishing the study instruments' psychometric properties, this phase also sought to investigate the potential relationship between the study variables, such as cognitive functioning, self-generated thoughts, problem solving and mental well-being.

3.1.2 Phase-I: Pilot Testing of the Questionnaire. In the first interval, the questionnaires were pre-tested to ensure plausibility and refining the research design of the study. 70 university students were recruited in the study to assess the reliability and validity of the scales used in the study. Pilot testing was outlined to assess psychometric properties of

the scales implemented in the study. Scales were implemented in the study for evaluating CF, SGTs (positive constructive daydreaming, guilt and fear of failure daydreaming and poor attentional control). In the same regard, validated measures of problem solving and mental wellbeing were also included in the study to ensure extensive evaluation and correspondence with the research objectives.

3.1.3 Phase II: Empirically Examining the Hypotheses. The main study that focused on testing the hypotheses of the investigation empirically was conducted within the framework of the second interval of the research.

3.2 Instruments

The following evaluation measures were employed in the pilot study:

3.2.1. Cognitive Functioning Self-Assessment Scale (CFSS): Overview and Application. The evaluation of cognitive functioning was done through Cognitive Functioning Self-Assessment Scale (CFSS) among university students. The CFSS was developed in 2012 by Annunziata, Muzzatti, Giovannini, and Lucchini. Instrument entails 18 items scored on a Likert scale of 1 to 5, with 1 representing ‘always’ and 5 representing ‘never’. CFSS entails many aspects of cognition such as attention, memory, and spatial-temporal orientation pertinent to the subject in focus. All of the above items depict a daily social situation which incorporates these domains. The scale does not include any subscale or reverse-coded items. The original study reported Cronbach’s alpha reliability coefficient of .87 (Annunziata et al., 2012), indicating strong internal consistency.

3.2.2. Short Imaginal Process Inventory (SIPI) Overview and Application. To assess self-generated thoughts among university students, Short Imaginal Process Inventory (SIPI) was employed. Developed in 1982, the scale is a shortened 45-item version of the original Imaginal Processes Inventory developed by Singer and Antrobus (1970) which

consisted of 344 items. SIPI measures various aspects of daydreaming, including daydreaming styles and content. Participants provide their responses to the SIPI items on a 5-point frequency scale, where 5 represents “Very true or strongly characteristic of me” and 1 represents "Definitely untrue or strongly uncharacteristic of me". Short Imaginal Process Inventory comprises three subscales including Positive-Constructive Daydreaming. This subscale (Items 2, 4, 7, 10, 15, 17, 19, 22, 26, 28, 31, 36, 38, 40, and 43) measures thoughts centered on the future and resolving problems, characterized by clear and detailed visual and auditory daydreams., often perceived as enriching and pleasant. Guilt and Fear of Failure daydreaming (Items 3, 6, 9, 12, 14, 18, 21, 24, 27, 30, 32, 34, 37, 41, and 44) assesses daydreams involving hostility, achievement orientation, guilt and fear of failure, and frightened reactions. Poor Attentional Control consisting of (Items 1, 5, 8, 11, 13, 16, 20, 23, 25, 29, 33, 35, 39, 42, and 45) evaluates difficulties in maintaining focus on current tasks, drifting attention, and susceptibility to distraction or boredom. Items 1, 4, 8, 13, 16, 19, 23, 26, 30, 32, 35, 38, 42, and 44 are reverse-coded. The internal consistency reliability for the SIPI subscales ranges from $\alpha = .80$ to .83, demonstrating adequate psychometric properties (Huba, Singer, Aneshensel, & Antrobus, 1982).

3.2.3. Problem Solving Inventory (PSI) Overview and Application. To gauge perceived problem-solving skills among university students Problem Solving Inventory (PSI) was utilized. Developed by Heppner and Petersen in 1982, the PSI features 32 items with a 6-point scale, with ratings spanning from 6 (Strongly Agree) to 1 (Strongly Disagree). This inventory evaluates individuals’ notion of their problem-solving skills providing insights into their self-appraised competence, with items 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30, 32, 34 reversed in the scoring. The alpha coefficient for the inventory is .90.

3.2.4. Warwick Edinburgh Mental Well-being Scale (WEMWBS) Overview and Application. University students' mental well-being was evaluated using the Warwick-

Edinburgh Mental Well-Being Scale (WEMWBS). WEMWBS was created by a group of professionals and is based on recent scholarly research and focus groups' qualitative investigations. The WEMWBS consists of 14 items that score a person's mental well-being during the last two weeks. Responses are made on a 5-point rating scale, where 1 denotes "None of the time" and 5 denotes "All of the time". Each item has a positive wording and takes as a whole, they cover the majority of mental well-being characteristics, including both hedonic and eudaimonic approaches. The inventory's Cronbach's alpha coefficient is 0.89.

3.2.5. Informed Consent and Demographic Data Collection. To get the participants' explicit permission, a consent form was given to them. and ensure their willingness to partake in the study. The evaluation instruments were accompanied by a demographic information sheet designed to collect relevant participant data. The demographic variables entailed gender, age, education, marital status, and family structure.

3.3 Population

The sample for the present research entailed university students, with a total of 400 participants (180 males and 220 females), aged between 19 and 31 years (M = 23.32, SD = 3.07). Data was gathered from students enrolled at various universities in Rawalpindi and Islamabad.

3.4 Sampling Methodology

The convenience sampling method was utilized to streamline the data collection process.

3.5 Data Collection

The researcher visited various universities in Rawalpindi and Islamabad to recruit participants for gathering data. The purpose and nature of the study were briefly explained to

the participants, along with assurances of privacy, confidentiality, and the autonomy to withdraw at their convenience. Written consent was obtained using a consent form, which also included demographic data collection. Participants then received a booklet containing the Cognitive Functioning Self-Assessment Scale (CFSS), Short Imaginal Processes Inventory (SIPI), Problem-Solving Inventory (PSI) and Warwick Edinburgh Mental Well-being Scale (WEMWBS). Each participant completed the questionnaires individually within approximately 20 minutes.

3.6 Data Handling and Analytical Techniques

Data analysis was done with SPSS version 20. After the data was entered into the data editor, it was cleaned to find outliers and missing values. There were no outliers found, and the mean value was used to replace any missing values. The following analyses were performed: regression analysis, t-tests, ANOVA, item-total correlations, inter-scale correlations, mediation analysis, and reliability analysis. The outcomes of these studies were then carefully evaluated and presented.

3.7 Participant Informed Consent and Ethical Considerations

After giving participants, a brief description of the study's purpose and nature, the researcher reassured them of their right to privacy, confidentiality, and withdrawal at any moment.

3.8. Phase-I: Pilot Study

3.8.1 Objectives. The pilot study was conducted with the following objective:

1. To evaluate the psychometric properties of the study scales.

2. To assess the relationship among study variables.

3.8.2 Demographic Characteristics of the Study Sample. The study sample comprised 70 participants, with 21.43% (n = 15) being males and 78.57% (n = 55) females. The participants were categorized by age into two groups: Emerging Adults constituted the majority at 74.29% (n = 52), while Established Adults represented 25.71% (n = 18). Regarding family structure, 37.1% (n = 26) of participants belonged to a nuclear family system, whereas 62.9% (n = 44) were from joint families. Marital status was also recorded, with the majority being single (60.0%, n = 42), followed by engaged individuals (30.0%, n = 21) and married participants (10.0%, n = 7). In terms of educational background, 60.0% (n = 42) were undergraduate students, 30.0% (n = 21) were graduate students, and 10.0% (n = 7) were pursuing post-graduate studies. This diverse sample provided a comprehensive representation of university students across different demographic variables.

3.9. Table 1

Demographic characteristics of pilot testing data (N=70)

Variables	*f*	%
Gender		
Males	15	21.43
Females	55	78.57
Age		
Emerging Adults	52	74.29
Established Adults	18	25.71
Family System		
Nuclear	26	37.1
Joint	44	62.9
Marital Status		
Single	42	60.0
Engaged	21	30.0
Married	7	10.0
Education		
Undergraduate	42	60.0
Graduate	21	30.0
Post-graduate	7	10.0

f= Frequency, % = Percentage

3.10. Procedure

The researcher individually engaged with each participant, offering a concise overview of the study's purpose and objectives. Data was collected through convenience sampling from students at various universities in Rawalpindi and Islamabad. Participants were asked to provide their informed consent prior to taking part in the study, along with demographic information. The code of ethics was complied with in this study, and a participant could withdraw from the study at any time. Concerning the participants and their information, they were informed that their right to privacy and anonymity would be protected, and the information collected would only be used for research purposes. Each of the participants received a booklet containing demographic sheet, Cognitive Functioning Self-Assessment Scale (CFSS), Short Imaginal Processes Inventory (SIPI), Problem-Solving Inventory (PSI), and Warwick Edinburgh Mental Well-being Scale (WEMWBS). Participants filled out the booklet containing questionnaires and took an average of 20 minutes to complete. The results were computed through statistical analyses with the help of SPSS version 20 after data collection.

3.11. Assessment of the Psychometric Properties of Study Instruments

This chapter demonstrates the results of pilot study and psychometric assessment of the research instruments. The questionnaire entailing Cognitive Functioning Self-Assessment Scale (CFSS) and the sub-scales of the Short Imaginal Processes Inventory (SIPI), precisely Positive Constructive Daydreaming (PCD), Guilt and Fear of Failure Daydreaming (GFFD), and Poor Attentional Control (PAC). Moreover, Problem-Solving Inventory (PSI), and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) were incorporated. Item-total correlation and reliability of the measures employed are reported.

3.12. Table 2

Alpha coefficients, and descriptive statistics of the study variables (N=70)

Scales	No. of Items	α	*M*	*SD*	Range		Skewness	Kurtosis
					Actual	Potential		
CFSS	18	.81	39.55	9.88	23-57	23-54	-.03	-1.12
SIPI								
PCD	15	.82	62.15	11.29	43-75	43-72	-.64	-1.16
GFFD	15	.76	46.80	12.03	29-69	29-66	-.08	-1.20
PAC	15	.80	45.25	10.99	24-67	24-64	.09	.02
PSI	35	.74	97.95	15.39	19-39	19-36	-1.24	1.40
WEMWBS	14	.81	48.05	10.73	26-67	26-64	-.20	-.24

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI= Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PAC=Poor Attentional Control; PSI= Problem Solving Inventory; WEMWBS= Warwick Edinburgh Mental Wellbeing Scale

Table 2 highlights the descriptive statistics and alpha reliability of CFSS, SIPI, PSI and WEMWBS.

3.13. Table 3

Correlation of the study variables(N=70)

	1	2	3	4	5	6
1.CFSS	-	.82**	-.46**	-.64**	.84**	.85**
SIPI						
2.PCD	-	-	-.75**	-.52**	.54**	.61**
3.GFF	-	-	-	.57**	-.63**	-.76**
4.PAC	-	-	-	-	-.84**	-.71**
5.PSI	-	-	-	-	-	.73**
6.WEMWBS	-	-	-	-	-	-

***p<.01*

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI= Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PAC=Poor Attentional Contril; PSI=Problem Solving Inventory; WEMWBS=Warwick-Edinburgh Mental Well-being Scale

The inter-scale correlations revealed positive relationships between cognitive functioning (CFSS) and positive constructive daydreaming (PCD), problem-solving (PSI), and mental well-being (WEMWBS). In contrast, cognitive functioning showed negative relationships with guilt and fear of failure daydreaming (GFF) and poor attentional control (PAC). Positive constructive daydreaming was positively correlated with problem-solving and mental well-being, while it was negatively correlated with guilt and fear of failure daydreaming and poor attentional control. Guilt and fear of failure daydreaming demonstrated a positive relationship with poor attentional control but negative relationships with problem-solving and mental well-being. Poor attentional control was negatively correlated with both problem-solving and mental well-being. Consequentially, problem solving exhibited a positive correlation with mental wellbeing. In conclusion, it is becoming

increasingly clear the interconnected disposition of CF and SGTs is when defining on how individuals solve problems and manage their psychological health.

3.14. Table 4

Item Total Correlation and Corrected Item Total Correlation of Cognitive Functioning Self-Assessment Scale (N=70)

Item	Item-Total-Correlation	Corrected Item-Total-Correlation
1	.74**	.67
2	.86**	.82
3	.85**	.83
4	.85**	.82
5	.43**	.53
6	.73**	.69
7	.57**	.49
8	.67**	.61
9	.85**	.81
10	.70**	.63
11	.59**	.51
12	.64**	.56
13	.56**	.55
14	.50**	.49
15	.59**	.53
16	.45**	.42
17	.68**	.63
18	.58**	.53

*p**<.01*

Consequently, the study employed item total correlation analysis to assess the internal consistency of all the study scales and its subscales. Furthermore, for the Cognitive Functioning Self-Assessment Scale (CFSS), item total correlation was found to range between .43 and .86 at significant level of $p < .01$, while corrected item-total correlation ranged from .53 to .82. The scores obtained by all the items confirm the reliability and internal consistency of the scale in general, which makes it appropriate for the use in the main study to test the hypotheses.

3.15. Table 5

Item Total Correlation and Corrected Item Total Correlation of Short Imaginal Process Inventory with its Sub-Scales(N=70)

Item	Item-Total-Correlation	Corrected Item-Total-Correlation
	Positive Constructive Daydreaming	
2	.57**	.51
4	.76**	.70
7	.68**	.71
10	.75**	.82
15	.85**	.64
17	.69**	.87
19	.89**	.64
22	.72**	.62
26	.64**	.57
28	.64**	.60
31	.81**	.77
36	.79**	.76
38	.72**	.66
40	.83**	.82
43	.84**	.80
	Guilt & Fear of Failure Daydreaming	
3	.81**	.77
6	.51**	.34
9	.86**	.82
12	.83**	.79

14	.87**	.83
18	.67**	.62
21	.77**	.72
24	.83**	.79
27	.82**	.77
30	.62**	.53
32	.64**	.57
34	.89**	.86
37	.78**	.70
41	.79**	.73
44	.59**	.49
	Poor Attentional Control	
1	.61**	.55
5	.58**	.47
8	.62**	.54
11	.65**	.57
13	.56**	.50
16	.66**	.58
20	.76**	.72
23	.59**	.50
25	.69**	.61
29	.76**	.70

33	.72**	.66
35	.77**	.71
39	.65**	.57
42	.41**	.34
45	.54**	.44

p<.05, p**<.01.*

Internal consistency of the SIPI was also established by assessing item-total correlations on each of the subscales. Values for item-total correlation ranged from .41 to .89 and corrected item-total correlations ranged from .34 to .86. The positive correlation displaying the correlations between all the items and the overall scale score provide the reliability of the scale and validity for the items indicated the appropriateness of the scale for using it in the main study to test the hypotheses.

3.16. Table 6

Item Total Correlation and Corrected Item Total Correlation of Problem Solving Inventory (N=70)

Item	Item-Total Correlation	Corrected Item-Total-Correlation	Item	Item-Total Correlation	Corrected Item-Total-Correlation
1	.54**	.51	2	.49**	.43
3	.39**	.32	4	.45**	.39
5	.37**	.31	6	.44**	.39
7	.49**	.46	8	.47**	.42
10	.62**	.57	11	.56**	.50
12	.64**	.59	13	.62**	.57
14	.61**	.58	15	.61**	.56
16	.48**	.47	17	.68**	.61
18	.57**	.53	19	.59**	.49
20	.48**	.42	21	.49**	.39
23	.59**	.54	24	.42**	.37
25	.61**	.57	26	.58**	.52
27	.45**	.43	28	.46**	.41
30	.55**	.49	31	.62**	.53
32	.39**	.33	33	.51**	.47
34	.42**	.38	35	.47**	.38

***p<.01*

The internal consistency score of the Problem Solving Inventory (PSI), ranged from .37 ($p < .01$) to .68 ($p < .01$) are given in Table 6. Each item was positively correlated with all items, and the scale displayed strong internal consistency; validating for the use of the scale for the main study to test the hypotheses.

3.17. Table 7

Item Total Correlation and Corrected Item total Correlation of Warwick Edinburgh Mental Wellbeing Scale (N=70)

Item	Item-Total-Correlation	Corrected Item-Total-Correlation
1	.66**	.60
2	.77**	.72
3	.73**	.69
4	.52**	.41
5	.67**	.60
6	.64**	.56
7	.65**	.60
8	.73**	.67
9	.61**	.54
10	.65**	.58
11	.61**	.54
12	.70**	.63
13	.75**	.71
14	.85**	.81

***p<.01*

The item-total correlations of Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) range between .52, ($p < .01$) and .85, ($p < .01$) as shown in Table 7. Positive coefficients in the internal consistency prove that the focus areas of the scale possess satisfactory reliability and therefore it is suitable to employ the scale in the main research for empirically testing the hypotheses.

3.18. Objectives and Methodology of the Pilot Study

The principal objective of the pilot study was to establish the psychometric properties of the research measures and test the patterns of the association between the study variables. This gave an insight into the existing literature disclosing ongoing patterns and relationships between these variables. As mentioned, to determine the reliability of the scale for the actual study, the questionnaires were pre-tested with a 70- sample size comprising of university students. To determine the demographic frequencies and percentage, the cross-tabulation of these factors was done. The reliability coefficients as well as the item-total correlation for all four instruments, CFSS, PCD, GFF, PAC, PSI and WEMWBS, together with their sub-scales were computed.

Based on the objectives of the pilot study, there is perceptible interaction between the study variables in terms of their cognitive and emotional components. Past research has underscored that cognitive enhancements leads to optimistic thinking styles and effective ways of handling different issues, which in return fosters better mental wellbeing (Biggs et al., 2017; Dockray & Steptoe, 2010). On the other hand, there are several maladaptive thinking patterns, for example, guilt, and fear of failure and poor attention control, triggering negative outcomes in problem-solving and well-being. Such data supports the research findings suggesting that negative cognitions and attention-deficits culminate academic and emotional dysfunctions (Choon et al., 2015; Rogers & Joiner, 2017).

3.18.1. Psychometric Evaluation and Descriptive Analysis of Study Scales. The main objective of the pilot study was to establish reliability and other psychometric properties of all the research instruments before employing them on a larger sample body in the main study. Internal consistency estimates and item-total correlations were calculated for the CFSS, all subscales of the SIPI, PSI, as well as the WEMWBS.

Cronbach's alpha for CFSS revealed to be .81 signifying high internal consistency to measure the cognitive functioning among the university students. This was in line with the study conducted by Annunziata et al., (2012) who obtained an alpha of .87. Likewise, the results of internal consistency were high for the SIPI subscales; hence PCD = .82; GFF = .76; and PAC = .80 for this study, while, Huba et al. (1982) have stated reliability estimates to be .80 to .83.

The PSI had a reliability coefficient of .84 validating its robustness of gauging perceived problem solving skills as asserted by Heppner and Petersen (1982). Furthermore, the WEMWBS showed good internal consistency with Cronbach's coefficient of .81 in line with Tennant et al. (2007) reliability estimates for the measure. For study scales and subscales, several statistical measures were used for descriptive analysis. The results highlighted the data to be normally distributed, validating the hypothesis testing to be carried out on the main study.

3.18.2. Psychometric Reliability and Internal Consistency of Study Scales. For the Cognitive Functioning Self-Assessment Scale (CFSS), item-total correlations as presented on table 3 were well supported statistically for all the items hence indicating that the scale is appropriate for gauging cognitive functioning of university students. As displayed in table 4, the item-total correlations for the subscales of the Short Imaginal Process Inventory (SIPI) including Positive Constructive Daydreaming (PCD), Guilt and Fear of Failure Daydreaming (GFF) and Poor Attentional Control (PAC) were also significant, confirming the subscales' reliability for measuring distinct dimensions of self-generated thoughts.

The Problem-Solving Inventory (PSI) demonstrated consistent item-total correlations (Table 5), affirming its reliability in assessing perceived problem-solving abilities. Lastly, the Warwick Edinburgh Mental Well-Being Scale (WEMWBS) showed strong item-total

correlations (Table 6), establishing it as a reliable instrument for assessing mental well-being. These findings underscore the psychometric consistency of all scales used in the study, supporting their use for hypothesis testing in the main research.

3.19. Phase II: Exploring the Predictive and Mediating Effects of Cognitive Functioning and Self-generated Thoughts

Phase II of the study focused on investigating the predictive role of cognitive functioning and self-generated thoughts on problem-solving and mental well-being among university students. Additionally, it aimed to explore the mediating effects of self-generated thoughts. The specific objectives of this phase included:

3.19.1. Objectives. The main study has the following key objectives:

1. To investigate the relationship between cognitive functioning, self-generated thoughts (positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control), problem solving and mental well-being among university students.
2. To examine the mediating role of self-generated thoughts (i.e., positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control) in the relationship between cognitive functioning, and problem solving among university students.
3. To examine the mediating role of self-generated thoughts (i.e., positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control) in the relationship between cognitive functioning, and mental well-being among university students.
4. To analyze group differences in cognitive functioning, self-generated thoughts, problem solving, and mental well-being based on demographic variables among university students.

3.19.2. Demographic Characteristics of the Sample. The sample for the main study consists of 400 participants, with 45% male (n=180) and 55% female (n=220). The age distribution showed that most participants were emerging adults, comprising 73.8% (n=295),

while established adults made up 26.3% (n=105). In terms of family system, 31.5% of participants (n=126) came from nuclear families, while 68.5% (n=274) were from joint family systems. Regarding marital status, the sample was predominantly single (78.8%, n=315), followed by engaged (12%, n=48) and married participants (9.3%, n=37). Educationally, the participants included 68.3% undergraduates (n=273), 22.3% graduates (n=89), and 9.5% post-graduates (n=38). The age distribution of participants shows that the majority, 73.8%, are emerging adults, while established adults make up 26.3% of the sample. An extensive analysis of the research variables across various demographic groups was made possible by this varied sample.

3.20. Table 8

Demographic Profile of the Sample with Frequencies and Percentages (N = 400)

Variables	*f*	%
Gender		
Males	180	45.0
Females	220	55.0
Age		
Emerging Adults	295	73.8
Established Adults	105	26.3
Family System		
Nuclear	126	31.5
Joint	274	68.5
Marital Status		
Single	315	78.8
Engaged	48	12.0
Married	37	9.3
Education		
Undergraduate	273	68.3
Graduate	89	22.3
Post-graduate	38	9.5

f= Frequency, %= Percentage

3.21. Instruments. The main study employed the instruments listed below, which were previously employed in the pilot study:

1. Consent Form with Demographic Sheet

2. Cognitive Functioning Self-Assessment Scale (CFSS)

3. Short Imaginal Processes Inventory (SIPI)

4. Problem-Solving Inventory (PSI)

5. Warwick-Edinburgh Mental Well-Being Scale (WEMWBS)

3.22. Data Collection Procedure. The researcher employed a convenience sampling approach for data collection, reaching out to participants from multiple universities in Rawalpindi and Islamabad. Participants were given a concise summary of the study's aims and objectives, ensuring transparency and adherence to ethical standards. Participants were guaranteed their privacy and confidentiality, as well as the freedom to withdraw from the study at any stage without any repercussions.

Informed consent was obtained through a signed consent form, along with the collection of demographic information. Participants then received a booklet containing the Cognitive Functioning Self-Assessment Scale (CFSS), Short Imaginal Processes Inventory (SIPI), Problem-Solving Inventory (PSI), and Warwick Edinburgh Mental Well-being Scale (WEMWBS).

Questionnaires were carried out individually, and it took approximately 20 minutes for each participant to complete the assessment. Following data collection, the responses were prepared for analysis.

Chapter 4

4. RESULTS OF HYPOTHESES TESTING AND MEDIATION ANALYSIS

The following segment outlines the primary analyses' results to evaluate the study's hypotheses. The main goal was to investigate the association between cognitive functioning, problem solving, and mental well-being, with a specific focus on the mediating influence of self-generated thoughts, encompassing dimensions such as positive constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control.

4.1. Table 9

Alpha coefficients, and descriptive statistics of the study variables (N=400)

	α	M(SD)	Skewness	Kurtosis	Range	
					Actual	Potential
CFSS	.85	79.04(11.82)	-.83	-.72	48-90	18-90
SIPI						
PCD	.74	53.59(9.16)	-.46	-.55	24-71	12-72
GFF	.84	40.53(15.84)	.50	-1.25	15-73	15-75
PAC	.82	40.22(17.03)	.59	-1.31	15-73	15-75
PSI	.81	132.56(34.19)	-.57	-1.17	62-192	32-192
WEBMWBS	.87	46.61(15.87)	-.52	-1.32	14-70	14-70

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PSI=Problem Solving Inventory; WEMWBS=Warwick-Edinburgh Mental Well-being Scale

The Cognitive Functioning Self-Assessment Scale, Short Imaginal Process Inventory (i.e. Positive Constructive Daydreaming, Guilt and Fear of Failure Daydreaming and Poor Attentional Control), Problem Solving Inventory and Warwick-Edinburgh Mental Well-being Scale's descriptive statistics and alpha coefficients are illustrated in Table 9.

4.2. Table 10

Correlation of the study variables(N=400)

	1	2	3	4	5	6
1.CFSS	-	.67**	-.83**	-.85**	.84**	.85**
SIPI						
2.PCD	-	-	-.69**	-.69**	.67**	.65**
3.GFF	-	-	-	.94**	-.86**	-.87**
4.PAC	-	-	-	-	-.90**	-.90**
5.PSI	-	-	-	-	-	.92**
6.WEMWBS	-	-	-	-	-	-

***p<.01*

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PAC=Poor Attentional Contril; PSI=Problem Solving Inventory; WEMWBS=Warwick-Edinburgh Mental Well-being Scale

Table 10 shows the bivariate correlations between CFSS, PCD, GFF, PAC, PSI, and WEMWBS. Both problem solving and mental well-being emerged to be significantly positively correlated with cognitive functioning (**p < .01). Positive constructive daydreaming was also positively correlated with cognitive functioning and problem solving (**p < .01). Conversely, guilt and fear of failure and poor attentional control showed negative correlations with both problem solving and mental wellbeing (**p < .01).

4.3. Table 11

Linear Regression Analysis on University Students' Problem Solving by Cognitive Functioning (N=400)

	Problem Solving				95% CI	
Cognitive Functioning	*B*	*SE B*	*β*	*T*	*LL*	*UL*
	2.43	.08	.84	30.9	2.2	2.5

$R = .84$, $R^2 = .70$ ($F = 954.73^{**}$)

$^{**}p < .001$

The influence of cognitive functioning on university students' ability to solve problems was investigated using a linear regression analysis. The results indicated that cognitive functioning accounted for 70% of the variance in problem-solving, supported by a highly significant F ratio ($\Delta R^2 = .70$, $F = 954.73$, $p < .001$). Based on the beta coefficients, a one-unit rise in cognitive functioning was associated with a corresponding 2.43 units increase in problem-solving ($B = 2.43$, $\beta = .84$, $p < .001$). Overall, results indicate that higher cognitive functioning levels significantly improve university students' problem-solving ability.

4.4. Table 12

Linear Regression Analysis on University Students' Mental Wellbeing by Cognitive Functioning (N=400)

	Mental Wellbeing				95% CI	
Cognitive Functioning	*B*	*SE B*	*β*	*T*	*LL*	*UL*
	1.15	.04	.85	32.7	1.1	1.2

$R = .85$, $R^2 = .72$ ($F = 1068.82^{**}$)

$^{**}p < .001$

The influence of cognitive functioning on university students' mental well-being was investigated using linear regression analysis. The results showed that 72% of the variation in university students' mental well-being could be explained by cognitive functioning, with a notably high F ratio ($\Delta R2 = .72$, $F = 1068.82$, $p < .001$). The beta weights indicate that a one-unit improvement in cognitive functioning results in an increase of 1.15 units in mental well-being ($B = 1.15$, $\beta = .85$, $p < .001$). Therefore, the findings exhibit that higher levels of cognitive functioning significantly enhance mental well-being among university students.

4.5. Table 13

Linear Regression Analysis on University Students' Positive Constructive Daydreaming by Cognitive Functioning (N=400)

			PCD		95% CI	
Cognitive Functioning	*B*	*SE B*	*β*	*T*	*LL*	*UL*
	.52	.03	.67	18.1	.46	.57

R = .67, R^2= .45 (F=324.75**)

**p<.001

Note. PCD=Positive Constructive Daydreaming

The impact of cognitive functioning on positive constructive daydreaming in university students was investigated using linear regression analysis. The results illustrated a considerably high F ratio (ΔR^2 =.45, F = 324.75, p <.001), indicating that cognitive functioning attributed to 45% of the variability in positive constructive daydreaming among university students. Positive constructive daydreaming increases by 0.52 units for every unit increase in cognitive functioning, according to the beta weights (B = 0.52, β =.67, p <.001). According to the findings, university students who have higher cognitive functioning levels engage in more positive constructive daydreaming.

4.6. Table 14

Linear Regression Analysis on University Students' Guilt and Fear of Failure Daydreaming by Cognitive Functioning (N=400)

			GFF		95% CI	
Cognitive Functioning	*B*	*SE B*	*β*	*T*	*LL*	*UL*
	-1.1	.04	-.82	-28.91	-	-1.1
R = -.82, R^2= .67 (F=836.04**)					1.2	

**p<.001

Note. GFF=Guilt and Fear of Failure Daydreaming

The influence of cognitive functioning on university students' daydreaming related to guilt and fear of failure. was assessed using a linear regression analysis. The results, supported by a notably high F ratio showed that cognitive functioning accounted for 67% of the variation in guilt and fear of failure daydreaming among university students ($\Delta R^2 = .67$, $F = 836.04$, $p < .001$). The beta weights indicate that a one-unit increase in cognitive functioning results in a decrease in guilt and fear of failure daydreaming by 1.1 units ($B = -1.1$, $\beta = -.82$, $p < .001$). Overall, results indicate that higher levels of cognitive functioning significantly reduce guilt and fear of failure daydreaming among university students.

4.7. Table 15

Linear Regression Analysis on University Students' Poor Attentional Control by Cognitive Functioning (N=400)

			PAC		95% CI	
Cognitive Functioning	*B*	*SE B*	*β*	*T*	*LL*	*UL*
	-1.2	.03	-.85	-32.57	-	-1.1
R = -.85, R^2= .72 (F=1060.81**)					1.3	

**p<.001

Note. PAC=Poor Attentional Control

To explore the influence of cognitive functioning on university students' poor attentional control linear regression analysis was conducted. According to the findings, 72% of the variance in poor attentional control could be explained by cognitive functioning, subsequently the F ratio being noticeably high ($\Delta R2 = .72$, $F = 1060.81^{**}$, $p < .001$). Following the beta coefficients, a one-unit increase in cognitive functioning leads to a reduction of 1.2 units in poor attentional control ($B = -1.2$, $\beta = -.85$, $p < .001$). In general, results indicate that higher levels of cognitive functioning significantly reduce poor attentional control among university students.

4.8. Table 16

Multiple Regression Analysis on University Students' Mental Wellbeing by Self-generated Thoughts (N=400)

	Mental Wellbeing					
					95% CI	
	B	*SE B*	*B*	*T*	*LL*	*UL*
PCD	.06	.05	.03	1.11	-.04	.158
GFF	-.19	.06	-.19**	-.328	-.31	-.08
PAC	-.65	.05	-.70**	11.74	-.76	-.54
	$R = .91$, $\Delta R^2 = .82$ ($F = 633.07$**)					

***p<.001*

Note. PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PAC=Poor Attentional Control

The findings of multiple regression analysis revealed that self-generated thoughts explained 82% of the variability in mental well-being among university students, with a substantially notable F ratio ($\Delta R^2 = .82$, $F = 633.07$, $p < .01$). The beta weights show that mental well-being will decrease by.19 units for every unit rise daydreaming related to guilt and fear of failure ($B = -.19$, $\beta = -.19$, $p < .01$). The beta weights also indicated that mental well-being will drop by.65 units for every unit increase in poor attentional control ($B = -.65$, $\beta = -.70$, $p < .01$).

4.9. Table 17

Multiple Regression Analysis on University Students' Problem Solving by Self-generated Thoughts (N=400)

	Problem Solving					
					95% CI	
	B	*SE B*	*B*	*T*	*LL*	*UL*
PCD	.31	.11	.08**	2.78	.09	.53
GFF	-.18	.13	-.08	-1.47	-.44	.07
PAC	-1.54	.12	-.76**	-12.71	-1.78	-1.30
	$R = .90$, $\Delta R^2 = .82$ ($F = 613.05$**)					

***p<.001*

Note. PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PAC=Poor Attentional Control

A multiple regression analysis was carried out, and the results indicated that self-generated thoughts explained 82% of the variability in problem solving among university students, with a significantly elevated F ratio ($\Delta R^2 = .82$, $F = 613.05$, $p < .01$). The beta weights suggest that a one-unit rise in positive constructive daydreaming leads to an improvement in problem-solving by .31 units ($B = .31$, $\beta = .08$, $p < .01$). Furthermore, the beta weights indicated that a one-unit increase in poor attentional control results in a decrease of 1.54 units in problem-solving. ($B = -1.54$, $\beta = -.76$, $p < .01$).

Mediation Analysis. Mediation analyses were conducted to examine the role of self-generated thoughts (i.e., positive-constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control) in the relationship between cognitive functioning and problem-solving, as well as mental well-being among university students. Process Macro (Hayes, 2013) was employed for these analyses, which allows for the evaluation of path models, including moderation and mediation effects.

4.10. Table 18

Mediation analysis for Positive Constructive Daydreaming in the relationship between Cognitive Functioning and Problem Solving among University Students (N=400)

	Problem Solving		95% CL	
Predictors	Model I B	Model II B	LL	UL
(Constant)	-59.57***	-69.12***		
CF	2.43***	2.04***		
PCD		.76***	.50	1.02
(Indirect Effect-CF-PCD-PS)		.40	.21	.61
R2 = .73, ΔR2=.02, F = 954.74***				

**p<.05, **p<.01, ***p<.000*
Note. CL=Confidence Limit; LL=Lower Limit: UL=Upper Limit; CF=Cognitive Functioning, PCD=Positive Constructive Daydreaming, PS=Problem Solving

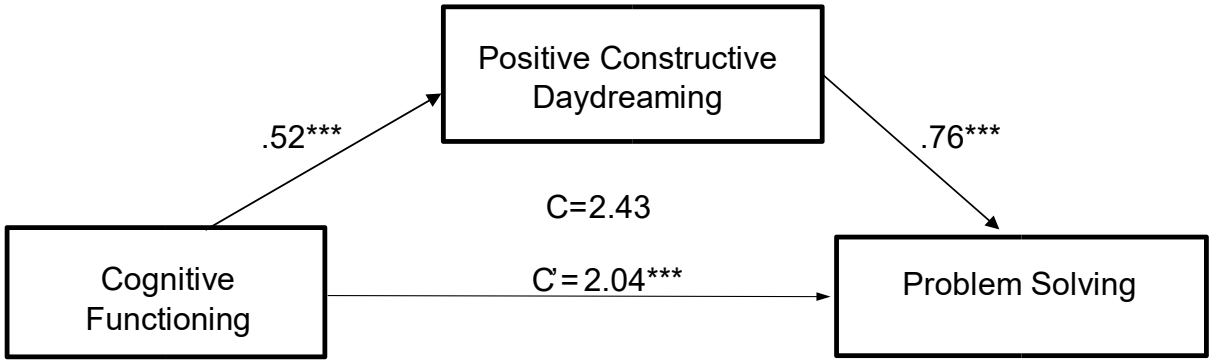

Figure 2: Mediating effect of Positive Constructive Daydreaming in the relationship between Cognitive Functioning and Problem Solving

The results of a simple mediation analysis examining the impact of positive constructive daydreaming on the connection between cognitive functioning and problem solving among university students are displayed in Table 18. The direct effect values indicate that positive constructive daydreaming contributes significantly to the development of a

cause-and-effect relationship between cognitive functioning and problem solving. The strength of the indirect effect was statistically significant, as indicated by the coefficient B = 0.40, p< 0.001 and the strength of the direct effect remained high (C'=2.04, p<0.001). These results suggest that positive constructive daydreaming partially mediates the relationship between cognitive functioning and problem solving. The direct and indirect impacts of cognitive functioning and problem solving are explicitly shown in the route diagram (Figure 2). These diagrams illustrate a substantial and immediate impact of cognitive functioning on problem solving, with partial mediation by positive constructive daydreaming.

4.11. Table 19

Mediation analysis for Guilt and Fear of Failure Daydreaming in the relationship between Cognitive Functioning and Problem Solving among University Students (N=400)

	Problem Solving		95% CL	
Predictors	Model I B	Model II B	LL	UL
(Constant)	-59.57***	84.46***		
CF	2.43***	1.19***		
GFF		-1.12***	-1.29	-.95
(Indirect Effect-CF-GFF-PS)		1.25	.99	1.49
R2 = .79, ΔR2=.09, F = 954.74***				

**p<.05, **p<.01, ***p<.000*

Note. CL=Confidence Limit; LL=Lower Limit: UL=Upper Limit; CF=Cognitive Functioning; GFF=Guilt and Fear of Failure Daydreaming; PS=Problem Solving

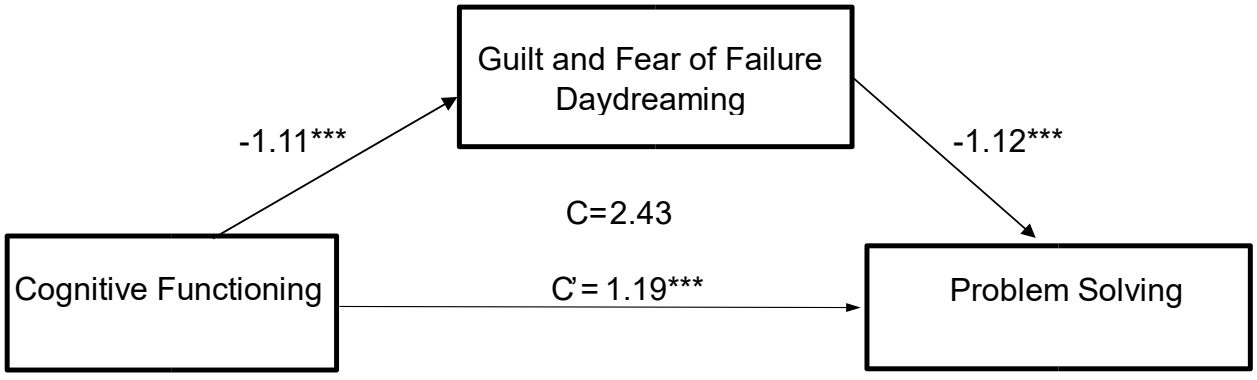

Figure 3: Mediating effect of Guilt and Fear of Failure Daydreaming in the relationship between Cognitive Functioning and Problem Solving

Table 19 highlights the findings of examining the impact of guilt and fear of failure daydreaming on the connection between cognitive functioning and problem solving among university students using simple mediation analysis. The direct effect values indicate that

guilt and fear of failure daydreaming play crucial in mediating the causal connection between cognitive functioning and problem solving. According to the coefficients of the indirect effect ($B=1.25$, $p<.001$), the effect was statistically significant, the strength of the direct effect remained high ($C'=1.19$, $p<.001$). These results suggest that guilt and fear of failure daydreaming partially mediates the relationship between cognitive functioning and problem solving.

The route diagram (Figure 3) clearly demonstrates the direct and indirect impacts of cognitive functioning and problem solving. The path values ($B=-1.11$, $p<.001$ and $B=-1.12$, $p<.001$) indicate negative relationships between cognitive functioning, guilt and fear of failure daydreaming, and problem solving. These diagrams illustrate a substantial direct effect of cognitive functioning on problem solving, partially mediated by guilt and fear of failure daydreaming.

4.12. Table 20

Mediation analysis for Poor Attentional Control in the relationship between Cognitive Functioning and Problem Solving among University Students (N=400)

	Problem Solving		95% CL	
Predictors	Model I B	Model II B	LL	UL
(Constant)	-59.57***	130.37***		
CF	2.43***	.74***		
PAC		-1.34***	-1.53	-1.23
(Indirect Effect-CF-PAC-PS)		1.69	1.46	1.94
R2 = .84, ΔR2=.14, F = 954.74***				

**p<.05, **p<.01, ***p<.000*

Note. CL=Confidence Limit; LL=Lower Limit; UL=Upper Limit; CF=Cognitive Functioning; PAC=Poor Attentional Control; PS=Problem Solving

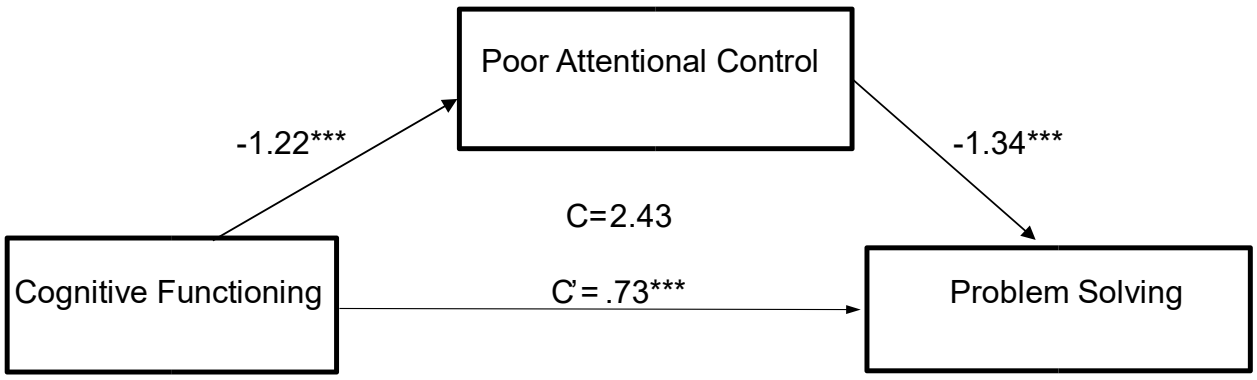

Figure 4: Mediating Effect of Poor Attentional Control in the relationship between Cognitive Functioning and Problem Solving

Table 20 highlights the results of a simple mediation analysis examining the impact of poor attentional control on the connection between cognitive functioning and problem solving among university students. The direct effect values indicate that poor attentional

control plays a minimal role in mediating the causal connection between cognitive functioning and problem solving. The indirect effect, represented by the coefficient B=1.69, p<.001, was statistically significant, the strength of the direct effect remained high (C′=.73, p<.001). These results suggest that poor attentional control partially mediates the relationship between cognitive functioning and problem solving.

The route diagram (Figure 4) clearly demonstrates the direct and indirect impacts of cognitive functioning and problem solving. The path values (B=−1.22, p<.001 and B=−1.34, p<.001) indicate negative relationships between cognitive functioning, poor attentional control, and problem solving. These diagrams illustrate a substantial direct effect of cognitive functioning on problem solving, partially mediated by poor attentional control.

4.13. Table 21

Mediation analysis for Positive Constructive Daydreaming in the relationship between Cognitive Functioning and Mental Well-being among University Students (N=400)

	Mental Well-being		95% CL	
Predictors	Model I B	Model II B	LL	UL
(Constant)	-44.05***	-47.36***		
CF	1.15***	1.01***		
PCD		.264***	.14	.38
(Indirect Effect-CF-PCD-MWB)		.13	.05	.22
R2 = .74, ΔR2=.02, F = 1068.82***				

**p<.05, **p<.01, ***p<.000*

Note. CL= Confidence Limit; LL=Lower Limit; UL=Upper Limit; CF=Cognitive Functioning, PCD=Positive Constructive Daydreaming, MWB=Mental Wellbeing

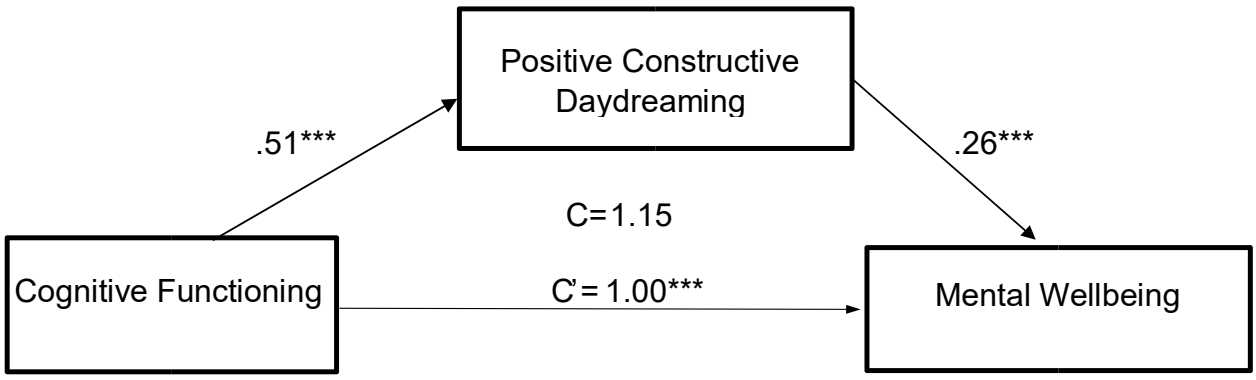

Figure 5: Mediating effect of Positive Constructive Daydreaming in the relationship between Cognitive Functioning and Mental Wellbeing

The results of a simple mediation analysis examining the impact of positive constructive daydreaming on the connection between university students' cognitive functioning and mental well-being are shown in Table 21. The direct effect values indicate that cognitive functioning has a significant direct impact on mental well-being (C′=1.00). The

indirect effect, represented by B=0.13, was statistically significant. These results suggest that positive constructive daydreaming partially mediates the relationship between cognitive functioning and mental well-being.

The route diagram (Figure 5) clearly demonstrates the direct and indirect impacts of cognitive functioning on mental well-being. The path values (B=.51, p<.001) and (B=0.26, p<.001) indicates the mediating role of positive constructive daydreaming. These diagrams illustrate a significant direct effect of cognitive functioning on mental well-being, along with the mediated influence of positive constructive daydreaming.

4.14. Table 22

Mediation analysis for Guil and Fear of Failure Daydreaming in the relationship between Cognitive Functioning and Mental Wellbeing among University Students (N=400)

	Mental Well-being		95% CL	
Predictors	Model I B	Model II B	LL	UL
(Constant)	-44.05***	23.83***		
CF	1.15***	.56***		
GFF		-.54***	-.60	-.45
(Indirect effect-CF-GFF-MWB)		.59	.48	.69
R2 = .81, ΔR2=.09, F = 1068.82***				

**p<.05, **p<.01, ***p<.000*

Note. CL=Confidence Limit; LL=Lower Limit; UL=Upper Limit; CF=Cognitive Functioning, GFF=Guilt and Fear of Failure Daydreaming, MWB=Mental Well-being

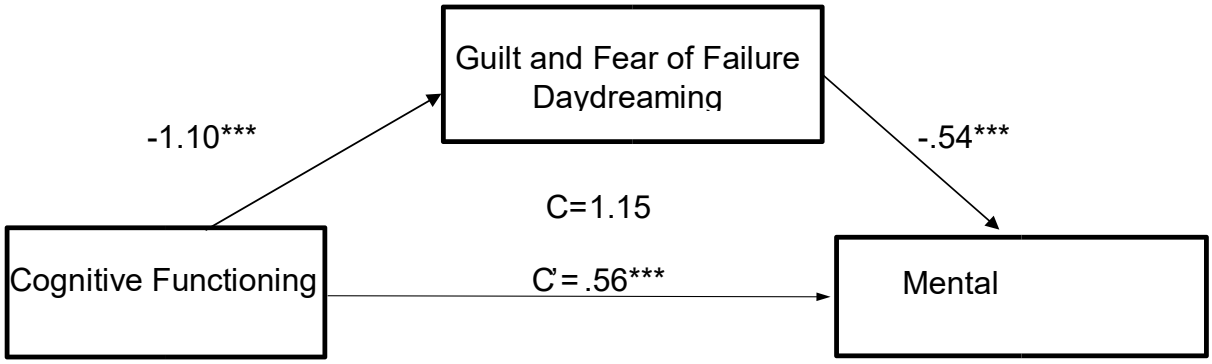

Figure 6: Mediating effect of Guilt and Fear of Failure Daydreaming in the relationship between Cognitive Functioning and Mental Wellbeing

Table 22 summarizes the outcomes of simple mediation analysis evaluating the impact of daydreaming related to guilt and fear of failure on the connection between cognitive functioning and mental well-being among university students. The direct effect

values indicate that guilt and fear of failure daydreaming has a partial mediating effect on the relationship between cognitive functioning and mental well-being. The indirect effect, represented by B=.59, p<.001, was statistically significant. Despite this, the strength of the direct effect remained high (C′=0.56, p<.001). These results suggest that guilt and fear of failure daydreaming plays a minor but significant mediating role.

The route diagram (Figure 6) clearly demonstrates the direct and indirect impacts of cognitive functioning and mental well-being. The path values (B=−1.10, p<.001) and (B=−0.54, p<.001) indicate a negative relationship between cognitive functioning, guilt and fear of failure daydreaming, and mental well-being. These diagrams illustrate a significant direct effect of cognitive functioning on mental well-being, along with the partial mediation by guilt and fear of failure daydreaming.

4.15. Table 23

Mediation analysis for Poor Attentional Control in the relationship between Cognitive Functioning and Mental Wellbeing among University Students (N=400)

	Mental Wellbeing		95% CL	
Predictors	Model I B	Model II B	LL	UL
(Constant)	-44.05***	39.72***		
CF	1.15***	.39***		
PAC		-.61***	-.68	-.54
(Indirect Effect-CF-PAC-MWB)		.74	.64	.85
R2 = .84, ΔR2=.12, F = 1068.82***				

**p<.05, **p<.01, ***p<.000*

Note. CL=Confidence Limit; LL=Lower Limit; UL=Upper Limit; CF=Cognitive Functioning, PAC=Poor Attentional Control, MWB=Mental Wellbeing

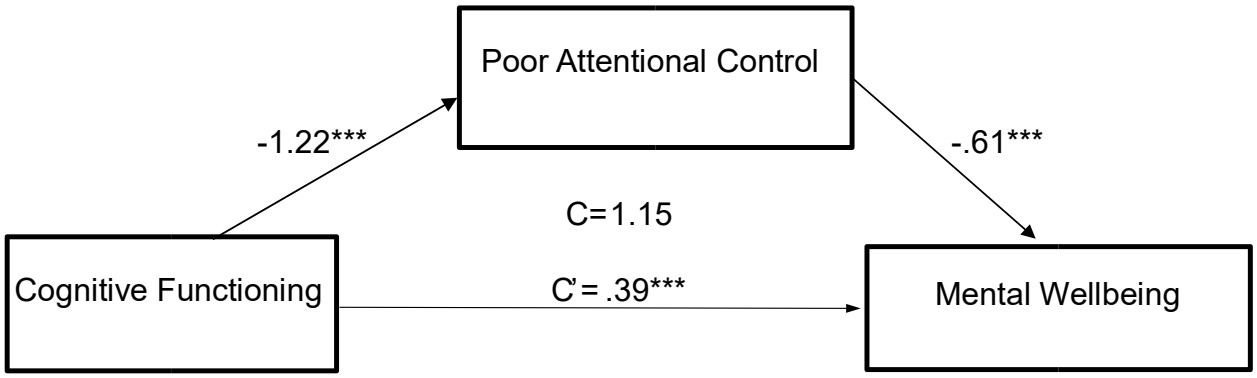

Figure 7: Mediating effect of Poor Attentional Control in the relationship between Cognitive Functioning and Mental Wellbeing

Table 23 outlines the results of a simple mediation analysis examining the impact of poor attentional control on the association between cognitive functioning and mental well-

being among university students. The direct effect values indicate that poor attentional control partially mediates the relationship between cognitive functioning and mental well-being. The indirect effect, represented by B=.64, p<.001, was statistically significant. However, the strength of the direct effect remained moderate (C′=0.39, p<.001). These results suggest that poor attentional control plays a meaningful role in mediating this relationship.

The route diagram (Figure 7) demonstrates the direct and indirect impacts of cognitive functioning on mental well-being. The path values (B=−1.22, p<.001) and (B=−0.61, p<.001) indicate a negative relationship between cognitive functioning, poor attentional control, and mental well-being. These diagrams illustrate a significant direct effect of cognitive functioning on mental well-being, along with substantial mediation by poor attentional control.

4.16. Table 24

Means, SDs, and t values based on Gender of Cognitive Functioning, Sub-scales of Short Imaginal Process Inventory, Problem Solving and Mental Well-being among University Students (N=400)

	Male (n=180)		Female (n=220)						95% CI	
Variables	M	SD	M	SD	t	df	p	Cohens d	LL	UL
CF	84.07	8.30	74.92	12.65	8.67	381	.000	.84	7.07	11.21
SIPI										
PCD	56.72	6.92	51.03	9.94	6.72	388	.000	.65	4.02	7.35
GFF	33.24	11.77	46.50	16.25	-9.44	392	.000	-.92	-16.01	-10.49
PAC	31.76	12.68	47.14	16.97	-10.35	394	.000	-1.01	-18.29	-12.45
PS	146.62	23.65	121.05	37.10	8.35	376	.000	.81	19.55	31.59
MWB	53.36	11.54	41.09	16.79	8.62	387	.000	.84	9.47	15.06

****p<.001, *p<.05*

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF= Guilt and Fear of Failure Daydreaming; PSI=Problem Solving Inventory; WEMWBS=Warwick-Edinburgh Mental Well-being Scale

Table 24 summarizes gender-based mean differences. The results imply that significant ($p < .05$) variations occur in cognitive functioning, positive constructive daydreaming, guilt and fear of failure daydreaming, poor attentional control, problem-solving, and mental well-being in both males and females.

4.17. Table 25

Means, SDs, and t values based on Family System of Cognitive Functioning, Sub-scales of Short Imaginal Process Inventory, Poor Attentional Control, Problem Solving and Mental Well-being among University Students (N=400)

	Nuclear (n=126)		Joint (n=274)					95% CI	
Variables	M	SD	M	SD	t	df	p	LL	UL
CF	77.30	13.23	79.84	11.03	-1.87	207	.06	-5.21	.13
SIPI									
PCD	53.40	8.55	53.68	9.43	-2.82	398	.77	-2.21	1.66
GFF	41.63	16.25	40.02	15.64	.94	398	.34	-1.73	4.96
PAC	40.91	17.47	39.90	16.80	.55	398	.58	-2.58	4.61
PS	131.96	34.52	132.83	34.09	-.23	398	.81	-8.11	6.37
MWB	46.21	16.30	46.80	15.70	-.34	398	.73	-3.94	2.78

****p<.001, *p<.05*

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure Daydreaming; PAC=Poor Attentional Control; PSI=Problem Solving Inventory; WEMWBS=Warwick-Edinburgh Mental Well-being Scale

Table 25 illustrates the mean differences according to family system. The results indicate that no significant differences ($p > .05$) were observed across the variables, including cognitive functioning, positive constructive daydreaming, guilt and fear of failure daydreaming, poor attentional control, problem-solving, and mental well-being, between nuclear and joint family systems.

4.18. Table 26

Means, SDs, and t values based on Age Groups of Cognitive Functioning, Sub-scales of Short Imaginal Process Inventory, Problem Solving and Mental Well-being among University Students (N=400)

	Emerging Adults (n=295)		Established Adults (n=105)						95% CI	
Variables	M	SD	M	SD	t	Cohens d	df	P	LL	UL
CF	76.27	12.41	86.81	4.18	-12.69	.97	397	.000	-12.17	-8.90
SIPI										
PCD	52.58	9.46	56.41	7.58	-4.14	.43	226	.000	-5.64	-2.00
GFF	43.75	16.64	31.50	8.25	9.72	-.82	357	.000	9.77	14.72
PAC	44.05	17.88	29.46	6.78	11.82	-.93	396	.000	12.16	17.01
PS	123.79	34.90	157.19	14.51	-13.48	1.08	389	.000	-38.27	-28.53
MWB	42.43	16.17	58.36	6.39	-14.20	1.12	395	.000	-18.13	-13.72

****p<.001, *p<.05*

Note. CFSS=Cognitive Functioning Self-Assessment Scale; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guit and Fear of Failure Daydreaming; PAC=Poor Attentional Control; PSI=Problem Solving Inventory; WEMWBS=Warwick-Edinburgh Mental Well-being Scale

Table 26 highlights mean differences based on age groups. The values demonstrate that significant differences ($p < .05$) between emerging adults and established adults occur across all variables.

4.19. Table 27

Education-wise Comparison of Cognitive Functioning, Self-generated Thoughts, Problem Solving and Mental Well-being among University Students (N = 400)

	Undergraduate (n=273)		Graduate (n=89)		Post-Graduate (n=38)							95% CI	
	M	SD	M	SD	M	SD	F	η2	i-j	Mean (i-j)	SE	LL	UL
CF	75.61	12.51	86.67	4.90	85.76	4.91	44.03***	.18	U<G	-11.06**	.92	-13.27	-8.86
									U<P	-10.15**	1.10	-12.81	-7.49
									G<P	.91	.95	-1.41	3.24
SIPI													
PCD	52.11	9.44	58.08	7.18	53.68	7.89	15.29***	.07	U<G	-5.97**	.95	-8.26	-3.68
									U<P	4.39	1.49	.75	8.04
									G<P	-1.57	1.40	-5.03	1.88
GFF	44.61	16.73	31.96	9.05	31.29	8.21	33.18***	.14	U<G	12.66**	1.39	9.31	16.01
									U<P	13.32**	1.67	9.25	17.39
									G<P	.67	1.64	-3.34	4.67
PAC	44.89	18.12	30.25	8.12	30.03	6.40	38.52***	.16	U<G	14.64**	1.39	11.29	17.98
									U<P	14.86**	1.51	11.21	18.51
									G<P	.22	1.35	-3.06	3.50
PS	121.73	34.73	156.25	19.09	154.84	12.24	54.73***	.22	U<G	-34.52**	2.92	-41.52	-27.51
									U<P	-33.11**	2.89	-40.09	-26.13
									G<P	1.41	2.83	-5.47	8.28
MWB	41.44	16.11	57.63	8.49	58.00	4.11	58.99***	.23	U<G	-16.19**	1.33	-19.38	-13.01
									U<P	-16.56**	1.18	-19.40	-13.72
									G<P	-.37	1.12	-3.08	2.34

**p<.05, **p<.01, **p<.001*

Note. U=Undergraduate; G=Graduate; P=Postgraduate; CF=Cognitive Functioning; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming;

GFF=Guilt and Fear of Failure; PAC=Poor Attentional Control; PS=Problem Solving; MWB=Mental Well-Being

Table 27 shows the Analysis of Variance (ANOVA) results in which three educational groups (Undergraduate, Graduate, and Postgraduate) were measured. Post hoc analysis was conducted to compute mean differences across cognitive functioning, dimensions of self-generated thoughts, problem solving, and mental well-being. There is a significant difference between the undergraduate and graduate groups ($p<.001$) in cognitive functioning, with graduates scoring higher. A similar significant difference ($p<.001$) was observed between undergraduate and postgraduate groups, with postgraduates scoring higher. However, no significant difference was found between graduate and postgraduate groups ($p>.05$). For positive constructive daydreaming, a significant difference ($p<.001$) was found between undergraduate and graduate groups, with graduates scoring higher. Between graduate and postgraduate groups, no significant difference ($p>.05$) was observed. The undergraduate and postgraduate groups did not vary significantly ($p>.05$). For guilt and fear of failure, significant differences ($p<.001$) were observed between undergraduate and graduate groups, as well as between undergraduate and postgraduate groups, with undergraduates scoring higher in both comparisons. The graduate and postgraduate groups did not vary significantly ($p>.05$). For poor attentional control, significant differences were noted between Undergraduate and Graduate groups ($p<.001$) and between Undergraduate and Postgraduate groups ($p<.001$), with Undergraduates scoring higher in both cases. No significant difference was observed between graduate and postgraduate groups ($p>.05$). In problem solving, a significant difference ($p<.001$) was observed between undergraduate and graduate groups, as well as between undergraduate and postgraduate groups, with both graduates and postgraduates scoring higher. No significant difference was reported between graduate and postgraduate groups ($p>.05$). For mental well-being, a significant difference

($p<.001$) was observed between undergraduate and graduate groups, as well as between undergraduate and postgraduate groups, with both graduates and postgraduates scoring higher. No significant difference was noted between graduate and postgraduate groups ($p>.05$).

4.20. Table 28

Marital status-wise Comparison of Cognitive Functioning, Self-generated Thoughts, Problem Solving and Mental Well-being among University Students (N = 400)

	Single (n=315)		Engaged (n=48)		Married (n=37)							95% CI	
	M	SD	M	SD	M	SD	F	η2	i-j	Mean (i-j)	SE	LL	UL
CF	77.81	12.05	81.83	11.52	85.84	6.09	9.56***	.05	S<M	-8.03**	1.21	-10.98	-5.08
									S<E	-4.02*	1.80	-8.42	.38
									E<M	-4.01	1.94	-8.74	.73
SIPI													
PCD	53.28	9.19	53.88	9.45	55.86	8.28	1.35		-	-	-	-	-
GFF	42.03	16.10	37.52	15.60	31.62	9.41	8.44***	.04	S<M	10.41	1.79	6.02	14.81
									S<E	4.51**	2.43	-1.43	10.46
									E<M	5.90	2.73	-.76	12.56
PAC	41.90	17.62	36.94	14.88	30.16	7.94	9.27***	.05	S<M	11.74**	1.64	7.74	15.73
									S<E	4.96*	2.37	-.82	10.74
									E<M	6.78	2.51	.64	12.91
PS	128.29	34.50	142.73	33.70	155.73	15.49	13.93***	.07	S<M	-27.44**	3.20	-35.24	-19.65
									S<E	-14.44**	5.24	-27.28	-1.61
									E<M	13.00	5.49	-26.42	.42
MWB	44.57	16.10	51.75	14.89	57.32	7.43	14.45***	.07	S<M	-12.75**	1.52	-16.46	-9.05
									S<E	-7.18**	2.33	-12.89	-1.47
									E<M	-5.57	2.47	-11.61	.46

**p<.05, **p<.01, **p<.001*

Note. S=Single; E=Engaged; M=Married=Cognitive Functioning; SIPI=Short Imaginal Process Inventory; PCD=Positive Constructive Daydreaming; GFF=Guilt and Fear of Failure; PAC=Poor Attentional Control; PS=Problem Solving; MWB=Mental Well-Being

Table 28 shows the Analysis of Variance (ANOVA) results in which three marital groups (Single, Engaged, and Married) were measured. Post hoc analysis was conducted to compute mean differences across cognitive functioning, dimensions of self-generated thoughts, problem solving, and mental well-being. For cognitive functioning, significant differences ($p<.001$) were observed between single and married groups, as well as between single and engaged individuals ($p<.05$), with married individuals scoring higher in both comparisons. No significant difference was found between engaged and married groups ($p>.05$). For positive constructive daydreaming no significant differences ($p>.05$) were found between any of the groups. For guilt and fear of failure, a significant difference ($p<.001$) was observed between single and engaged groups, with single individuals scoring higher. No substantial differences were observed between the single and engaged groups ($p > .05$), nor between the engaged and married groups ($p > .05$). For poor attentional control, significant differences ($p<.001$) were observed between single and married groups, wit single individuals scoring higher. Additionally, a significant difference ($p<.05$) was observed between engaged and married groups, while no significant difference was found between unmarried and engaged groups ($p>.05$). In the problem solving, significant differences ($p<.001$) were found between single and married groups, as well as between single and engaged groups, with both engaged and married groups scoring higher. No significant difference was reported between engaged and married groups ($p>.05$). For mental well-being, significant differences ($p<.001$) were observed between single and married groups, as well as between single and engaged groups, with both engaged and married groups scoring higher. No significant difference was found between engaged and married groups ($p>.05$).

Chapter 5

Discussions

The current research examines the predictive role of cognitive functioning and self-generated thoughts on problem solving and mental wellbeing, particularly among university students. Additionally, the study explores how dimensions of self-generated thoughts, such as positive constructive daydreaming, guilt and fear of failure daydreaming, and poor attentional control, contribute to problem-solving and mental well-being Several predetermined measures were used for assessing the study variables which are the cognitive functioning self-assessment scale (CFSS) short imaginal process inventory (SIPI), the problem-solving inventory (PSI) and the Warwick Edinburgh mental well-being scale (WEMWBS). The questionnaires were administered using convenience sampling technique with respondents including students in universities located in Islamabad, Rawalpindi and WahCantt assuring representation of undergraduate, postgraduate and graduates. This premise can be considered as the comprehensive framework for evaluating the ongoing patterns of cognitive and emotional facets in academic environments.

5.1 Interpretative analysis

5.1.1 Cognitive Functioning and the dual nature of Self-generated Thoughts in university students.

The outcomes disclosed a moderate positive correlation between cognitive functioning and positive constructive daydreaming. This finding suggests that students with better cognitive functioning are more likely to engage in daydreaming that fosters creativity, goal-setting, and emotional well-being. Consistent with the content regulation hypotheses, effective cognitive functions allow individuals to effectively direct their mental resources into adaptive thinking patterns. Giambra and Grodsky (1989) found that individuals with greater cognitive abilities were more likely to engage in positive

daydreaming, particularly those focused on future planning and problem-solving. The current results build on this body of work, indicating that cognitive functioning not only facilitates academic and emotional regulation but also encourages creative and constructive thinking in the form of daydreaming. The implication here is that improving cognitive functioning can enable students to harness daydreaming as a tool for personal and academic growth, providing an avenue for educators and psychologists to develop strategies that channel mental resources toward positive outcomes.

Negative correlations were found between cognitive functioning and guilt- and fear-of-failure daydreaming and poor attentional control, indicating that diminished cognitive resources are associated with maladaptive thought patterns and difficulties in regulating attention. These findings are consistent with the previous literature which underscores the critical role of cognitive functioning in filtering out irrelevant or distressing information and maintaining focus on constructive tasks.

This is in accordance with Smallwood and Andrews-Hanna (2013) who stated that diminished cognitive resources augment the likelihood of dysfunctional self-generated thoughts, entailing guilt and fear of failure daydreaming and ruminative thinking. The outcomes draw attention to the need to address deficits in attention control and cognitive regulation as the areas to target in order to curb the effects of maladaptive daydreaming in the students. Specific interventions entailing cognitive training or practicing mindfulness could increase attentional control and minimize the frequency of guilt-evoking thoughts, thus eventually amplifying one's academic efficiency as well as psychological well-being.

From sociocultural backdrop of Pakistan, university students encounter overwhelming academic and household stress which generally structures their cognitive and emotional functioning, nudging their daydreaming experiences. Rafique and Amjad (2012) validated in

their study, that high academic stress among Pakistani university students often inhibits their cognitive functioning and attentive capacity, leading to unproductive thought patterns. Correspondingly, Naeem et al. (2009) in their study demonstrated that cognitive distortions and poor emotional regulation are prevalent among Pakistani students subsisting without structured mental health support, eventually facilitating maladaptive self-generated thoughts.

5.1.2. Predictive role of cognitive functioning and self-generated thoughts

Investigative outcomes disclose the positive relationship between cognitive functioning and problem solving among university students. These findings support the assertion that cognitive functions or resources are fundamental to solving problems effectively and efficiently. This accords with other studies, for instance Diamond (2013) found out that cognitive abilities are a crucial factor anchoring higher order activities including the apprehension of problems, and decision making particularly under pressure in institutional settings. The findings also commensurate with former literary evidence made by Engle (2018), whereby cognitive functions encompassing executive functions enriching the problem-solving phenomenon by enhancing the way knowledge is processed and making enlightened decisions. The findings highlight the prerogative of interventions formulated to boost executive functioning, including mindfulness training or cognitive workout that will develop student's problem-solving skills. The conclusions signify that the inclusion of cognitive skills' development programs in the student's environment may lead to improved academic performance and increased problem-solving abilities.

Moderate positive relationship between cognitive functioning and mental wellbeing signifies that efficient cognitive functioning predicts effective emotional resilience and mental wellbeing among university students. The outcomes align with Zelazo and Lyons (2012) findings outlining that executive mechanisms are instrumental, maintaining balance of

emotions and minimization of stressors. Thus, processing information efficiently and sustaining attention skills help students cope with academic stress, interpersonal conflicts and other adverse exigencies. Schweizer et al. (2013) further explained that higher order cognitive abilities are directly related to effective emotion regulation, hence leading to enhanced psychological well-being. Furthermore, Kovacs and Conway (2017) established that resources encompassing working memory are significant in managing both academic challenges and emotional health. The study also grants credence to this hypothesis that robust cognitive functioning enhances mental well-being accentuating the call for interventions that could help in cognizing enhancement for students in universities.

These findings are also supported by contextual literature whereby Rehman et al. (2011), and Shafiq and Rana (2016) documented in their study that cognitive functioning (specifically executive functioning and memory) promotes problem solving and goal-oriented behavior among university students. Similarly, Asif et al. (2020) documented cognitive functioning as predictor of optimal mental health strengthening the argument that cognitive processes serve as buffering factors for mental wellbeing.

The hypothesis underscoring that, positive constructive daydreaming would have a positive correlation with problem solving and mental well-being, was partially supported. Based on the analysis outcomes of the impact of PCD on problem solving, multiple regression revealed small but significant effects. The findings are consistent with prior studies that have established that daydreaming, especially constructive and future-oriented aids in boosting creativity and individual's problem-solving skills (Killingsworth and Gilbert, 2010; Smallwood, Haynes, et al., 2011). Thus, constructive daydreams enable a person to create a particular psychological space where it is possible to look for a solution to emerging problems, or reflect on the past, eventually amplifying positive outcomes of self-generated mentation's and the possibility to develop more creative stimuli.

However, PCD had a non-significant effect on mental well-being, which contrasts with earlier studies indicating a potential link between positive daydreaming and improved emotional regulation (Poerio et al., 2013). The lack of a significant relationship here may suggest that while positive daydreaming can be beneficial in terms of problem-solving, its impact on overall mental well-being might be more nuanced and possibly influenced by other cognitive and emotional factors not captured in this study. Moreover, the beneficial outcomes of SGTs can be more context specific, entailing environmental or subjective elements influencing the manner in which daydreaming affects the mental well-being (Ruby, 2013).

The hypothesis that daydreaming preceded by guilt and fear of failure (GFF) has a negative impact on both the problem solving and subject's well-being was partially validated by the results. GFF had a negative significant association with mental well-being. These findings align with previous research that highlights the detrimental effects of maladaptive daydreaming content, such as guilt and fear of failure, on emotional regulation and mental wellbeing outcomes (Smallwood & O'Connor, 2011; Stawarczyk et al., 2013), while the effect on problem-solving was not statistically significant, this might be due to the fact that individuals who engage in guilt and fear of failure daydreaming (GFFD) may utilize coping mechanisms that lessen its impact on problem-solving abilities. Coping mechanisms implied by these individuals may entail seeking social support or using problem-solving skills that have been cultivated or acquired by them. Moreover, the study sample may have included participants with varied intensities of GFFD, which may blunt its maladaptive effects on problem solving. Social networks, access to resources or the environmental factors may have steered problem-solving abilities thus obscuring GFF dysfunctional outcomes.

Finally, the hypothesis that poor attentional control is negatively correlated to problem solving aspects and individual's mental wellbeing was strongly validated. These findings

concur with other research studies that claim attentional control is essential in regulating emotions and efficiently solving problems (Bishop et al., 2004).

Contextualizing to the socio-cultural framework Shehzad and Mehmood (2013) documented that creativity (a core element of PCD) showed a significant positive relationship with academic problem solving. Additionally, guilt and fear of failure exhibited to be a strong contributing factor of impaired mental wellbeing among Pakistani university students (Malik & Shahid, 2016).

In Pakistan's socio-cultural environment studies by Fatima et al. (2020) and Hussain et al. (2021) revealed that poor attentional control projected to be a significant marker of heightened anxiety and depressive symptoms and emotional distress. The impairing influence of poor attentional control on problem solving was also highlighted by Rehman et al. (2017) and Qureshi et al. (2019) in their findings depicting that attention lapses impair academic problem solving and decision making among students.

5.1.3. Mediation analyses

To evaluate the mediating effect of SGTs, namely, PCD, GFF, and PAC on the relationship between CF, PS and MWB among university students, Process Macro was used that is in line with Hayes (2013). The outcomes of these analyses are crucially insightful for the proposed mediation.

From the research findings, it is evident that SGT operationalizes as a partial mediator in relationship between CF and PS among university students. Outcomes disclose specific themes of self-generated thoughts like Positive Constructive Daydreaming (PCD), Guilt and Fear of Failure Daydreaming (GFF) and Poor Attentional Control (PAC) mediate the degree of association on how cognitive functioning affects problem solving. In particular, the impact of SGTs for the explanation of the relation between cognition and problem solving partially

reported that a higher level of cognitive resources results in constructive daydreams eventually boosting the problem-solving skills. Conversely, maladaptive self-generated thoughts entailing guilt and fear of failure, as well as poor attentional control, interfere with the problem-solving process. This implies that SGTs serve as a cognitive channel by which cognitive resources affects the way we solve our problems.

Positive Constructive Daydreaming is a form of daydreaming that arises out of advanced intellectual processes and prepares the subject for problem-solving in a creative and versatile manner. These positive daydreams build coherent episodes where possible solutions to perceived problems can be mentally simulated for efficient knowledge to be applied for solving them (Smallwood & Schooler, 2015). On the contrary, Guilt and Fear of Failure Daydreaming (GFF) indirectly but negatively mediates the relationship between cognitive functioning and problem-solving. Students engrossed in GFF are more inclined to fixate on the failures and deficiencies they have identified, thus inhibiting their capacity to come up with probable solutions to challenges (Nolen-Hoeksema et al., 2008). Correspondingly, Poor Attentional Control also disrupts execution of problem-solving assignments by permitting distraction, therefore bringing about poor cognitive results in the general essence of the human ability to solve problems more specifically (Posner & Rothbart, 2007).

Since self-generated thoughts mediate cognitive functioning and problem-solving, it is clear that interventions focused on increasing cognitive flexibility, for the cognitive self-regulation of self-generated thoughts could have profound effects in problem-solving. For example, introducing students to interventions designed for an improvement in cognitive functioning entailing meditation or CBT or other efficient approaches to minimize unhealthy schemas (like guilt or fear of failure) to better solve problems. Moreover, self-facilitation strategies for attention control could enable one to stay focused on the tasks that require

problem-solving, which in turn shall help in coming up with solutions in the best way possible.

In regard to the mediation analysis, the results indicated that PCD is a mediator of a partial nature with regards to the relationships between CF and PS. However, Guilt and Fear of Failure Daydreaming and poor attentional control surfaced as negative mediators in the association between Cognitive Functioning and Problem Solving. In conclusion, where Positive Constructive Daydreaming (PCD) improves problem-solving, Guilt and Fear of Failure Daydreaming (GFF) and Poor Attentional Control (PAC) impair this process, operating as barriers to it.

The results of mediation evaluation revealed that PCD indeed mediates the relationship between CF and MWB and the mediated relationship is significant in university students. Advocating that heightened cognitive resources stimulate positive constructive mentation's eventually strengthening mental wellbeing. Probability of positive and constructive daydreaming strengthens through enhanced cognitive functioning promoting daydreams that are positive and solution-oriented, which can promote a sense of mental balance and overall well-being. This underlines the positive aspects of constructive daydreaming as a practical cognitive flow for enhancing the psychological state of university learners.

In contrast, Guilt and Fear of Failure Daydreaming (GFF) and Poor Attentional Control (PAC) serve as negative mediators in the relationship between Cognitive Functioning (CF) and Mental Well-being (MWB). Particularly, it is deduced that people who experience persistent episodes of guilt and fear of failure during daydreaming have lower level of mental well-being. Thus, the above words indicate that the negative attributes of self-generated thoughts hinder university students from dealing with stressors or promoting positive emotions. Poor Attentional Control (PAC) correspondingly acts as a mediator in a negative

pathway to cognitive functioning and mental wellbeing. Self- regulation is adversely affected in individuals with low cognitive abilities, hence such people are likely to have low attentional control hence poor management of attention and focal strength leading into decreased mental wellbeing status. This means that poor attention regulation might be counterproductive in aiming at enhanced mental wellbeing.

Therefore, positive constructive daydreaming benefits from advanced cognitive processes in terms of mental well-being; on the other hand, GFF and PAC negatively moderates the well-being of university students, signifying to focus emphasis on fostering adaptive cognitive patterns and for better psychological health.

Specifically, it suggests that interventions directed toward improving cognitive and attention-relevant mechanisms will yield worthwhile gains in university students' mental wellbeing. Education interventions that propose elements of PCD can enhance the cognitive capacity of the participants by training for developing constructive thinking patterns and enhancing rational thinking while practices involving mindfulness can assist students to control negative thoughts and emotions. CBT could also modify the negative patterns of thinking that are characteristic of GFF and combine academic and relaxation techniques in order to help students to manage stressors. These could include enhancing the performance and overall functioning of university students' cognition, as well as providing them with coping mechanisms in case things go wrong.

5.1.4. Insights into demographic disparities

Outcomes disclosed demographic disparities among different groups for CF, SGTs, MWB and PS. Gender-based distinctions reveal that male students outperformed female students in cognitive functioning, positive constructive daydreaming, problem-solving, and mental well-

being. On the other hand, female students reported higher scores in guilt and fear of failure daydreaming and poor attentional control.

These findings are partially aligned with existing literature. Research by Taylor et al. (2008) suggested that men are more likely to exhibit better cognitive abilities and problem-solving skills in academic settings, which might explain their higher scores. However, the elevated levels of guilt and fear of failure and poor attentional control observed in female students align with Nolen-Hoeksema's (2004) assertion that women may internalize cognitive and emotional stressors, which could hinder their problem-solving abilities. Unlike earlier studies that reported less pronounced differences in mental well-being (Broidy & Agnew, 1997), this study emphasizes gender-specific variations in cognitive functioning and self-generated thought patterns that influence problem solving and mental well-being.

Contrary to some prior studies, no significant differences were observed between students from nuclear and joint family systems across the variables of cognitive functioning, self-generated thoughts, problem-solving, and mental well-being. Previous literature suggested that joint family systems might impose additional stress due to interpersonal conflicts and reduced autonomy (Lee et al., 2010). However, the current findings suggest that family system dynamics may not directly influence cognitive and emotional outcomes among university students. This discrepancy might be attributed to changing societal norms or the shared academic pressures faced by students irrespective of family structure.

The findings also revealed significant differences between emerging adults (younger students) and established adults (older students) across all study variables. Established adults scored significantly higher on cognitive functioning, positive constructive daydreaming, problem-solving, and mental well-being. On the other hand, emerging adults reported higher

frequency of guilt and fear of failure daydreaming and poor attentional control as compared to the other groups.

The extracted outcomes indicate that there are developmental differences in genres of cognition and emotional frameworks. Experiential knowledge evolved schemas to manage stressors, resilience enables older students to better able to adapt cognitively and psychologically. On the other hand, emerging adults may have poor attentional control and are likely to react with guilt and or fear compared to the other group that might be due to the likelihood of undergoing transitional phase that they are in life, entailing academic challenges and the possibility of an ambiguous future.

The results are also in line with the study of Galambos et al. (2006) mentioning that the stress level of the older adults is least because of the ability to apply cognitive coping strategies. These patterns are also consistent with other empirical studies that pointing out that established adults are likely to possess better mental wellbeing than emerging adults due to the problems solving experiences they have acquired.

To assess discrepancies in CF, dimensions of SGTs, PS and MWB of students belonging to different marital groups and education levels one-way analyses of variance (ANOVA) was used. Using post hoc analyses pair-wise discrepancies are highlighted.

The results indicate a significant difference in cognitive functioning between unmarried and married students ($p < .001$), with married students scoring higher. A significant difference was also observed between engaged and unmarried students ($p < .05$), favoring engaged students. However, no significant difference was found between engaged and married students ($p > .05$). No significant differences were observed across marital status groups for positive constructive daydreaming ($p>.05$). There was a significant difference between unmarried and married students ($p < .001$), with unmarried students reporting higher

scores. No significant differences were observed between engaged and unmarried students ($p > .05$) or between engaged and married students ($p > .05$). The analysis revealed a significant difference in poor attentional control between unmarried and married students ($p < .001$), with unmarried students reporting higher scores. Differences between engaged and unmarried students approached significance ($p = .055$), while no significant differences were found between engaged and married students ($p > .05$). Significant differences in problem-solving scores were observed across groups. Married students scored significantly higher than both unmarried ($p < .001$) and engaged students ($p = .074$). Engaged students also scored significantly higher than unmarried students ($p < .01$). Married students demonstrated significantly higher mental well-being than both unmarried ($p < .001$) and engaged students ($p = .098$). Additionally, engaged students reported significantly higher well-being than unmarried students ($p < .01$).

The findings underscore the significant role of marital status in shaping cognitive functioning, self-generated thoughts, problem-solving, and mental well-being among university students. Married students consistently display adaptive cognitive and emotional outcomes, which may be attributed to the stability, support, and shared responsibilities associated with marriage. These results align with prior research emphasizing the psychological and cognitive benefits of marriage, particularly in young adulthood. Unmarried students exhibited higher maladaptive thought patterns, such as guilt and fear of failure daydreaming and poor attentional control. This may stem from transitional stressors, societal expectations, or limited support systems. Engaged students showed intermediate outcomes, reflecting their transitional position between singlehood and marriage. This study highlights the nuanced interplay between marital status and cognitive-emotional processes, offering insights for targeted interventions to support unmarried and engaged students in enhancing their cognitive functioning and mental well-being.

To examine differences across educational levels (undergraduate, graduate, and postgraduate) in cognitive functioning, self-generated thoughts, problem-solving, and mental well-being, one-way ANOVA and post hoc analyses were conducted. Significant differences were observed across all educational groups ($p < .001$). Graduate and postgraduate students scored significantly higher in cognitive functioning compared to undergraduate students, with no significant difference between graduate and postgraduate students ($p>.05$). This indicates that higher education levels are associated with improved cognitive functioning, possibly due to the greater academic and cognitive demands placed on students at these stages, which enhance cognitive skills over time. The results for positive constructive daydreaming revealed elevated constructed daydreams in graduate students as compared to undergraduate students ($p<.001$) and postgraduates ($p>.05$). Undergraduate and postgraduate students reported no substantial differences ($p>.05$). This implies that during graduate studies, students may engage more in adaptive daydreaming to cope with academic challenges, which might decline as responsibilities and pressures increase at the postgraduate level. Undergraduate students had higher mean scores of guilt and fear of failure daydreaming compared to graduate and post-graduate students ($p<.001$), However, there was no substantial disparity between graduate and post-graduate groups ($p >.05$) was noted. These outcomes signify that there might be a positive correlation between education level and self-critical thoughts, possibly because of reduced progressing self-coping strategies and the lack of certainty regarding future prospectives and career aspirations. Undergraduate students reported higher mean scores than graduate and postgraduate students with statistically significant differences ($p < .001$). There was no statistical difference between the graduates and postgraduates on the total mean scores ($p>.05$). The increase in attentional control in higher education levels could be explained by the fact that there is a surging required level of attention needed for performing progressive academic activities. Substantial differences were observed for

graduate and postgraduate groups as compared to undergraduate groups for problem solving ($p<.001$). On the other hand, there were no significant differences between graduate and post-graduate groups ($p >.05$). This is in agreement with the literary works that propose that advanced education levels increase the problem solving skills, most probably because complex and analytical tasks are more prevalent in higher education. Furthermore, the results also reveal that graduate and postgraduate students had a higher level of mental well-being than the undergraduate students ($p < .001$), while the differences in the two former groups were not significant ($p > .05$). This suggests that heightened mental well-being is achieved because people who are in higher level of education have an elevated sense of purpose and achievement, have more developed coping strategies and boosting self-confidence hence reducing negative thinking.

Outcomes obtained disclosed the relationship between the level of education and the overall cognitive abilities, self-generated thoughts, and problem-solving skills, as well as mental wellbeing. Students in undergraduate levels may encounter more academic obstacles, as well as dysfunctional emotional experiences due to changing environment that impedes their abilities and general performance. Graduate and postgraduate students on the other hand have higher cognitive and emotional capacity from advanced cognitive and emotional skills, likely cultivated through their academic experiences. These findings have implications for the need to promote interventions to aid cultivate attention regulation and minimizing the frequency of dysfunctional daydreaming among undergraduates to help students achieve better mental wellbeing.

5.2. Conclusion

The current research makes a theoretical contribution in that it offers a revised perspective on how cognitive functioning, and self-generated thoughts, can forecast problem solving and

mental wellbeing among university students. Obtained insights firmly backed by the literature propose that cognitive resources and modes of thinking govern student's coping and non-coping responses to academic and personal demands, hence calling for attempts to enhance cognition and eradicate deleterious SGTs. These outcomes reveal the importance of attentional control and constructive daydreaming to improve psychological adjustments and psychological coping capacities.

The outcomes simultaneously supply knowledge about the role of cognitive and emotional factors in students' well-being. Additional studies are needed to enrich these insights and provide strategies for boosting cognitive and affective resources. In more detail, the study aimed to a novel perspective at the interactivity that exists between cognitive functioning and thought processes in university settings.

The findings of this research should be extended across varied samples and settings, and by employing longitudinal designs in order to assess the cumulative impact of cognitive functioning and modes of thinking on mental wellbeing. The objective is to counsel the creation of initiatives meant to improve attentional control, promoting adaptive self-generated thoughts, and ultimately supporting students in achieving enhanced psychological adjustment and well-being.

5.3 Limitations and Recommendations

Certain limitations are susceptible to the study that have to be discussed to promote further better development of modern research: First, extraneous variables that might have interacted with the outcomes entailing sleep quality, physical health and social support, factors likely to affect cognitive functioning and mental well-being remain unaccounted when carrying out the analysis. These factors could work in moderation or as moderators of the relationships of interest in the study and their exclusion might distort the broadened

perspective of the outcomes. As such, future research should capture these variables to enhance an understanding of how different aspects of a person's environment and behavioral patterns influence the degree of cognition and well-being.

Additional drawbacks emerge by the application of self-report measures that are suitable for survey type of research but may be tainted by social desirability bias. This might have skewed the results, respondents might have altered their answers with intention or without realizing for socially acceptability, to this the following suggestion is recommended for future researchers: namely, to include behavioral observations, neurocognitive testing, or physiological testing. Such measures can offer more detailed and accurate data and can make self-reports more reliable.

Moreover, the current study recruited only 400 participants, which even though sufficient for statistically comparing the study variables might not sufficiently represent the heterogeneous population of university students. Therefore, multitude samples encompassing different ethnicity, gender, age, academic discipline, and geographic location should be captured in future research to offer enhanced exploration of the subgroup differences and an effective provision of an all-embracing understanding of the phenomena under discussion.

Therefore, minimizing these limitations in prospective studies by the inclusion of potential confounding variable, the use of objective measures, and a larger sample size will strengthen the reliability, accuracy, and generality of the findings. Consequently, future work can forge on the current research to establish new measures to enhance cognitive function and mental wellbeing among university students.

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Appendix A: Informed Consent Form

Informed Consent Form

Dear Participant,

Your participation is requested in the following research 'Cognitive Phenomenon and Mental Well-Being among university students' going to be conducted by National University of Moden Languages, Islamabad. Your participation is crucial, and I would truly appreciate your contribution, as it will add immense value to the existing body of knowledge in this domain. Your involvement is highly valued and will undoubtedly make a meaningful impact on the outcomes of research. Please read carefully and provide your information.

I confirm that (Please tick the box as appropriate).

1	I have read and understood information about the research.	
2	I have been allowed to ask questions about my participation.	
3	I Voluntarily agree to participate in the research.	
4	I understand I can withdraw at any time without giving reasons and that I will not be penalized for withdrawing nor will I be questioned on why I have withdrawn.	
5	The procedures regarding confidentiality have been clearly explained.	
8	I, agree to sign and date this informed consent form.	

Signature ---------- Date ----------

Demographic Sheet

Age _____

Gender _____

Birth Order (Your number in siblings) _____

Marital Status _____

Family System (Joint/ Separate) _____

Education _____

Appendix B

Cognitive Functioning Self-Assessment Scale (CFSS)

Instructions

Here as follows is a list of statements. Please read each one and mark with an **X** the column that appears most appropriate to you. In selecting your option on the scale, please keep in mind what happened **in the last 12 months**

	Never	**Almost never**	**Some-times**	**Almost always**	**Always**
1). I find it difficult to concentrate.	5	4	3	2	1
2). I get easily absent-minded.	5	4	3	2	1
3). I find it difficult to do two things at a time, even simple things (Ex: when I am talking while making tea, I might forget to put water in the teapot, or I must stop the conversation)	5	4	3	2	1
4). I find it difficult to make mental. calculations (Ex: cannot mentally calculate the rest when shopping).	5	4	3	2	1
5). I don't find any difficulty in speaking.	5	4	3	2	1
6). I get absent-minded in the middle of an activity.	5	4	3	2	1
7). I find it difficult to organize extra routine activities (Ex: a vacation or a dinner with several people.	5	4	3	2	1
8).I find it difficult to remember recent information. (Ex: a person's name, the name of a place or a product, a phone number).	5	4	3	2	1
9). I find it difficult to remember information I once knew well (Ex: the dates of historical events, and geographic locations).	5	4	3	2	1
10). I find it difficult to remember episodes or events that happened just a few days ago (Ex: I do not remember how I spent yesterday afternoon or who I met on the street).	5	4	3	2	1
11). I leave objects that I should have taken with me, and, because of this, I must go back for them (Ex: the trash ready by the door or my lunch bag when I go to work).	5	4	3	2	1

	Never	**Almost never**	**Some-times**	**Almost always**	**Always**
12). When reading (magazines, books, etc.), I need to go over the last lines again in search of important information to follow the passage (Ex: the name of a character).	5	4	3	2	1
13). My movements are not well coordinated.	5	4	3	2	1
14). I have the feeling that my movements are slowed down/somewhat sluggish or slower than usual.	5	4	3	2	1
15). While speaking, I cannot find the right words at the right time.	5	4	3	2	1
16). While speaking, I cannot find the right words, but to get my point across, I use instead explanations or generic words (Ex: pass me that thing).	5	4	3	2	1
17). It is difficult for me to find my way around in reaching a place/destination.	5	4	3	2	1
18). I get confused with dates, and I cannot remember what date it is today	5	4	3	2	1

Appendix C
Short Imaginal Process Inventory (SIPI)
Instructions

Indicate to what extent each statement **applies to you**, or is **true for you**, by marking them with an **X** in the space to the right of each item.

	Very true or Strongly characteristic of me	**Moderately true or Characteristic of me**	**Neither Particularly characteristic nor Uncharacteristic of me**	**Moderately untrue or Uncharacteristic of me**	**Definitely untrue or Strongly uncharacteristic of me**
1). I tend to be quite wrapped up (deeply involved or absorbed) and interested in whatever I am doing.	5	4	3	2	1
2). A really original idea can sometimes develop from a really fantastic daydream (imagination).	5	4	3	2	1
3). In my fantasies, a friend discovers that I have lied.	5	4	3	2	1
4). I do not really "see" the objects in a daydream (engaging in spontaneous and imaginative thoughts).	5	4	3	2	1
5). I am the kind of person whose thoughts often wander (thoughts frequently divert or move from one topic to another).	5	4	3	2	1
6). In my daydreams, I see myself as an expert, whose opinion is sought by all (highly valued).	5	4	3	2	1

	Very true or Strongly characteristic of me	**Moderately true or Characteristic of me**	**Neither particularly characteristic nor Uncharacteristic of me**	**Moderately untrue or Uncharacteristic of me**	**Definitely untrue or Strongly uncharacteristic of me**
7). Sometimes an answer to a difficult problem will come to me during a daydream.	5	4	3	2	1
8). My mind hardly loses focus from the work I am doing.	5	4	3	2	1
9). I imagine myself failing those I love.	5	4	3	2	1
10). I picture myself as I will be several years from now.	5	4	3	2	1
11). I find that I easily lose interest in things that I have to do.	5	4	3	2	1
12). My daydreams often contain depressing events which upset me.	5	4	3	2	1
13). I am not easily distracted.	5	4	3	2	1
14). In my daydreams, I show my anger towards my enemies.	5	4	3	2	1
15). My fantasies (imaginations) give me pleasant thoughts.	5	4	3	2	1
16). My concentration (focusing) ability is not disturbed by someone talking in another part of my house or apartment.	5	4	3	2	1
17). The sounds I hear in my daydreams are clear and distinct.	5	4	3	2	1

	Very true or Strongly characteristic of me	**Moderately true or Characteristic of me**	**Neither particularly characteristic nor Uncharacteristic of me**	**Moderately untrue or Uncharacteristic of me**	**Definitely untrue or Strongly uncharacteristic of me**
18). I imagine myself that. I am unable to complete a task which I have to do.	5	4	3	2	1
19). Daydreaming never solves any problems.	5	4	3	2	1
20). No matter how hard I try to concentrate, thoughts unrelated to my work always creep in (interrupt).	5	4	3	2	1
21). In my daydreams, I am afraid of doing something wrong.	5	4	3	2	1
22). My daydreams are often stimulating (exciting and fulfilling) and rewarding.	5	4	3	2	1
23). I can work at something for a long time without feeling the least bit bored or restless.	5	4	3	2	1
24). In my daydreams, I often become angry.	5	4	3	2	1
25). Faced with a tedious (boring) job, I notice all the other things that I could be doing.	5	4	3	2	1
26). I hardly (less often) think about what I will be doing in the future.	5	4	3	2	1

	Very true or Strongly characteristic of me	**Moderately true or Characteristic of me**	**Neither particularly characteristic nor Uncharacteristic of me**	**Moderately untrue or Uncharacteristic of me**	**Definitely untrue or Strongly uncharacteristic of me**
27). I imagine receiving an award in front of a big audience.	5	4	3	2	1
28). My daydreams (imaginations) offer me useful clues to tricky situations I face.	5	4	3	2	1
29). I tend to be easily bored.	5	4	3	2	1
30). Unpleasant daydreams don't frighten or bother me.	5	4	3	2	1
31). The "pictures in my mind" seem as clear as photographs.	5	4	3	2	1
32). In my daydreams, I fear meeting new responsibilities in life.	5	4	3	2	1
33). I find it hard to read when someone is on the telephone in a neighboring room.	5	4	3	2	1
34). I find myself imaging ways of getting even (retaliate or seek revenge) with those I dislike.	5	4	3	2	1
35). I hardly (less often) feel bored.	5	4	3	2	1
36). My daydreams often leave me with a warm, happy feeling.	5	4	3	2	1
37). I imagine myself in an organization as a successful individual.	5	4	3	2	1
38). Daydreams do not have any practical significance for me.	5	4	3	2	1

	Very true or Strongly characteristic of me	**Moderately true or Characteristic of me**	**Neither particularly characteristic nor Uncharacteristic of me**	**Moderately untrue or Uncharacteristic of me**	**Definitely untrue or Strongly uncharacteristic of me**
39). I find it difficult to concentrate when the TV or radio is on.	5	4	3	2	1
40). I daydream about what I would like to see happen in the future.	5	4	3	2	1
41). In my daydreams, I feel guilty for having escaped punishment.	5	4	3	2	1
42). My thoughts <u>hardly</u> (less often) divert from objects in front of me.	5	4	3	2	1
43). I find my daydreams are worthwhile and interesting to me.	5	4	3	2	1
44). I never panic as a result of a daydream.	5	4	3	2	1
45). I have difficulty in maintaining concentration for long periods of time.	5	4	3	2	1

Appendix D

Problem Solving Inventory (PSI)

Instructions

Indicate to what extent each statement **applies to you**, or is **true for you**, by marking them with an **X** in the space to the right of each item.

	Strongly disagree	**Moderately disagree**	**Slightly disagree**	**Slightly agree**	**Moderately agree**	**Strongly agree**
1). When a solution to a problem has failed, I do not examine why it didn't work.	1	2	3	4	5	6
2). When I face a complex problem, I don't take the time to develop a strategy for collecting information that will help define the nature of the problem.	1	2	3	4	5	6
3). When my first efforts to solve a problem fail, I become uneasy about my ability to handle the situation.	1	2	3	4	5	6
4). After I solve a problem, I do not analyze what went right and what went wrong.	1	2	3	4	5	6
5). I am usually able to think of creative and effective alternatives to my problems.	1	2	3	4	5	6
6). After following a course of action to solve a problem, I compare the actual outcome with the one I had anticipated (expected or predicted)	1	2	3	4	5	6
7). When I have a problem, I think of as many possible ways to handle it as I can until I can't come up with any more ideas.	1	2	3	4	5	6

	Strongly disagree	**Moderately disagree**	**Slightly disagree**	**Slightly agree**	**Moderately agree**	**Strongly agree**
8). When confronted with a problem, I consistently examine my feelings to find out what is going on in a problem situation.	1	2	3	4	5	6
9). When confused about a problem, I don't clarify vague (unclear) ideas or feelings by thinking of them in concrete terms.	1	2	3	4	5	6
10). I have the ability to solve most problems even though initially no solution is immediately apparent.	1	2	3	4	5	6
11). Many of the problems I face are too complex for me to solve.	1	2	3	4	5	6
12). When solving a problem, I make decisions that I am happy with later.	1	2	3	4	5	6
13). When confronted with a problem, I tend to do the first thing that I can think of to solve it.	1	2	3	4	5	6
14). Sometimes I do not stop and take time to deal with my problems, but just kind of procced or move ahead.	1	2	3	4	5	6
15). When considering solutions to a problem, I do not take the time to assess the potential success of each alternative.	1	2	3	4	5	6
16). When confronted with a problem, I stop and think about it before deciding on a next step.	1	2	3	4	5	6
17). I generally act on the first idea that comes to mind in solving a problem.	1	2	3	4	5	6
18). When making a decision, I compare alternatives and weigh the results of one against the other.	1	2	3	4	5	6

	Strongly disagree	**Moderately disagree**	**Slightly disagree**	**Slightly agree**	**Moderately agree**	**Strongly agree**
19). When I make plans to solve a problem, I am almost certain that I can make them work.	1	2	3	4	5	6
20). I try to predict the result of a particular course of action.	1	2	3	4	5	6
21). When I try to think of possible solutions to a problem, I do not come up with very many alternatives.	1	2	3	4	5	6
22). When trying to solve a problem, one strategy I often use is to think of past problems that have been similar.	1	2	3	4	5	6
23). Given enough time and effort, I believe I can solve most problems that confront me.	1	2	3	4	5	6
24). When faced with a new or unique situation, I have confidence that I can handle problems that may arise.	1	2	3	4	5	6
25). Despite my efforts to solve a problem, I occasionally feel unsure or lost, unable to pinpoint the real issue.	1	2	3	4	5	6
26). I make snap (quick and impulsive) judgments and later regret them.	1	2	3	4	5	6
27). I trust my ability to solve new and difficult problems.	1	2	3	4	5	6
28). I use a systematic method to compare alternatives and make decisions.	1	2	3	4	5	6
29). When thinking of ways to handle a problem, I less often (hardly) combine ideas from various alternatives to arrive at a workable solution.	1	2	3	4	5	6

	Strongly disagree	**Moderately disagree**	**Slightly disagree**	**Slightly agree**	**Moderately agree**	**Strongly agree**
30). When faced with a problem, I hardly (less often) look for external factors that may cause the problem.	1	2	3	4	5	6
31). When confronted with a problem, I usually first survey the situation to determine the relevant information.	1	2	3	4	5	6
32). Sometimes, I become so emotional that my feelings makes it hard for me to see other ways to solve a problem.	1	2	3	4	5	6
33). After making a decision, the actual outcome is usually similar to what I had anticipated.	1	2	3	4	5	6
34). When faced with a problem, I am unsure of whether I can handle the situation.	1	2	3	4	5	6
35). When I become aware of a problem, one of the first things I do is try to find out exactly what the problem is.	1	2	3	4	5	6

Appendix E

Warwick Edinburgh Mental Wellbeing Scale (WEMBS)

Instructions

Below are some statements please **tick the box** that best describes your **experience of each over the last 2 weeks**

STATEMENTS	**None of the time**	**Rarely**	**Some of the time**	**Often**	**All of the time**
1) I've been feeling optimistic about the future.	1	2	3	4	5
2) I've been feeling useful.	1	2	3	4	5
3) I've been feeling relaxed.	1	2	3	4	5
4) I've been feeling interested in other people.	1	2	3	4	5
5) I've had energy to spare.	1	2	3	4	5
6) I've been dealing with problems well.	1	2	3	4	5
7) I've been thinking clearly.	1	2	3	4	5
8) I've been feeling good about myself.	1	2	3	4	5
9) I've been feeling close to other people.	1	2	3	4	5
10) I've been feeling confident.	1	2	3	4	5
11) I've been able to make up my own mind about things.	1	2	3	4	5
12) I've been feeling loved.	1	2	3	4	5
13) I've been interested in new things.	1	2	3	4	5
14) I've been feeling cheerful.	1	2	3	4	5

Appendix F

Permission to Use Cognitive Functioning Self-Assessment Scale

Gmail

Fatima Syed <fatimh043@gmail.com>

PERMISSION FOR CFSS

3 messages

Fatima Syed <fatimh043@gmail.com> 28 November 2023 at 18:21
To: annunziata@cro.it

Hey there ma'am
I am a student of NUML Islamabad (Pakistan) and I am doing my M.PHIL research on Cognitive Functioning in university students .For this purpose i would like to use your tool in english version i.e Cognitive Functioning Self Assessment Scale. I will be very grateful to you if you provide me with the tool, allow me to use it and give the scoring manual as well. Your response is awaited. Thank You :)

Annunziata Maria Antonietta <annunziata@cro.it> 29 November 2023 at 12:39
To: Fatima Syed <fatimh043@gmail.com>

Dear Fatima,

Please find attached the questionnaire and the two articles where you can find the rules for interpreting the results.

Good work and best regards

M. Antonietta Annunziata

Da: Fatima Syed <fatimh043@gmail.com>
Inviato: martedì 28 novembre 2023 14:22
A: Annunziata Maria Antonietta <annunziata@cro.it>
Oggetto: PERMISSION FOR CFSS

Appendix G

Permission to Use Short Imaginal Processes Inventory

PERMISSION FOR SIPI
3 messages

Fatima Syed <fatimh043@gmail.com> Sun, 10 Mar 2024 at 1:15 PM
To: anshnsl@ucla.edu

Hey there MA'AM
I am a student at NUML Islamabad (Pakistan) and I am doing my M.PHIL research on SELF-GENERATED THOUGHTS in university students. For this purpose, I would like to use your tool in English version i.e. SHORT IMAGINAL PROCESS INVENTORY. I will be very grateful to you if you provide me with the tool, allow me to use it, and give me the scoring manual as well. Your response is awaited. Thank you.

Fatima Syed <fatimh043@gmail.com> Wed, 13 Mar 2024 at 7:43 PM
To: anshnsl@ucla.edu

Hey there MA'AM
I am a student at NUML Islamabad (Pakistan) and I am doing my M.PHIL research on SELF-GENERATED THOUGHTS in university students. For this purpose, I would like to use your tool in English version i.e. SHORT IMAGINAL PROCESS INVENTORY. I will be very grateful to you if you provide me with the tool, allow me to use it, and give me the scoring manual as well. Your response is awaited. Thank you.

[Quoted text hidden]

Gay Meixel <gay_meixel@hotmail.com> Thu, 28 Mar 2024 at 6:07 PM
To: fatimh043@gmail.com <fatimh043@gmail.com>

Fatima Syed,

My mother, Professor Carol S. Aneshensel died June 14, 2019.

I am the executor and trustee of Carol S. Aneshensel's estate. On behalf of Carol S. Aneshensel, I grant you the permission you request.

Below are additional citations to publications that seem relevant to your request. You might try searching online for access to these publications; please notice that they were published before the internet existed. You might try visiting a college or university library and the librarian might have ideas as to how you could obtain access to the publications.

George J. Huba, Carol S. Aneshensel & Jerome L. Singer (1981) Development Of Scales For Three Second-Order Factors Of Inner Experience, Multivariate Behavioral Research, 16:2, 181-206, DOI: 10.1207/s15327906mbr1602_4

Appendix H

Permission to Use Problem Solving Inventory

6/15/25, 11:25 AM Gmail - Permission to use Problem-Solving Inventory

Gmail

Fatima Syed <fatimh043@gmail.com>

Permission to use Problem-Solving Inventory

2 messages

Fatima Syed <fatimh043@gmail.com> 3 December 2024 at 18:53
To: heppnerp@missouri.edu

Respected Sir
I am a NUML Islamabad (Pakistan) student and doing my M.PHIL research on Problem-Solving abilities of university students. For this purpose, I would like to use your tool in English, i.e., Problem-Solving Inventory. I will be very grateful if you permit me to use the tool for my research. Your response is highly awaited. Thank You :)

Heppner, Puncky <heppnerp@missouri.edu> 4 December 2024 at 08:33
To: Fatima Syed <fatimh043@gmail.com>

Fatima, yes, you may use the PSI in your research. Do you need a copy of the PSI? I will attach the PSI, along with scoring instructions. Let me know if you need anything else.
All the best, Puncky

Puncky Paul Heppner, Ph.D.
MU Distinguished Curators' Professor Emeritus
Past President of Counseling Psychology (Div. 17) of the APA

From: Fatima Syed <fatimh043@gmail.com>
Sent: Tuesday, December 3, 2024 6:53 AM
To: Heppner, Puncky <heppnerp@missouri.edu>
Subject: Permission to use Problem-Solving Inventory

WARNING: This message has originated from an External Source. This may be a phishing expedition that can result in unauthorized access to our IT System. Please use proper judgment and caution when opening attachments, clicking links, or responding to this email.

[Quoted text hidden]

Appendix I

Permission to Use Warwick Edinburgh Mental Wellbeing Scale

Gmail

Fatima Syed <fatimh043@gmail.com>

Submission (ID: 619178021) receipt for the submission of /fac/sci/med/research/platform/wemwbs/using/non-commercial-licence-registration

1 message

no-reply@warwick.ac.uk <no-reply@warwick.ac.uk> 5 December 2024 at 10:14
To: fatimh043@gmail.com

Thank you for completing the registration for a Licence to use WEMWBS for non-commercial purposes.
You now have access to the scales and the associated resources here on our website: https://warwick.ac.uk/wemwbs/using/register/resources
We suggest you bookmark this page for future reference.
The information declared on your Registration Form is documented below. Please retain a copy of this email as a record of your Licence together with the Terms and Conditions you have accepted.
If you have any questions please contact us via email: wemwbslicence@warwick.ac.uk

Question: Type of use
Answer:
Survey

Question: type of use other