RELATIONSHIP BETWEEN CONNECTEDNESS WITH NATURE, COGNITIVE FLEXIBILITY, SPIRITUALITY AND MALADAPTIVE DAYDREAMING AMONG UNIVERSITY STUDENT

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DECLARATION

I, Ms. Nudrat Ejaz, Registration No. **343-FSS/MSEP/F23** student of **MS** in the subject of Psychology, session **2023-2025**, hereby declare that the matter printed in the thesis titled: Relationship between Connectedness with Nature, Cognitive Flexibility, Spirituality and Maladaptive Daydreaming Among University Students is my own work and has not been printed, published, and submitted as research work, thesis or publication in any form in any University, Research Institution etc. in Pakistan or abroad.

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Signature of Deponent

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Dedication

To my beloved parents

Whose unwavering support and sacrifices have fuelled my academic journey. Your love is the

Cornerstone of my success, and I am profoundly grateful for everything.

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List of Abbreviation

CN	Connectedness with Nature
CF	Cognitive Flexibility
SP	Spirituality Measurement
MLD	Maladaptive Daydreaming

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Abstract

The purpose of the current study is to determine the extent to which university students' maladaptive daydreaming, spirituality, cognitive flexibility, and connection to nature are related. There were 200 university students in the sample, ages 18 to 25 (114 men and 86 women). The link between spirituality, cognitive flexibility, attachment to nature, and maladaptive daydreaming has been investigated using a quantitative survey research approach. Data has been gathered using the Connectedness with Nature Scale (CNS) (Mayer & Frantz., 2004), the Maladaptive Daydreaming Scale (MDS) (Somer et al., 2017), the Spirituality Measurement Scale (SMS) (Makkah & Singh, 2018), and the Cognitive Flexibility Inventory (CFI) (Debbis & Vander Wal, 2010). The findings showed that whereas maladaptive daydreaming had a negative link with spirituality and cognitive flexibility, connectedness to nature had a good correlation with both. Mediation study indicated that Spirituality fully mediated the association between Connectedness with Nature and Cognitive Flexibility, implying that people who are more connected to nature acquire more spiritual awareness, which improves cognitive flexibility. Furthermore, moderation analysis found that Maladaptive Daydreaming considerably reduced the favorable association between Connectedness to Nature and Cognitive Flexibility. Overall, the findings highlight that spirituality acts as a psychological bridge transforming the restorative influence of nature into improved cognitive functioning, whereas maladaptive daydreaming impedes this adaptive

process. Gender-based analysis indicated that female students reported higher spirituality and maladaptive daydreaming, whereas male students exhibited greater cognitive flexibility. Undergraduate students showed stronger connectedness to nature compared to postgraduate students, suggesting greater emotional and environmental awareness among younger participants. Moreover, individuals belonging to joint families demonstrated higher spirituality and connectedness to nature, while those from nuclear families showed relatively more cognitive flexibility.

*Keyword***:** *connectedness with nature, cognitive flexibility, spirituality, maladaptive daydreaming*

Chapter 1

Introduction

In today's fast-paced academic environment, university students are increasingly disconnected from the natural world a shift that coincides with rising levels of stress, anxiety, and cognitive overload. As digital immersion and urban lifestyles dominate student routines, opportunities for meaningful engagement with nature have diminished, potentially undermining psychological resilience and emotional regulation. This disconnection may also affect students' ability to adapt cognitively to complex academic and social demands. At the same time, spiritual awareness often sidelined in modern educational discourse can serve as a grounding force, fostering inner clarity and purpose. Yet, when students turn inward through excessive and uncontrolled daydreaming, this coping mechanism may become maladaptive, interfering with their academic functioning and mental flexibility. These intersecting dynamics call for a deeper exploration of how nature connectedness, spirituality, cognitive flexibility, and maladaptive daydreaming shape the psychological landscape of university students in Pakistan. In the realm of psychological inquiry, the exploration of human behavior and mental adaptability has increasingly emphasized the role of environmental and internal factors in shaping cognitive and emotional outcomes (Mayer & Frantz, 2004).

Connectedness to Nature

Connectedness to nature refers to a person's sense of connection with and belonging to the natural environment (Mayer & Frantz, 2004; Pritchard et al., 2019). It is a consistent personality characteristic in various contexts and over time (Nisbet et al., 2011). Furthermore, it can be a state that varies depending on one's interactions with nature, activities in or related to nature, and time spent in nature (Vining et al., 2008; Richardson et al., 2016). According to Cervinka et al. (2012), having a connection to nature is important for good health conditions.

The broad interdisciplinary concept of connectedness to nature captures the extent to which people perceive nature inside a cognitive representation of the self (Schultz, 2002) and feel a part of nature (Mayer & Frantz, 2004). Biophilia, inclusion, and relatedness are terms used to describe our connection to nature in a variety of similar but distinct ways (Beery & Watz, 2014). Concern about the repercussions of a lessened human experience with nature is one of the reasons for the vast range of sophisticated definitions and methods used to assess Connectedness to Nature (Louv 2005; Pyle 1993; Soga & Gaston 2016, 2021).

Affective, cognitive, and psychomotor learning are among the issues raised by the loss of educational opportunities (Gaston & Soga 2020; Ives et al. 2018; Genc, & Rasgele 2018; Lim et al. 2017). Another issue is a lack of opportunity to promote pro-environmental attitudes and behaviors (Schultz, 2002; Mayer & Frantz 2004; Mayer et al. 2009; Davis, Green, & Reed 2009; Restall & Conrad 2015; Barragan-Jason et al. 2023).

Concerns and consequences about the possible loss of significant human-nature interaction have led to a wide range of research on the importance and possibilities of a conscious pursuit of Connectedness to Nature (Barragan-Jason et al. 2022, 2023; Barrable 2019; Zylstra et al. 2014; Nisbet & Zelenski 2011). This evidence suggests that a condition of being connected to nature can be intentionally pursued through a range of strategies, including teaching outside of the classroom (Waite, 2009), specialized pedagogies (Barrable, 2019), and direct intervention (Richardson & Butler, 2022). Additionally, childhood is emphasized as a critical period for the deliberate pursuit of connectedness to nature (Beery et al. 2020; Price et al. 2022; Richardson et al. 2016; Wells & Lekies, 2006), given concerns for children's development and well-being as well as the possibility that childhood connectedness to nature will correlate with connectedness to nature throughout one's lifespan (Chawla, 2020; Mygind et al. 2019; Rosa, Profice, & Collado, 2018; Wells & Lekies, 2006).

Anthropologists frequently observe that native peoples have the view that we all share a place in the natural world. More recently, the ideas of embodied cognition and extended mind which view the mind and environment as a single, interconnected system have emerged (e.g. Clark, 1997; Gallagher, 2005; Lakoff & Johnson, 1999). (For instance, Jacob, 2012; Borghi & Cimatti, 2010) These psychological and philosophical factors firmly ingrain us in our surroundings. Others are emphasizing the connection between the sciences of mind, phenomenology, and biology (Thompson, 2010).

Our perceptual system allows us to access the world through these sensations. Furthermore, it has been suggested that the fluency of such perception that is, how easily we observe nature supports both the aesthetics of its beauty (Reber et al., 2004) and the therapeutic benefits of nature (e.g., Attention Restoration Theory). These feelings are the moments when humans and nature interact; they are moments of connectivity that result from the way we, as biological beings, interpret the environment (Richardson, 2014).

A lot of research has been done on the experience of nature connectedness as a tool to assist change individual behaviors. In fact, nature connectedness is associated with both well-being and ecologically friendly, pro-conservation behaviors (Barragan-Jason et al., 2023). Positive interactions with nature, teaching about the natural world, and motivating people to value nature in their life are all ways to promote nature connectivity (Sheffield et al., 2022).

However, natural connectivity is still a vague and poorly defined concept that can relate to a variety of conceptions of attachment to particular locations, personal experiences, or individual psychological characteristics (Ives et al., 2017).

The concept of connectedness to nature closely relates to spirituality, as both involve a profound sense of unity, meaning and belonging beyond the self. Experiencing connection

with the natural world often evokes feelings of awe, gratitude and transcendence elements that are also central to spiritual experiences. Nature can serve as a pathway for spiritual awareness by fostering reflection, mindfulness and a sense of harmony with life. Therefore, individuals who feel deeply connected to nature may also exhibit higher levels of spirituality, as both constructs emphasize interconnectedness, purpose and appreciation of existence beyond the material world.

Spirituality

Spirituality can mean different things to different people. Some people's primary concerns are their belief in God and their active participation in organized religion. Others concentrate on nonreligious activities that allow them to engage with their spiritual selves, such as silent introspection, yoga, meditation, private prayer, or time spent in nature. According to Flower (2004), spiritual experiences are transcendent states or altered states of consciousness that beyond commonplace or everyday experiences. Spirituality, which is defined as a person's beliefs and subjective experiences that provide a sense of transcendence beyond what is material in the here and now, is influenced by spiritual experiences (Kamitsis & Francis, 2013). Nature events involving water, trees, flowers, spring, dawn, and sunset are frequently the source of spiritual experiences (Laski, 2016).

Spirituality is widely understood as an inner, personal search for meaning, purpose, and connection that extends beyond material existence. Rather than being limited to formal religious practices, spirituality reflects an individual’s efforts to cultivate inner peace, self-awareness, and a sense of harmony with the world. Even among individuals who do not believe in any good, spirituality is a trait that transcends any affiliation and aims to inspire, venerate, wonder, meaning, and purpose. The spiritual dimension essentially comes into

emphasis at periods of emotional stress, physical (and mental) disease, loss, grief, and death. It also seeks answers concerning the infinite and aims to be in harmony with the universe (Murray & Zentner, 1989).

In the context of six basic human relationships 1) to God or whatever is considered ultimate reality, 2) to oneself, 3) to others, 4) to the environment, 5) to the past, and 6) to the future .Spirituality is defined as a belief or value system that permeates every aspect of a person's life and gives it meaning, according to Hoshiko (1994). Spirituality is the energy that may bring the body, mind, and soul into internal harmony. In order to promote inner healing and well-being, internally directed energy can be utilized creatively to create harmony, fortify and enhance positive thinking, and activate or strengthen internal defenses (Goddard, 1995).

The way a person views and lives life in light of their ultimate meaning, values, and beliefs is known as their spirituality. When lived purposefully, it is perceived as a process of maturation and progress and serves as the unifying and integrative element of an individual's life. It embodies a sense of the transcendent, unites and animates the entirety of a person's story or narrative, embeds their fundamental identity, establishes the basis for their interactions with others and society, and acts as their lens through which they view the world. Spirituality is the cornerstone of community because it allows us to experience our co-partnership in the shared human condition. Religious categories may or may not be used to express or experience it (Fowler & Peterson, 1997).

One expression of the spiritual bond between people and the environment is ecospirituality. A relational perspective of human to earth, soul to soil, and inner to outside landscape is explored by ecospirituality. The concept of ecospirituality [supports] holistic

nursing practice in the areas of self-care, care for others, and care for the environment (Lincoln, 2000).

According to Seeber et al. (2001), spirituality is the core or center of the human experience, from which all other dimensions derive their ultimate meaning. Four interconnected dimensions make up the personal, interpersonal, and transpersonal context of spirituality (a) belief in universal intelligence or a higher power, which may or may not entail formal religious activities; (b) self-discovery, which is the first step on the spiritual journey and begins with reflection and a search for meaning and purpose (c) relationships a vital connection to people based on a deep respect and reverence for life; (d) eco-awareness, a vital connection to nature based on a deep regard and reverence for the environment and a belief that the Earth is sacred. Spirituality, which may or may not entail religious institutions or customs, is the most common human experience that aims to transcend oneself and discover meaning and purpose by connections with other people, the natural world, and/or a Supreme Being (Delaney, 2005). According to Buck (2006), the four facets of spirituality are seen as dynamically related and interrelated.

There is a sense of the transcendent in spirituality. It addresses ideals that transcend the material world and its self-interested objectives. These are the ideals that people not only preach but also hold in their hearts. Therefore, spirituality is existential, experiential, and reaches each person's innermost being, where they most fully reside Barnum (2011).

Spirituality and cognitive flexibility share a profound connection, as both involve openness, reflection, and adaptability in one's perception and experiences. Spirituality inclined individuals often engage in self-reflection, mindfulness and a broader understanding of life's meaning all of which foster flexible thinking and adaptive coping. Spirituality

encourages individuals to view challenges from multiple perspectives, accept uncertainty and find purpose beyond immediate circumstances. Similarly cognitive flexibility involves the mental ability to shift perspectives, adjust beliefs and generate alternative solutions in response to changing situation. Thus spirituality may enhance cognitive flexibility by promoting open-mindedness inner balance, and the capacity to reinterpret experiences in meaningful ways.

Cognitive Flexibility

"Cognitive flexibility" refers to the ability to envision different possibilities for human behavior and life events, to think of different solutions, and to regard difficult situations as doable. Similarly, Dennis and Vander Wal (2010) described it as the tendency to perceive difficult situations as manageable, the ability to envision multiple possibilities for life events and human behavior, and the ability to provide various solutions.

Cognitive flexibility is one of the most diverse features of the human mind. It involves, among other things, the capacity to move between mental sets and representations, creative problem solving, perspective taking, and original thinking. More cognitive flexibility can help you be more focused, creative, and empathetic, understand, and perform better in many aspects of your life. Additionally, you can develop into a more proficient and effective thinker (Abdullah et al., 2016).

The ability of humans to quickly rearrange our minds is referred to as cognitive flexibility. It, working memory, and inhibition are all included in the executive function category. Our brains' executive functions serve as the control centers, and our capacity for cognitive control is influenced by working memory, inhibition, and cognitive flexibility. Thankfully, studies have demonstrated that executive functioning can be trained and

enhanced. Specifically, having greater cognitive flexibility enables us to overcome deeply rooted and routine ideas and actions (Cohen & Hassin, 2018).

Increased cognitive flexibility could signify a variety of things. The ability to represent information from multiple perspectives and the appropriate application of that knowledge to activities or problem-solving is more specific examples. Cognitive flexibility, which is linked to the capacity to concentrate, block out unimportant information, and control our own ideas, helps us avoid becoming stuck in a cognitive rut by enabling us to connect or disconnect various parts of our brains and mental representations. The possibility for enhanced life skills, including higher adaptation, reason, risk assessment accuracy, impartiality, and tolerance, is one of the main advantages of cognitive flexibility (Cools & Esposito, 2010).

Divergent thinking is a key component of cognitive flexibility. Though it just means not getting caught up in one way of thinking, this is closely related to creative thinking. When you think divergently, your brain is in a state of defocused attention, meaning you are thinking widely and using different parts of your brain to make connections that might not be obvious at first. On the other hand, focused attention entails concentrating on a single thought and ignoring outside distractions. Because it enables you to break free from ingrained thought patterns and provide fresh insights, divergent thinking is a crucial component of cognitive flexibility (Zhou et al., 2017).

Neurotransmitters also affect cognitive flexibility. The body uses neurotransmitters as chemical messengers. They use the neurological systems in our bodies to send messages from one neuron to another. Even though dopamine is referred to as the neurotransmitter of pleasure and reward, it is particularly crucial for cognitive flexibility. It has an impact on the connection between brain regions that regulate executive functioning, which is in charge of

controlling cognition, including memory, attention, planning, multitasking, and so forth (Berry et al,.2018).

Cognitive flexibility forms the foundation of learning, enabling individuals to adapt effectively to changing environments. It allows learners to modify their habits, strategies, and knowledge in response to new or unfamiliar situations. In the book Cognitive Flexibility: Theory, Research, and Applications, Sternberg (2022) examines the core principles of cognitive flexibility, including its measurement, development, relationship with metacognition and critical thinking, and the influence of contextual factors on its expression. The book also highlights the role of cognitive flexibility in problem-solving, knowledge transfer, and analogy formation. By integrating convergent perspectives from cognitive and developmental psychology, Sternberg provides a comprehensive understanding of cognitive flexibility and outlines new instructional approaches informed by empirical research.

An information processing system that is easily able to adjust to new tasks and conditions is necessary for effective behavior in a changing environment. The system's level of flexibility determines this capability. While an inflexible or rigid system is restricted to a relatively small set of new conditions, a highly flexible system may adapt to a wide range of new ones. Generally speaking, being flexible means being able to swiftly pick up new abilities and pertinent knowledge in unfamiliar circumstances, as well as transferring and modifying existing knowledge to fit the needs of the new circumstance Strictly speaking, any problem-solving scenario may require a different set of tactics and processes. By definition, solving a problem involves more than just applying previously learned information, in contrast to merely completing a task. Finding a solution frequently entails altering one's perspective (as in the candle problem; Duncker, 1935), altering one's mental model (as in the

mutilated checkerboard problem), or altering one's approach (for instance, moving from a goal-driven to a more data-driven technique) (Anderson ,1990).

When a person lacks cognitive flexibility, they respond to situational demands in a nonfunctional manner, which frequently results in incorrect performance. This phenomenon has therefore been employed by various study fields to explain specific expert errors. According to certain authors, experts are more likely to be cognitively rigid (Anzai & Yokoyama 1984; Frensch & Sternberg 1989). In fact, empirical studies have demonstrated that expertise and rigidity are inherently linked (Frensch & Sternberg 1989). Additionally, specialists are believed to alter their mental models of jobs less frequently than beginners (Anzai & Yokoyama 1984). These authors generally make the assumption that when someone is aware of their skill, they are less likely to alter their approach after noticing notable changes and/or are less likely to notice them at all. Therefore, professionals are less competent to assess the possibility of a system failure when they rely on automated performance methods (Jose et al., 2006).

The intricacies of daily life emphasize the importance of cognitive flexibility. Cognitive flexibility encompasses an individual's self-efficacy in being adaptable, awareness of communication options, and readiness to adjust to the circumstances. To strengthen the validity of the Cognitive Flexibility Scale, multiple investigations have demonstrated its positive associations with key aspects of communication competence. Assertiveness and responsiveness were shown to correlate positively with cognitive flexibility, highlighting its role in effective interpersonal interactions. Additionally, individuals' self-assessments of cognitive flexibility were favorably aligned with evaluations provided by their peers, suggesting consistency across perspectives. Furthermore, a significant positive relationship was observed between cognitive flexibility and confidence in performing communication

tasks, underscoring its relevance to communicative self-efficacy (Martin & Rubin, 1995; Matthew & Anderson, 1998).

Cognitive flexibility, which enables individuals to shift perspectives, adapt to new solutions, and generate alternative situations, also plays a crucial role in regulating thought processes and imagination. However, when cognitive processes become excessively immersive or uncontrolled they may lead to maladaptive patterns such as excessive daydreaming. Maladaptive daydreaming represents a state where the mind's natural capacity for imagination and flexible thinking becomes overly absorbed, leading the distraction from reality and daily functioning. While cognitive flexibility supports creativity and problem-solving its imbalance combined with emotional or psychological factors can contribute to the development of vivid, compulsive and time-consuming fantasies.

Maladaptive Daydreaming

A hypothesized mental condition called maladaptive daydreaming (MD) is typified by excessive, compulsive immersion in intricate and vivid fanciful daydream narratives, leading to deep emotional involvement and frequently accompanied with stereotyped motions. Schupak (2017). This compulsive daydreaming becomes maladaptive when it takes up a lot of time each day, produces feelings of guilt or shame, makes it difficult to accomplish short- and long-term objectives, and generally results in clinically significant suffering and/or interferes with social or professional functioning. Maladaptive daydreamers, like those with other behavioral addictions, report a strong desire to daydream whenever possible and frustration when they are unable to do so. They also report several unsuccessful attempts to control, limit, or stop daydreaming (Pietkiewicz et al., 2018).

Excessive daydreaming, sometimes known as maladaptive daydreaming, is when someone's excessive daydreaming interferes with their everyday life. There are no important

psychological or physical factors that may be used to identify this disturbed form of dissociative absorption, which is associated with excessive fantasizing. Maladaptive daydreaming can interfere with everyday activities including work and social interactions, cause distress, and replace social interaction. In 2018, Pietkiewicz et al. Maladaptive daydreaming is not a commonly accepted diagnosis and is not listed in any major medical or psychiatric diagnostic manual. The University of Haifa's Somer (2005) is credited with coining the phrase. "Extensive fantasy activity that replaces human interaction and/or interferes with academic, interpersonal, or vocational functioning" is how some define the proposed condition.

Almost everyone engages in daydreaming, a common mental activity that is a type of normal dissociation linked to absorption (Singer, 1996). It has been stated that some people have the capacity to daydream so vividly that they feel as though they are physically there in the imagined setting (Somer, 2002). According to reports, this sensation is so fulfilling that some people become so driven to repeat it that it has been compared to an addiction (Somer et al, 2016). Some have suggested "stimuli" for maladaptive daydreams that might have to do with particular places. Extremely vivid imaginations with "story-like features"—such as the characters, plots, and settings of the daydream—are the primary symptom that has been suggested (Somer et al, 2016).

Maladaptive daydreaming is not a type of psychosis, according to Somer (2016), because persons who engage in it are able to recognize that their imaginations are not real, but those who suffer from psychotic disorders struggle to distinguish between reality and hallucinations or delusions.

Theoretical Framework

Attention Restoration Theory (Kaplan & Kaplan 1997) Self- Determination Theory (Deci & Ryan, 2000) Compensatory Model of Daydreaming (Sommer & Baumeister, 2002) and Ecopsychological Theory (Roszak, 1995) are the main sources of the theoretical framework used to understand the relationship between university students' maladaptive daydreaming, spirituality, cognitive flexibility, and connection to nature.

The interaction of the four theories provides a coherent explanation for the proposed conceptual model. Attention Restoration Theory (Kaplan & Kaplan, 1997) argues that exposure to natural environments restores depleted cognitive resources, which forms the foundation for improved executive functioning and flexible thinking.

However, the benefits of nature are not only cognitive; Ecopsychological Theory (Roszak, 1995) proposes that human–nature connection also evokes a sense of meaning, unity, and transcendence, thereby fostering spiritual awareness. This spiritual awakening becomes psychologically functional when viewed through Self-Determination Theory (Deci & Ryan, 2000), which explains that spirituality strengthens intrinsic motivation, emotional regulation, and openness core components of cognitive flexibility. Thus, spirituality acts as a psychological bridge that transforms the restorative effects of nature into adaptive cognitive outcomes. In contrast, the Compensatory Model of Daydreaming (Somer & Baumeister, 2002) explains how excessive, immersive fantasy disrupts attention, reduces environmental awareness, and interferes with executive control. Therefore, maladaptive daydreaming weakens the positive pathway from nature connectedness to cognitive flexibility by diverting cognitive resources inward and reducing the capacity to benefit from real-world restorative experiences. Together, these theories interact to justify the model in which spirituality

mediates, and maladaptive daydreaming moderates, the relationship between connectedness with nature and cognitive flexibility.

Attention Restoration Theory

The Attention Restoration Theory was developed in 1989 by Rachel and Stephen Kaplan. This idea holds that spending time in nature improves cognitive function and attention. People who are exposed to natural environments may be able to regain their ability to concentrate, according to Attention Restoration Theory (ART) In both practice and policy, the potential advantages of natural environments for human health and well-being are becoming more widely recognized. The strength of the scientific evidence supporting the proposed process is not totally clear, despite the fact that Attention Restoration Theory (ART) is commonly invoked to explain how this effect might occur. The capacity to concentrate on an effort-demanding task is referred to as directed or voluntary attention in cognitive psychology (Kaplan & Kaplan 1989).

Similarly, Kaplan (1995) found that among 188 residents in six low-rise apartment complexes, window views of a natural environment (e.g., trees, landscaped gardens, or groomed lawns) strongly predicted psychological health, attentional functioning, and residential satisfaction. The results further supported Kaplan's (1993) Attention Restoration Theory, which postulates that people may be able to maintain greater levels of cognitive focus and attention in natural environments.

Eco psychological Theory

Exposure to nature has been found to positively correlate with psychological aspects of wellness, including positive affect (Mayer et al., 2009), cognitive functioning (Kaplan, 2001; Taylor et al., 2001; Wells, 2002; Wells & Evans, 2003), and higher self-esteem (Pretty et al., 2007). Additionally, a sense of connectedness to nature is positively correlated with

psychological health outcomes (Hennigan, 2010; Mayer et al., 2009). Although some research has looked at how and why spending time in nature has a good effect on psychological functions like attentional stability (Berman et al., 2008; Kuo, 2001), more research could improve our comprehension of this connection.

Since ecopsychologists typically believe that spirituality is experienced in and through a sense of oneness with nature, spirituality may be relevant to further explaining the positive effects of nature on psychological wellness (Fox, 1995; Roszak, 1995; Winter, 1996). According to eco psychology theory, a person's "ecological self" emerges in response to feeling a wide sense of biophysical and spiritual connectedness to the natural world (Bragg, 1996; Wilson, 1996). An "expansive or field like sense of self, which ultimately includes all life forms, ecosystems, and the earth itself" (Bragg, 1996, p. 95) is the result of this development, which represents a shift in self-perception and a departure from individualistic conceptions of self, the "I" that dominate Western psychology (Gergen, 1985; Markus & Kitayama, 1991). This study is to investigate how this type of spirituality contributes to the documented impacts of being in and linked to nature on psychological wellness in light of eco psychology theory.

Self-Determination Theory

Self-Determination Theory (SDT), which posits that human beings have three basic psychological needs that underpin growth, motivation, and psychological well-being, provides support for the current study (Deci & Ryan, 2000). These needs are autonomy, competence, and relatedness. When individuals experience a sense of connectedness and fulfillment of these needs, they develop intrinsic motivation and personal harmony. Regarding the current study's context, students who experience a stronger connectedness to nature fulfill their need for relatedness by feeling part of a larger, meaningful environment.

This connectedness strengthens their spirituality, promotes a sense of purpose, and enhances overall emotional regulation.

Furthermore, Self-Determination Theory clarifies that when these psychological needs are satisfied, individuals rely less on avoidance-based or compensatory behaviors such as maladaptive daydreaming. Students who are more intrinsically motivated and spiritually centered are less likely to engage in excessive fantasy because they already derive satisfaction from real-life experiences. Cognitive flexibility also plays an important role in this process, as flexible thinkers can adapt to situational changes and control attention more effectively. Thus, Self-Determination Theory helps explain how fulfilling intrinsic psychological needs through nature connection and spirituality can protect against maladaptive imagination and promote mental balance.

Compensatory Model of Daydreaming

The Compensatory Model of Daydreaming proposes that individuals use daydreaming as a mechanism to compensate for unmet emotional or psychological needs (Sommer & Baumeister, 2002). When real-world experiences fail to provide satisfaction or meaning, individuals may turn inward, constructing fantasy scenarios that temporarily fulfill those missing needs. Within the context of the current study, university students who experience low spirituality or limited connectedness to nature may be more vulnerable to maladaptive daydreaming, using their imagination as an escape from stress, boredom, or emotional discomfort.

However, students who demonstrate higher cognitive flexibility can shift attention and reinterpret experiences more effectively, reducing the need to rely on excessive daydreaming. Flexible cognition allows them to regulate emotional responses and cope

constructively with challenges, preventing fantasy from becoming maladaptive. Therefore, the Compensatory Model of Daydreaming provides a psychological explanation for how deficits in emotional fulfillment and adaptability can lead to persistent daydreaming, while higher levels of spirituality, cognitive flexibility, and nature connectedness may serve as protective factors against it.

Literature Review

Psychological research has increasingly highlighted the role of environmental, cognitive, and internal psychological factors in shaping the mental health and adaptive functioning of university students. Among these, connectedness with nature, spirituality, cognitive flexibility, and maladaptive daydreaming have emerged as influential constructs that contribute to students' emotional regulation, problem-solving abilities, and overall psychological resilience. These variables not only represent individual differences in perception and behavior but also interact in meaningful ways that influence academic performance and personal development.

Connectedness with nature refers to the extent to which individuals perceive themselves as part of the natural world. Mayer and Frantz (2004) conceptualized it as a stable cognitive-emotional orientation that reflects one's sense of belonging to nature. Schultz (2002) further argued that individuals who incorporate nature into their self-concept tend to demonstrate greater ecological concern and enhanced psychological well-being. Empirical studies consistently show that exposure to natural environments improves mood, reduces stress, and enhances mental clarity (Richardson et al., 2016; Cervinka et al., 2012). These findings align with Wilson's (1984) biophilia hypothesis, which proposes that humans possess an innate tendency to seek connection with nature, contributing to emotional balance and adaptive functioning. Collectively, this body of research suggests that nature

connectedness serves as a psychological resource that supports both emotional and cognitive health.

Spirituality, broadly defined as the pursuit of meaning, transcendence, and connection with a higher or deeper reality, also plays a significant role in psychological development. (Kamitsis & Francis, 2013) noted that spiritual experiences often emerge through interactions with natural environments, highlighting a meaningful link between ecological awareness and spiritual growth. Spirituality encompasses both religious and non-religious dimensions, including mindfulness, introspection, and ethical living. Delaney (2005) emphasized that spirituality fosters a sense of purpose and interconnectedness, which strengthens emotional resilience and cognitive adaptability. Within educational contexts, spirituality has been associated with enhanced self-awareness, ethical decision-making and academic motivation (Flower, 2004; Fowler & Peterson, 1997). Taken together, these findings indicate that spirituality contributes to psychological well-being by promoting reflective thinking, emotional regulation, and openness to new perspectives.

Cognitive flexibility, a central component of executive functioning, refers to the ability to shift perspectives, adapt to changing circumstances, and generate alternative solutions. Dennis and Vander Wal (2010) described it as the capacity to view challenging situations as manageable and to consider multiple approaches to problem-solving. Research demonstrates that cognitive flexibility is positively associated with creativity, emotional intelligence, and academic achievement (Cools & Esposito, 2010; Abdullah et al., 2016). It enables students to navigate complex academic tasks and interpersonal challenges with greater adaptability. Neurobiological evidence further suggests that cognitive flexibility is influenced by dopamine-related executive control processes, which support mental

adaptability and decision-making (Berry et al., 2018). Overall, cognitive flexibility is a crucial skill that underpins effective learning and psychological resilience.

In contrast, maladaptive daydreaming represents a disruptive psychological pattern characterized by excessive, immersive fantasy activity that interferes with daily functioning. Somer et al. (2017) conceptualized it as a form of dissociative absorption associated with emotional distress, social withdrawal, and impaired goal pursuit. Unlike typical daydreaming, which may enhance creativity or provide emotional relief, maladaptive daydreaming is compulsive and often accompanied by guilt, shame, and loss of control (Pietkiewicz et al., 2018). It has been linked to reduce academic performance, impaired attentional control, and heightened psychological distress. (Bigelsen & Schupak, 2011) found that individuals with maladaptive daydreaming frequently struggle to regulate attention and maintain focus on academic tasks, suggesting a detrimental impact on cognitive functioning.

Synthesizing these perspectives reveals a complex psychological framework in which environmental connectedness, spiritual engagement, and cognitive adaptability interact to shape student well-being. Connectedness with nature and spirituality appear to function as protective factors that enhance cognitive flexibility and emotional resilience. In contrast, maladaptive daydreaming may undermine these adaptive processes by disrupting attentional control and reducing engagement with real-world tasks. Understanding how these variables interact is essential for developing holistic interventions that support university students' mental health, integrating ecological, spiritual, and cognitive dimensions of psychological functioning.

Spirituality and Connectedness to Nature

A growing body of research demonstrates that exposure to natural environments contributes significantly to psychological well-being. Time spent in nature has been linked with enhanced positive affect (Mayer et al., 2009), improved cognitive functioning (Kaplan, 2001; Taylor & Sullivan, 2001; Wells, 2002; Wells & Evans, 2003), and increased self-esteem (Pretty et al., 2007). Similarly, individuals who report a strong sense of connectedness to nature tend to experience better psychological health outcomes (Hennigan, 2010; Mayer et al., 2009). Although previous studies have explored mechanisms such as attentional restoration to explain these benefits (Berman et al., 2008; Kuo, 2001), further research is needed to clarify the deeper psychological processes underlying this relationship.

Ecopsychological perspectives suggest that spirituality may be one such mechanism. Ecopsychologists argue that spiritual experiences often arise through a felt sense of unity with the natural world (Fox, 1995; Roszak, 1995; Winter, 1996). According to ecopsychology theory, individuals develop an "ecological self" when they experience both biophysical and spiritual connectedness to nature (Bragg, 1996; Wilson, 1996). This expanded sense of self represents a shift away from individualistic Western conceptions of identity (Gergen, 1985; Markus & Kitayama, 1991) toward a more relational, field-like understanding of the self that includes all living beings and ecosystems (Bragg, 1996). From this perspective, spirituality may help explain why nature connectedness contributes to psychological wellness.

Empirical evidence further supports the idea that emotional connection to nature is strongly associated with psychological well-being (Cervinka et al., 2012; Howell et al., 2011). However, the specific pathways linking nature connectedness to eudaimonic well-being remain unclear. The ecological-self hypothesis proposes that human flourishing is intertwined with natural environments and is experienced through engaged spirituality (Bragg, 1996). This is consistent with findings that spirituality predicts eudaimonic

well-being (Greenfield et al., 2009) and is associated with both the frequency and quality of nature experiences (Saroglou et al., 2008; Williams & Harvey, 2001). Although this relationship has not yet been empirically tested, it is plausible that spirituality mediates the link between nature connectedness and eudemonic well-being.

Beyond psychological well-being, interactions with nature have been shown to improve affective states (Alcock et al., 2014; McMahan & Estes, 2015), reduce stress (Jiang et al., 2016), and enhance physiological health indicators such as cardiovascular and metabolic functioning (Kardan et al., 2015; Shanahan et al., 2016; Crouse et al., 2017). Nature exposure has also been associated with improvements in executive cognitive abilities, particularly focused attention (Berman et al., 2008, 2012; Bratman et al., 2012). These findings suggest that nature influences both emotional and cognitive domains, providing a foundation for understanding how spirituality may interact with nature connectedness to support psychological health.

Understanding the relationship between spirituality and psychological well-being requires both theoretical clarity and empirical investigation. A central question concerns whether spirituality should be conceptualized as a component of well-being or as a distinct construct that influences well-being outcomes such as purpose in life and personal growth. Scholars have increasingly recognized spirituality as a contributor to positive psychological outcomes (Ager et al., 2015; Bryant-Davis et al., 2013). Although spirituality, faith, and religiosity are conceptually distinct, they are often treated as overlapping or interchangeable in academic research (Lunn, 2009; Marler & Hadaway, 2002; Scott et al., 2018). Consistent with prior studies examining well-being (Makanui et al., 2019; Scott et al., 2018), the present

study adopts a broad definition of spirituality that includes belief systems, connection with a higher power, sense of purpose, and spiritually oriented behaviors.

The human–nature relationship has been widely explored across the social and behavioral sciences over the past three decades (Degenhardt, 2002; Schultz, 2001a, 2001b, 2002; Mayer & Frantz, 2004; Orr, 2004; Nisbet et al., 2009). Research on connectedness to nature (CNT) seeks to understand how individuals relate to and identify with the natural world. However, the diversity of terminology such as nature relatedness (Nisbet et al., 2009), nature connectedness (Schultz, 2002), love and care for nature (Perkins, 2010), nature connectivity (Dutcher et al., 2007), emotional affinity for nature (Kals et al., 1999), dispositional empathy with nature (Tam, 2013a, 2013b, 2013c), and inclusion of nature in the self (Schultz, 2001a, 2001b) reflects the complexity of this construct and highlights the need for synthesized reviews to identify common themes.

Several scholars argue that modern industrialized societies have become increasingly disconnected from nature (Melson, 2001; Shepard, 1993, 1996). Urbanization and technological advancement reduce daily contact with natural environments (Axelrod & Suedfeld, 1995; Beck & Katcher, 1996; Katcher & Beck, 1987), potentially weakening empathy for other species and diminishing support for conservation (Louv, 2008; Kellert, 1997; Conn, 1998). Reduced nature experiences may also disrupt intergenerational transmission of environmental values (Kahn et al., 2009) and contribute to a broader societal undervaluing of ecological systems (Monbiot, 2013). Understanding how connectedness to nature influences pro-environmental intentions is therefore essential for promoting biodiversity and sustaining ecological identity (Howard, 1997; Schultz, 2000).

The concept of biophilia, introduced by Wilson (1984), describes humans' innate attraction to nature. Attachment to natural places shapes identity and self-definition (Clayton

& Opotow, 2003; Mayer & Frantz, 2004; Schultz et al., 2004), contributing to what Naess (1973) termed "ecological identity." Perkins (2010) similarly described love and care for nature as a deep emotional bond that includes recognizing nature's intrinsic value and feeling responsible for its protection. Nisbet et al. (2009) expanded this idea through the construct of nature relatedness, emphasizing individuals' connection to all living organisms, including those perceived as unattractive or threatening. Together, these perspectives highlight the multidimensional nature of human–nature relationships and underscore the psychological significance of feeling connected to the natural world.

Although most studies agree that nature exposure enhances psychological well-being (Mayer et al., 2009; Cervinka et al., 2012), the mechanisms underlying this relationship remain inconsistent. Some researchers emphasize attentional restoration as the primary pathway (Berman et al., 2008; Kuo, 2001), whereas ecopsychology perspectives highlight spirituality and the development of an "ecological self" (Bragg, 1996; Roszak, 1995). These differing explanations suggest that the effects of nature may not be uniform across individuals or contexts. Additionally, much of the existing research is based on Western samples, limiting generalizability to collectivistic cultures such as Pakistan, where spirituality may play a more central role in shaping nature connectedness. The lack of studies examining spirituality as a mediator further indicates a theoretical gap that the present study addresses.

Connectedness to Nature and Cognitive Flexibility

A substantial body of research demonstrates that exposure to natural environments enhances cognitive, emotional, and psychological well-being. Intervention studies combining real-world nature contact (Coventry et al., 2021; Keenan et al., 2021) with nature-stimulated environments such as guided imagery (Bielinis, Simkin, Puttonen, & Tyrväinen, 2020; Gamble, Howard, & Howard, 2014; Koivisto & Grassini, 2022; Nguyen & Brymer, 2018;

Wolf et al., 2017) consistently show improvements in mood, attention, and cognitive functioning. Guided imagery techniques simulate natural experiences through verbal cues that evoke tactile, olfactory, visual, and auditory sensations, closely mirroring the perceptual qualities of direct nature exposure. The primary difference between real and simulated nature lies in the absence of external sensory cues (Koivisto & Grassini, 2022; Yijing, Xiaoping, Fang, Xiaolu, & Bin, 2015). These findings suggest that both direct and imagined nature experiences may elicit emotional and cognitive responses associated with cognitive flexibility, particularly openness to new perspectives and shifts in mental framing (Grattan & Eslinger, 1989).

Nature exposure has also been shown to enhance a range of cognitive processes, including working memory, attentional control, and cognitive flexibility (Schertz & Berman, 2019; Sharam, Mayer, & Baumann, 2023; Stevenson, Schilhab, & Bentsen, 2018). Cognitive flexibility is closely linked with emotional development, as evidenced by its associations with early emotion understanding (Wang, Liu, & Feng, 2021), facial emotion recognition (Fabio, Esposito, Carrozza, Pino, & Caprì, 2020), and emotion regulation (Arici‐Ozcan, Cekici, & Arslan, 2019; Kim & Hyun, 2018). These relationships highlight the interconnectedness of emotional processing and flexible thinking, suggesting that natural environments may support cognitive flexibility by fostering emotional openness and the ability to integrate multiple ideas simultaneously (Grattan & Eslinger, 1989; Magnusson & Brim, 2014).

Cognitive flexibility has been defined by Baddeley (2012) as the capacity to dynamically adjust one's responses to changing environmental demands. Neurobiological research links this ability to hippocampal structure and function (Anacker & Hen, 2017; Burghardt, Park, Hen, & Fenton, 2012; Levy‐Gigi, Szabo, Richter‐Levin, & Kéri, 2015), suggesting that flexible thinking plays a crucial role in stress regulation (Fu & Chow, 2017;

Nachum & Levi, 2019; Ionescu, 2012). Trauma research further demonstrates that individuals with higher cognitive flexibility exhibit fewer Post-Traumatic Stress Disorder (PTSD) symptoms, greater post-traumatic growth, and enhanced life satisfaction (Hijazi, Keith, & O'Brien, 2015; Joseph & Gray, 2011; Keith, Velezmoro, & O'Brien, 2015; Levy-Gigi et al., 2012; Metzl, 2009; Palm & Follette, 2011; Radell, Beck, Gilbertson, & Myers, 2017).

Studies comparing individuals with and without PTSD reveal that both groups can form and maintain positive and negative stimulus–outcome associations (Haim-Nachum & Levy-Gigi, 2019; Levy-Gigi, Richter-Levin, Okon-Singer, Kéri, & Bonanno, 2016; Levy-Gigi et al., 2012, 2015). However, individuals with PTSD show significant difficulty reversing learned associations when environmental contingencies change. This selective impairment is negatively correlated with hippocampal volume (Levy-Gigi et al., 2015), underscoring the neurocognitive basis of reduced flexibility in trauma-affected populations.

Nature-based therapeutic interventions, such as "nature adventure rehabilitation," incorporate physical activity in outdoor settings to support psychological recovery (Russell, 2001; Dietrich, Joye, & Garcia, 2015). Sailing-based programs, for example, expose PTSD patients to challenging but non-trauma-related situations, helping them develop adaptive coping strategies (Caddick & Smith, 2014; Dietrich et al., 2015; Gelkopf, Hasson-Ohayon, Bikman, & Kravetz, 2013; Rosenbaum et al., 2015). These interventions have been shown to reduce PTSD and depression symptoms while improving daily functioning, emotional well-being, and hope (Dietrich et al., 2015; Gelkopf et al., 2013). Such findings suggest that nature-based activities may enhance cognitive flexibility by promoting adaptive responses to stress and encouraging engagement with novel experiences.

While numerous studies demonstrate that nature exposure improves cognitive flexibility and attentional control (Schertz & Berman, 2019; Stevenson et al., 2018), findings are not entirely consistent. Some research shows that simulated nature environments, such as guided imagery, produce similar cognitive benefits (Koivisto & Grassini, 2022), whereas other studies argue that real sensory engagement is necessary for optimal cognitive restoration (Berman et al., 2008). This inconsistency raises questions about whether cognitive gains stem from environmental stimuli or from internal emotional and imaginative processes. Moreover, much of the literature focuses on clinical populations such as PTSD patients, making it unclear whether the same mechanisms apply to non-clinical university students. These gaps highlight the need for studies examining cognitive flexibility in everyday academic contexts.

Maladaptive Daydreaming

Begum and Jabeen (2024) demonstrated that childhood emotional maltreatment is a significant predictor of maladaptive daydreaming among adolescents, with emotional processing partially mediating this relationship. Their findings highlight that adolescents who experience emotional maltreatment are more likely to engage in excessive fantasy activity, and this tendency is strengthened when emotional processing difficulties are present. This suggests that maladaptive daydreaming may function as a coping mechanism for unresolved emotional distress.

Although imagination, fantasy, and mind wandering are common cognitive processes that can enhance creativity and psychological well-being (Soffer et al., 2020; van der Linden & D'Argembeau, 2012), they also involve a temporary disengagement from ongoing tasks. Such mental shifts may promote novel ideas or simply provide a brief escape from immediate demands (Linden & D'Argembeau, 2012). Daydreaming can also support empathy and

emotional self-regulation (Smallwood & Schooler, 2015). However, these adaptive forms of daydreaming differ substantially from maladaptive daydreaming, which involves intense, immersive fantasies that interfere with daily functioning.

Maladaptive daydreaming is characterized by psychological distress and significant impairment in social, academic, and occupational domains (Bigelsen & Somer, 2016; Somer, 2002). Individuals often experience a compulsive urge to engage in prolonged fantasy, which reduces the translation of creative ideas into real-world action (Greene et al., 2020; Somer et al., 2017). Some scholars describe maladaptive daydreaming as a behavioral addiction due to its compulsive nature and the difficulty individual's face in controlling it (Pietkiewicz et al., 2018). Stereotypical movements such as rocking, pacing, or hand motions, along with the use of music to maintain trance-like states, are commonly reported (Bigelsen & Schupak, 2011; Somer et al., 2016). Importantly, maladaptive daydreaming appears across cultures and genders, even though the content of fantasies may vary culturally (Soffer-Dudek et al., 2020). Regardless of demographic background, individuals with clinical levels of maladaptive daydreaming experience disruptions in daily functioning and long-term goal pursuit (Soffer-Dudek & Schimmenti, 2020).

Maladaptive daydreaming frequently co-occurs with other psychological difficulties, including social anxiety, obsessive-compulsive symptoms, depression, dissociation, and ADHD-related traits (Soffer-Dudek, 2019; Somer & Herscu, 2017; Somer et al., 2017). This comorbidity reflects a cyclical pattern in which emotional distress triggers immersive daydreaming, which then limits opportunities to develop healthy emotion regulation skills. Individuals who experience a strong compulsion to daydream often report greater difficulty managing their emotions (Soffer-Dudek & Somer, 2018; West & Somer, 2019), suggesting

that maladaptive daydreaming may both result from and contribute to emotional dysregulation.

Although daydreaming is often associated with creativity and emotional regulation (Soffer et al., 2020; Smallwood & Schooler, 2015), research on maladaptive daydreaming presents a contrasting picture, emphasizing impairment and psychological distress (Bigelsen & Somer, 2016). This contradiction suggests that the impact of daydreaming depends on its intensity, controllability, and emotional function. However, most studies rely on clinical or self-selected samples, which may overrepresent severe cases and limit understanding of maladaptive daydreaming in general student populations. Additionally, the direction of causality remains unclear: emotional distress may trigger maladaptive daydreaming, but excessive daydreaming may also worsen emotional dysregulation (Soffer-Dudek & Somer, 2018). These limitations underscore the need for research exploring how maladaptive daydreaming interacts with cognitive flexibility in non-clinical educational settings.

Demographic factors also play an important role in shaping psychological and behavioral outcomes. Gender differences are frequently observed, with female students often reporting higher levels of spirituality and emotional sensitivity, whereas male students tend to demonstrate stronger cognitive flexibility and problem-solving skills (Haim et al., 2018). Age and educational level further influence these patterns: younger and undergraduate students typically show stronger connectedness to nature due to greater emotional openness, while older and postgraduate students exhibit more advanced cognitive flexibility as a result of increased academic and life experience (Sternberg, 2022). Family structure also contributes to these differences. Individuals from joint families often report higher spirituality and nature connectedness, likely due to collective values and emotional support, whereas those from

nuclear families may develop greater cognitive flexibility through independent decision-making (Cohen & Hassin, 2018).

Although demographic patterns such as gender differences in spirituality and cognitive flexibility (Haim et al., 2018) are frequently reported, these findings are not universal. Cultural norms, educational environments, and family structures vary widely across societies, making it difficult to generalize results. For example, joint family systems may enhance spirituality in South Asian contexts, but this pattern may not hold in more individualistic cultures. Similarly, the assumption that nuclear families promote cognitive flexibility may overlook socioeconomic and educational differences. These inconsistencies highlight the importance of examining demographic influences within specific cultural contexts, such as Pakistani university students.

Together, these findings illustrate that maladaptive daydreaming is shaped by emotional vulnerabilities, developmental experiences, and broader social contexts. Its strong associations with emotional dysregulation and attentional difficulties help explain why maladaptive daydreaming may interfere with adaptive cognitive processes such as cognitive flexibility an important consideration for understanding its role in university students' psychological functioning.

Rationale

In the evolving landscape of psychological research in Pakistan, there is increasing recognition of the need to examine holistic factors that shape student well-being and cognitive adaptability. Although constructs such as spirituality and cognitive flexibility have received some scholarly attention, the integration of environmental and behavioral dimensions particularly connectedness with nature and maladaptive daydreaming remains largely unexplored. For example, (Anwar & Rana, 2023) highlighted the role of spiritual

intelligence in predicting psychological well-being among Pakistani university students, emphasizing its contribution to emotional regulation and academic motivation. However, their work did not address how spirituality interacts with environmental or cognitive variables. Similarly, (Abdullah et al., 2016) investigated cognitive flexibility in relation to stress and academic performance but did not consider the influence of nature connectedness or the mediating role of spirituality.

Research on maladaptive daydreaming in Pakistan is still emerging. Existing evidence indicates that maladaptive daydreaming negatively affects students' functioning and is associated with social anxiety and emotional distress (Somer, 2018). Yet, no local studies have explored its moderating role in cognitive adaptability or its interaction with nature-related experiences. At the same time, connectedness with nature widely studied internationally for its restorative and cognitive benefits has received limited empirical attention in Pakistan, where environmental research has primarily focused on sustainability and awareness rather than psychological outcomes (Richardson et al., 2016; Cervinka et al., 2012).

Recent Pakistani research has begun to shed light on the psychological mechanisms underlying maladaptive daydreaming. Findings from (Begum & Jabeen, 2024) indicate that childhood emotional maltreatment predicts maladaptive daydreaming, with emotional processing partially mediating this relationship. These results suggest that maladaptive daydreaming may function as an avoidant coping strategy rooted in unresolved emotional trauma and impaired emotional regulation.

By examining the interplay between spirituality, cognitive flexibility, connectedness with nature, and maladaptive daydreaming among Pakistani university students, the present

study addresses these gaps. It introduces an analytical framework not previously applied in local research, incorporating spirituality as a mediator and maladaptive daydreaming as a moderator. Through the use of standardized measures and advanced statistical analyses, the study provides a comprehensive understanding of how environmental and spiritual engagement may enhance cognitive adaptability, while identifying behavioral tendencies that may hinder this process. The findings offer meaningful implications for mental health practitioners, educators, and policymakers seeking to promote holistic development and psychological resilience within academic settings.

Objective of the Study

1. To examine the relationship between connectedness with nature, cognitive flexibility, spirituality and maladaptive daydreaming among university students.
2. To investigate the impact of connectedness with nature on cognitive flexibility among university students.
3. To study the mediating effect of spirituality in the relationship between connectedness with nature and cognitive flexibility among university students.
4. To determine the maladaptive daydreaming as moderator in the relationship between connectedness with nature and cognitive flexibility among university students.
5. To study the effect of demographic variable like age, gender education and family system on connectedness with nature, cognitive flexibility, spirituality and maladaptive daydreaming among university students.

Hypotheses

1. There is a positive relationship between connectedness with nature and psychological strengths such as cognitive flexibility and spirituality among university students.

2. Maladaptive Daydreaming is negatively correlated with Connectedness with nature, Cognitive Flexibility and Spirituality among university students.
3. Spirituality work as mediator between Connectedness with Nature and Cognitive Flexibility among university students
4. Maladaptive Daydreaming moderates the relationship between Connectedness with Nature and Cognitive Flexibility among university students.
5. Female university students will be higher than male students on spirituality and maladaptive daydreaming.
6. Male university students will be higher on cognitive flexibility than female students.
7. Students from joint families will score significantly higher on spirituality and connectedness with nature than students from nuclear families.
8. Students from nuclear families will be higher on maladaptive daydreaming than those from joint families.

Conceptual Frameworks

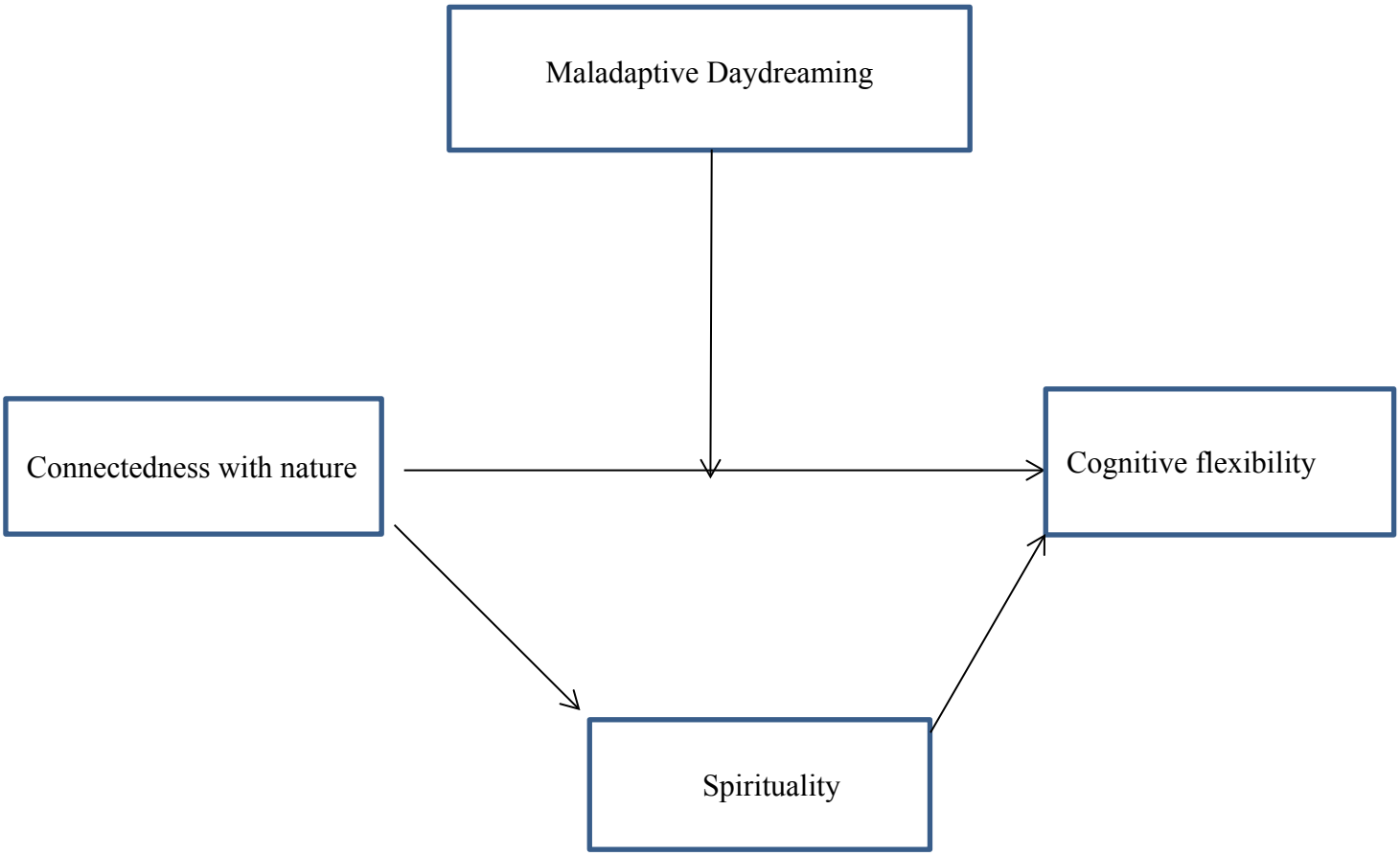

Figure 1 Conceptual framework

Chapter 2

Method

Research Design

The study will employ a quantitative cross-sectional research approach. This kind of study examines data from a sample population at a specific point in time. The prevalence of risk variables is estimated by cross-sectional research.

Sample

There were 200 university students in the sample (114 males and 86 females). They ranged in age from 18 to 26. University students were studying at undergraduate BS and postgraduate MS/MPhil degree programs. The study's sample was drawn from several Pakistani universities National University of Science and Technology (NUST), Iqra University Islamabad, Fast University Islamabad and National University of Modern Languages Islamabad (NUML). Of these, 127 participants were enrolled in undergraduate BS programs and 73 were enrolled in MS/MPhil programs. In terms of age distribution, 71 students fell within the 18–21 years category, while 129 students were between 22–26 years. Regarding family system, 123 students belonged to joint families, whereas 76 students came from nuclear families. Data collection would be conducted by the survey method and questionnaires would be distributed among university students.

Inclusion Criteria

Student having range between 18 to 26 years has been included they would be student of bachelor and master level.

Exclusion Criteria

Student suffering from mental health problems are excluded because research measure the cognitive flexibility.

Operational Definitions

Nature connectedness

A self-perceived bond between oneself and the natural environment is known as connectedness to nature (Schultz et al., 2004). The connectivity to Nature Scale (CNS) has been used to measure nature connectivity (Mayer & Frantz, 2004). Interpretations of high and low scores show varying degrees of an individual's natural connection.

Cognitive Flexibility

Scott (1962) and Rende (2000) define One facet of executive functioning is cognitive flexibility, which is a general cognitive talent or trait characteristic that enables a person to think through several concepts, transition between cognitive sets with ease, and stop habitual responses when circumstances in the environment change. The Cognitive Flexibility Inventory Scale (CFL), developed by Dennis and Vander Wal (2010), has been used to measure cognitive flexibility. According to Dennis and Vander Wal (2010), higher scores on the scale indicate greater cognitive adaptability, which is linked to greater CF when faced with stressful situations, while lower scores indicate greater cognitive rigidity, which is linked to less cognitive adaptability.

Spirituality

"A transcendental relationship with the higher being, leading us to the path of self-awareness and self-engagement, which enables us to serve others for the benefit of society at large" is how (Makkah & Singh 2018) define spirituality. Spirituality has been measured through Spirituality Measurement Scale (SMS) (Makkah & Singh) (2018). In the present study, the individual high score on Spirituality Measurement Scale (SMS) will show the spirituality in individuals.

Maladaptive Daydreaming

Maladaptive daydreaming, according to Somer (2002), could be described as avoidant behavior of real-life threats that is reinforced by negative reinforcement. Maladaptive daydreaming has been assessed through Maladaptive Daydreaming Scale (MDS) Somer (2016). High and low score interpretation indicate high and low level of Maladaptive Daydreaming of individuals.

Instruments

Demographic Sheet

A demographic sheet will be presented first in order to get information needed for the study including age, gender, educational level etc.

All scales used in the study were administered in their original English versions. These instruments have been previously utilized in Pakistani research with university student samples, demonstrating acceptable reliability and conceptual relevance within the local context. No cultural adaptation or translation procedures were required, as participants were proficient in English and able to comprehend the items without difficulty. However, the psychometric properties were re-examined in the present study to ensure reliability for the current sample.

Connectedness to Nature Scale

The 14 items on the Connectedness to Nature Scale (CNS), created by Mayer and Frantz (2004), are intended to gauge people's emotional attachment to the natural world. On a scale of 1 (strongly disagree) to 7 (strongly agree), respondents indicate how much they agree with each statement. Strong reliability and good internal consistency have been established by the scale (Cronbach's alpha is normally at least 0.87). The scale has demonstrated construct validity, correlating positively with pro-environmental behaviors and attitudes. It also correlates with personality traits like openness to experience and environmental attitudes, which suggests it accurately measures what it intends to. Scores on

the CNS range from 14 to 70, with higher scores indicating a stronger connection to nature. Scores between 56-70 are generally considered to indicate a high connection to nature. Scores between 14-35 indicate a low connection to nature.

Cognitive Flexibility Inventory

Dennis and Vander Wal (2010) created the Cognitive Flexibility Inventory (CFI), a measure consisting of 20 self-report items. It was created to assess the propensity to view challenging circumstances as manageable, the capacity to see several options or answers to challenging circumstances, and the capacity to come up with several different solutions for challenging circumstances. The participant rates each statement on a scale of 1 (strongly disagree) to 7 (strongly agree). When assessed in two stages (test-retest), Dennis and Vander Wal (2010) discovered a two-factor structure (Control and Alternatives) and sufficient internal consistency. Cronbach's alpha is.90 (time 1) and.91 (time 2) for the scale,.91 (time 1 and 2) for the alternative subscale, and.86 (time 1) and.84 (time 2) for the control subscale. Higher scores (over 4.0, for example) indicate a high degree of cognitive flexibility, which indicates that the person can more easily modify their thinking to fit novel, challenging, or evolving circumstances. Low cognitive flexibility is indicated by scores in the lower range, such as less than 2.5.

Spirituality Measurement Scale

Makkah and Singh (2018) created the Spirituality Measurement Scale (SMS). There are 38 items on the Spirituality Measurement Scale. The Liker's scale has five points, ranging from strongly disagree to strongly agree. The Spirituality Measurement Scale's Cronbach's alpha score of 0.94 indicated its reliability. The Spirituality Measurement Scale by (Makkah & Singh) has shown construct validity, correlating with measures of emotional well-being, mental health, and positive personal traits like compassion and purpose in life. High scores on the SMS (typically above 3.5) indicate a strong spiritual orientation or a high level of spiritual

well-being. Individuals scoring in this range often report a deep sense of meaning, purpose, and connection with the transcendent or divine. Low scores (typically below 2.5) suggest a low level of spirituality or a weaker sense of spiritual engagement. These individuals may experience less connection with spiritual or transcendent practices and values.

Maladaptive Daydreaming Scale

The Maladaptive Daydreaming Scale (MDS-16; 2016) was created by Somer et al. (2017). A 16-item self-report survey called the Maladaptive Daydreaming Scale-16 was created to gauge maladaptive daydreaming. The previous 14-item maladaptive daydreaming scale is replaced with a 16-item maladaptive daydreaming assessment. With 10% intervals, the scale ranged from 0% to 100% (0 % = never to 100% = always). In addition to successfully differentiating self-identified maladaptive daydreamers from non-maladaptive daydreamers, a score of 40 or higher suggests clinical-level suspicion of maladaptive daydreaming. It also showed good internal consistency and temporal stability (test-retest reliability, r =.92). Global psychopathology, traumatic experiences, maladaptive personality traits, dissociation, feelings of shame, and anxious attachment styles were all associated with scores on the Maladaptive Daydreaming Scale-16. An accurate distinction between excessive and normal daydreamers may be made with a cut-off score of 60%. In the current investigation, an alpha coefficient of.79 was obtained for this scale.

Ethical Considerations

Ethical clearance from the head of the institutions and the Ethical Review Board of the Department of Psychology at IIUI. Additionally, the participants' informed consent was obtained, and their answers were kept private and confidential.

Procedure

The researcher reached a university sector student with the consent of the relevant authorities. Following a brief explanation of the study, the respondents' or authorities'

informed consent was acquired. The information was then gathered using questionnaires, and the information provided by the respondents was kept private. After that, the data was gathered, and all of the misunderstandings were resolved. Additionally, when a person answers the question, they are asked to be truthful. The researcher provided brief instructions on how to fill out the questionnaires and ensured that participants understood each section before beginning. The researcher remained available throughout the process to answer any queries and clarify items, without influencing their responses. Once the questionnaires were completed, participants returned them directly to the researcher some questionnaire filled online on Goggle form. All completed forms are checked immediately for missing entries and participants were requested politely to complete any unintentionally skipped items. After data collection, the responses were coded and entered into SPSS. Data cleaning was performed by checking for errors, missing values, and outliers. Descriptive statistics, correlation, linear regression, and t-test were then applied to analyze the results.

Chapter 3

Results

Table 1

Frequencies and percentages of demographic variables' (N=200)

Variables	Category	*f*	*%*
Education	BS	127	63.5
	MS	73	36.5
Age	18-21	71	34.5
	22-26	129	64.5
Gender	Male	114	57.0
	Female	86	43.0
Family Type	Joint	123	61.5
	Nuclear	76	38.0

Table one shows frequency and percentage of demographic variables of the study which are education, age, family type and gender. There are 34.5% participants lie in 18 to 21 age range and 64.5% participants lie in range of 22 to 26 in the sample of different age range. Participants have different level of education 63.5% from BS level and 36.% participants are from MS in the sample. 61.5% participants are belong to joint family system and 38.0% are belong to nuclear family.

Table 2

Descriptive Statistics and psychometric properties of the scales used in the study (N= 200)

Scales	K	α	M (SD)	Range		Skewness	Kurtosis
				Potential	Actual		
CN	14	.75	47.55(6.26)	14-70	30-61	-0.66	0.49
CFI	20	.59	89.43(9.24)	20-140	66-126	0.52	1.90
SP	38	.95	141.4(19.68)	38-190	83-173	-1.51	1.86
MLD	16	.70	33.90(5.263)	16-80	24-51	0.69	0.11

Note. CN = Connectedness with nature scale; CFR = Cognitive flexibility inventory; SP = Spirituality measurement scale; MLD = Maladaptive daydreaming scale

The scale's psychometric qualities are displayed in Table 2. The Connectedness with Nature Scale (CN) showed acceptable internal consistency (α = .74). The Cognitive Flexibility Inventory (CFI) had relatively low reliability (α = .59). The Spirituality Measurement Scale (SP) demonstrated excellent reliability (α = .95). The Maladaptive Daydreaming Scale (MLD) showed acceptable reliability (α = .76). All scales exhibited skewness and kurtosis values within the acceptable range of ±1, indicating that the data were approximately normally distributed.

Table 3

Correlation of Connectedness with nature, Cognitive flexibility, Spirituality and Maladaptive daydreaming among university students (N= 200)

Variables	1	2	3	4
Connected with nature	-			
Cognitive flexibility	.43**	-		
Spirituality measurement	.71**	.55**	-	
Maladaptive daydreaming	-.47**	-.44**	-.45**	-

Note=**p<.01

Table 3 shows the Pearson correlation coefficient among connectedness with nature, cognitive flexibility inventory, spirituality measurement and maladaptive daydreaming. Connectedness with nature was positively correlated with cognitive flexibility (r =.438, p<.01) and spirituality (r = .711, p<.01), but negatively correlated with maladaptive daydreaming (r =-.479, p< 01). Cognitive flexibility inventory was positively correlated with spirituality (r = .550, p<.01) and negatively with maladaptive daydreaming (r = - .448, p<.01) similarly, spirituality had a negative correlation with maladaptive daydreaming (r = -.450, p<.01).

Table 4

Simple linear regression predicting Cognitive Flexibility from Connectedness with Nature (N=200)

	B	*SEB*	*β*	*t*	*P*
Constant	58.70	4.52	-	12.98	.001
Connectedness with Nature	0.65	0.09	.44	6.85	.001

Note. R= .44, R²= .19

Table 4 shows the result of a simple linear regression analysis examining the effect of Connectedness with nature on Cognitive flexibility. Table 4 shows that Connectedness with Nature significantly predicts Cognitive Flexibility. The regression model explains 19% of the variance in cognitive flexibility (R^2_a = .19), indicating a meaningful relationship between the two variables.

Table 5

Mediation of Spirituality in the relationship between Connectedness with nature and Cognitive flexibility (N = 200)

Predictor		Cognitive Flexibility				
	Model	R^2	β	p	t	95%BaCI
1	Constant		35.1	.001	4.66	[20.30, 50.02]
	Connectedness with Nature	.51	2.23	.001	14.2	[1.92, 2.54]
2	Constant		50.7	.001	11.46	[42.02, 59.47]
	Connectedness with Nature	.31	.14	.258	1.13	[-0.10, 0.38]
	Spirituality	.30	.22	.001	5.70	[0.14, 0.30]

Step 1 F = 128.30***; Step 2 indirect effect = .51

Note: R^2 = Explained variance, BaCI = Bias-corrected confidence interval

Table 5 presents the results of a mediation analysis examining the role of Spirituality in the relationship between Connectedness with Nature and Cognitive Flexibility among university students. In Model 1, Connectedness with Nature significantly predicted Cognitive Flexibility (β = 2.23, p .001), accounting for 50.54% of the variance. In Model 2, when Spirituality was added as a mediator, the direct effect of Connectedness with Nature on Cognitive Flexibility became non-significant (β = .14, p = .258), while Spirituality significantly predicted Cognitive Flexibility (β = .22, p < .001). The indirect effect was significant (β = .51) indicating that Spirituality mediates the relationship between Connectedness with Nature and Cognitive Flexibility.

Mediation Model

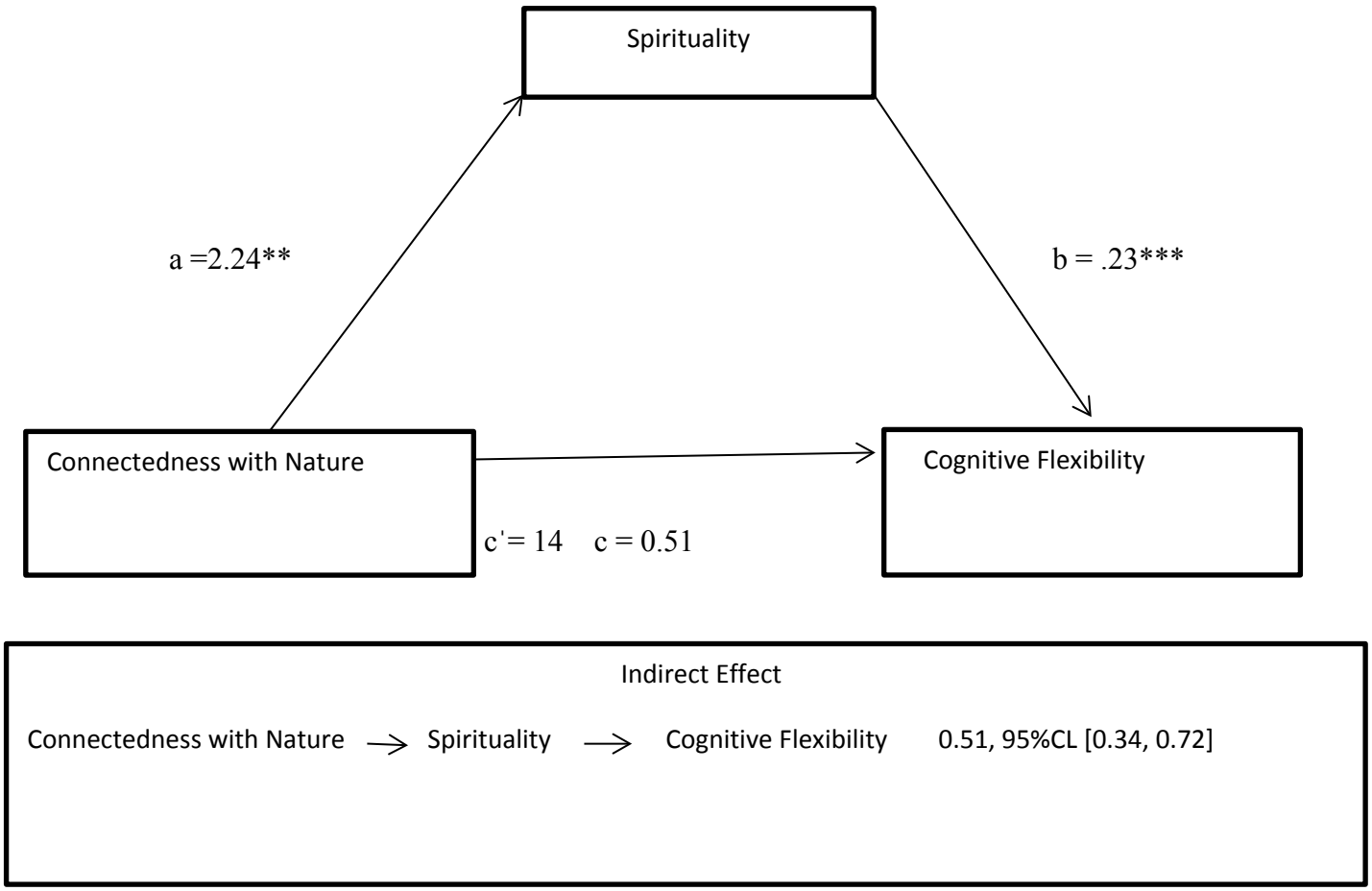

Figure 2: Path Diagram Illustrating the Mediation role of Spirituality in the Relationship between Connectedness with Nature and Cognitive Flexibility..

Table 6

Moderating role of Maladaptive daydreaming between the relationship of Connectedness with nature and Cognitive flexibility (N =200)

					95%CL	
	B	*SEB*	*t*	*P*	*LL*	*UL*
Constant	89.93	0.60	149.18	.001	88.74,	91.11
CN	-0.35	0.11	-3.20	.002	-0.56,	-0.13
MLD	-0.43	0.13	-3.27	.001	-0.69,	-0.17
CN*MLD	0.04	0.02	2.15	.003	0.00	0.06

Note; p<.05, p<.01 *CN*, Connectedness with Nature; *MD*, Maladaptive Daydreaming

Table show the interaction term between connectedness with nature and maladaptive daydreaming was statistically significant (*B* = 0.04. *P*= .033). This indicates that the strength of the association between connectedness with nature and cognitive flexibility depends on the level of maladaptive daydreaming. Both connectedness with nature (*B* = -0.35, *P* = .002) and maladaptive daydreaming (*B*= -0.43*, P*= .001) individually predicted cognitive flexibility.

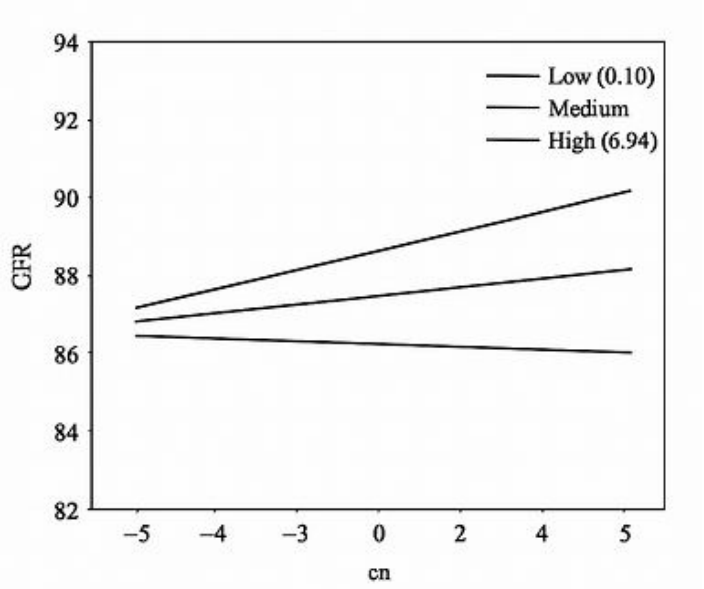

Figure 1. Moderation Effect of *mld* on the Relationship Between cn and CFR

Table 7

Independent sample t-test to investigate gender differences on Connectedness with Nature, Spirituality, Maladaptive Daydreaming, and Cognitive Flexibility among University Students

	Male (n=114)	Female (n=86)			*95% CI*		
Variables	*M (SD)*	*M (SD)*	*t(198)*	*p*	*LL*	*UL*	*Cohen's d*
Connectedness with Nature	46.85 (6.36)	48.47 (6.03)	-1.83	.069	-3.34	0.11	-0.24
Spirituality	33.16 (10.42)	37.84(10.56)	-3.29	.000	-7.41	-1.76	-0.44*
Maladaptive Daydreaming	35.82(17.17)	36.08(24.56)	-0.08	.000	-5.47	5.04	0.01
Cognitive Flexibility	90.36 (9.77)	92.72 (9.45)	1.86	.096	-4.88	0.13	-0.25

Note; CI = Confidence Interval; LL =Lower Limit; UL =Upper Limit

Table 7 shows the difference between male and female university students on connectedness with nature, cognitive flexibility, spirituality and maladaptive daydreaming. Female university students are higher on spirituality (*M*= 37.84, *SD=10.56)* and maladaptive daydreaming (*M*=36.08 *SD*=24.56*)* then male university students (*M*= 33.16, *SD*=10.42). Whereas there is non-significant difference between male and female university students on connectedness with nature and cognitive flexibility.

Table 8

Independent sample t- test to investigate difference on the basis of age on Connectedness with Nature, Spirituality, Maladaptive Daydreaming, and Cognitive Flexibility among University Students

	18-21 (n =71)	22-26 (n =129)			95% CI		
Variables	M (SD)	M (SD)	t(198)	p	LL	UL	Cohen's d
Connectedness with Nature	46.45(8.75)	48.15(4.24)	-1.85	.067	-3.51	.11	0.25
Spirituality	133.76 (24.52)	145.66 (14.92)	-4.26	.000	-17.40	-6.83	0.65
Maladaptive Daydreaming	34.48(7.06)	33.4(9.31)	1.53	.122	-0.28	2.73	0.21
Cognitive Flexibility	86.80(9.69)	90.88(8.68)	-3.05	.003	-6.81	-1.34	0.44

Note.CI = Confidence Interval; LL = Lower Limit; UL= Upper Limit

Above table 8 describe the results of mean differences based on age (18-21 years to 22-26 years) for connectedness with nature, spirituality, maladaptive daydreaming, and cognitive flexibility among university students. Students aged 22–26 years reported significantly higher on spirituality (M = 145.96, SD = 41.26) compared to those aged 18–21 years (M = 133.76, SD = 24.52). Similarly, older students significantly higher on cognitive flexibility (M = 89.58, SD = 8.05) than younger students (M = 86.00, SD = 9.60). There was a non-significant difference between younger (18–21 years) and older (22–26 years) university students on Connectedness with Nature.

Table 9

Independent sample t-test to investigate difference on the basis of educational level on Connectedness with Nature, Spirituality, Maladaptive Daydreaming, and Cognitive Flexibility among University Students

Variables	BS (n=127) M (SD)	MS (n=73) M (SD)	t(198)	p	95%CI LL	95%CI UL	Cohen's d
Connectedness with Nature	47.54(7.23)	47.55(4.11)	-0.01	.996	-1.81	1.81	0.00
Spirituality	141.39(22.76)	141.53(12.81)	-0.05	.963	-5.60	5.33	0.01
Maladaptive Daydreaming	35.12(5.96)	31.78(2.69)	4.52	.000	1.88	4.79	0.64
Cognitive Flexibility	89.55(10.52)	89.23(6.51)	0.23	.815	-2.36	3.00	0.03

Note.CI = Confidence Interval; LL = Lower Limit; UL= Upper Limit

Table 9 shows the difference between BS and MS university students on connectedness with nature, cognitive flexibility, spirituality, and maladaptive daydreaming. BS university students are higher on maladaptive daydreaming (M = 35.12, SD = 5.96) than MS university students (M = 31.78, SD = 2.69). Whereas there is non-significant difference between BS and MS university students on connectedness with nature, cognitive flexibility, and spirituality.

Table 10

Independent sample t-test to investigate difference on the basis of family type on Connectedness with Nature, Spirituality, Maladaptive Daydreaming, and Cognitive Flexibility among University Students

	Joint *(n=123)*	Nuclear *(n=76)*			*95%CI*		
Variables	*M(SD)*	*M(SD)*	*t(197)*	*p*	*LL*	*UL*	*Cohen's d*
Connectedness with Nature	48.41(5.15)	46.05(7.52)	2.62	.010	0.58	4.13	0.37
Spirituality	146.80(14.10)	132.67(24.06)	5.23	.000	8.80	19.47	0.77
Maladaptive Daydreaming	32.94(4.22)	35.41(6.37)	-3.28	.001	-3.95	-0.99	0.46
Cognitive Flexibility	89.95(7.26)	88.47(11.76)	1.00	.317	-1.49	4.45	0.14

Note.CI = Confidence Interval; LL = Lower Limit; UL= Upper Limit

Table 10 shows the difference between university students from joint and nuclear family systems on connectedness with nature, cognitive flexibility, spirituality, and maladaptive daydreaming. Students from joint families scored significantly higher on connectedness with nature (M = 48.41, SD = 5.15) and spirituality (M = 146.80, SD = 14.10) compared to students from nuclear families. Similarly, students from nuclear families scored significantly higher on maladaptive daydreaming (M = 35.41, SD = 6.37) than those from joint families (M = 32.94, SD = 4.22). Whereas there is non-significant difference between joint and nuclear family students on cognitive flexibility.

Chapter 4

Discussion

The current study sought to determine how university students' maladaptive daydreaming, spirituality, cognitive flexibility, and connection to nature relate to one another. Sample of the study was taken from different universities of Pakistan. The sample was comprised of university students (N=200) studying at undergraduate BS (Hons), and postgraduate MS/MPhil degree programs. Data of the present study was collected by using Connected with Nature Scale (Mayer & Frantz, 2003), Cognitive Flexibility Inventory (Dennis & Vander, 2010), Spirituality Measurement Scale (Makkah & Singh 2018) and Maladaptive Daydreaming Scale (Somer et al., 2017).

The overall pattern of findings demonstrates strong support for the theoretical foundations guiding this study. The results collectively suggest that spirituality and connectedness with nature function as important psychological resources that enhance cognitive flexibility, whereas maladaptive daydreaming operates as a disruptive internal process that weakens adaptive cognitive functioning. Rather than merely confirming statistical associations, these findings highlight the dynamic interplay between environmental engagement, inner awareness, and cognitive adaptability among university students.

The first hypothesis proposed a positive association between connectedness with nature and cognitive flexibility, and the findings strongly supported this expectation. Students who felt more emotionally and psychologically connected to nature demonstrated greater adaptability in their thinking. This relationship can be understood through Attention Restoration Theory, which posits that natural environments replenish depleted cognitive resources and support flexible, open-minded processing (Kaplan & Kaplan, 1997). When students experience nature as a source of calm, fascination, and mental clarity, they may be better equipped to shift perspectives, regulate attention, and respond effectively to academic

and emotional challenges. This interpretation aligns with earlier work showing that exposure to natural settings enhances executive functioning and psychological restoration (Berman et al., 2008; Kaplan, 2001).

The second hypothesis predicted a positive relationship between spirituality and connectedness with nature. The strong association observed in this study suggests that nature may serve as a pathway to spiritual awareness by evoking feelings of awe, meaning, and transcendence (Kamitsis & Francis, 2013). Ecopsychological perspectives emphasize that human well-being is deeply rooted in harmonious interaction with the natural world, a view reflected in many indigenous traditions but often overlooked in contemporary psychological models. Nature may foster a sense of belonging to something larger than oneself, thereby strengthening spiritual orientation. This interpretation is consistent with Ecopsychological Theory (Roszak, 1995), which argues that engagement with nature nurtures an ecological self-grounded in spiritual and biophysical interconnectedness.

The third and fourth hypotheses predicted negative associations between maladaptive daydreaming and both cognitive flexibility and connectedness with nature. These expectations were confirmed, indicating that individuals who engage in excessive, immersive daydreaming tend to be less cognitively adaptable and less attuned to their environment. Maladaptive daydreaming has been conceptualized as a form of dissociative absorption that replaces real-world engagement with internally generated fantasy (Somer, 2002). Such absorption can interfere with attentional control, emotional regulation, and the ability to shift cognitive sets (Bigelsen & Schupak, 2011; Soffer-Dudek, 2020). The present findings reinforce the idea that prolonged internal immersion reduces environmental awareness and limits the cognitive flexibility required for effective problem-solving. This interpretation

aligns with cognitive-attentional theories, which suggest that excessive inward focus diminishes executive control and attentional flexibility (McMillan et al., 2013).

The fifth hypothesis proposed that spirituality would mediate the relationship between connectedness with nature and cognitive flexibility. Full mediation was observed, indicating that nature connectedness enhances cognitive flexibility primarily through its influence on spirituality. This suggests that nature may cultivate spiritual qualities such as meaning, acceptance, and inner coherence that subsequently support flexible thinking. Prior research has shown that spirituality contributes to psychological resilience, emotional regulation, and adaptive coping (Piedmont, 1999; Saroglou, 2011). Individuals with higher spiritual awareness often demonstrate openness, self-reflection, and acceptance traits that facilitate cognitive flexibility (Dennis & Vander Wal, 2010). The mediation pathway highlights spirituality as an internal integrative mechanism that transforms environmental engagement into cognitive benefits. This interpretation is consistent with positive psychology and transpersonal perspectives, which emphasize that spiritual awareness fosters emotional balance, coherence, and meaning factors that enhance mental adaptability (Garland et al., 2015). Practically, this suggests that interventions promoting spiritual reflection, mindfulness, or contemplative nature experiences may strengthen cognitive flexibility among students.

The sixth hypothesis predicted that maladaptive daydreaming would moderate the relationship between connectedness with nature and cognitive flexibility. The moderation effect was confirmed: the positive influence of nature connectedness on cognitive flexibility weakened at higher levels of maladaptive daydreaming. This finding suggests that individuals who frequently detach into fantasy may struggle to translate their emotional connection with nature into cognitive benefits. Maladaptive daydreaming appears to function as a cognitive barrier that disrupts the attentional and emotional processes required to benefit from nature's

restorative effects. This interpretation aligns with research describing maladaptive daydreaming as a form of cognitive disengagement that interferes with real-world attention and flexibility (Soffer-Dudek & Somer, 2018). From a broader theoretical standpoint, the moderation effect underscores the importance of balancing internal cognitive processes with external awareness for optimal functioning, as emphasized in self-regulation and attentional control theories (Baumeister et al., 2007).

Demographic patterns in the sample further contextualize these findings. The predominance of participants aged 22–26 suggests that many were in later stages of university education, which may explain the higher cognitive flexibility observed among older students. Greater academic exposure and life experience likely contribute to more adaptive thinking. BS students reported higher maladaptive daydreaming than MS students, possibly reflecting heightened academic stress or emotional escapism among younger learners. Gender differences revealed that females scored higher on spirituality, consistent with literature indicating greater emotional and spiritual sensitivity among women. Family structure also played a meaningful role: students from joint families reported higher spirituality and nature connectedness, whereas those from nuclear families showed elevated maladaptive daydreaming. These patterns may reflect differences in social support, emotional bonding, and exposure to shared family environments.

The differences between students from joint and nuclear families also reflect culturally embedded dynamics. Joint families in Pakistan traditionally emphasize collectivism, shared responsibilities, and strong intergenerational bonds. These environments often promote emotional closeness, communal values, and spiritual practices that are reinforced through daily interactions with elders. Such settings may naturally cultivate higher spirituality and a stronger sense of connectedness with nature, as joint families often maintain

traditional lifestyles, shared outdoor spaces, and collective routines that keep individuals more grounded in cultural and environmental values.

In contrast, students from nuclear families showed higher maladaptive daydreaming, which may be linked to greater emotional isolation, reduced social support, and increased individual responsibility. Nuclear family structures, which are becoming more common in urban Pakistan, often involve busier parental schedules and less communal interaction. This may lead some students to rely more on internal fantasy as a coping mechanism. Additionally, nuclear families tend to adopt more modern, technology-driven lifestyles with fewer opportunities for outdoor engagement, which may weaken nature connectedness and increase reliance on solitary mental escape.

Overall, the findings align with previous research demonstrating the restorative influence of nature on psychological functioning (Cervinka et al., 2012; Mayer et al., 2009) and the role of spirituality in fostering self-transcendence and psychological growth (Bragg, 1996; Howell et al., 2011). The detrimental impact of maladaptive daydreaming on cognitive functioning is also consistent with studies linking excessive fantasy to reduced well-being and impaired executive control (Somer, 2016; Pietkiewicz et al., 2018). Together, these results highlight the complex interplay between environmental engagement, spiritual awareness, and internal cognitive processes in shaping students' cognitive flexibility.

Limitations and Suggestion

- English versions of questionnaire were used in present study and were explained by the researcher to participant as participants were found some difficulty in understanding wording of questionnaire. To address this

limitation future study should consider translating the questionnaire into the participants' native language.

- Students of BS level not fully understand the statements of these variables to address this limitation participants must holding MS degree programs should consider in future study so that they can easily understand these study variables.
- Self-report assessments may be impacted by social desirability bias, and causal inference is limited by the cross-sectional design. Because only Pakistani university students were included in the sample, it was not as generalizable to other age or cultural groups. To investigate causal pathways and take into account a variety of populations, future research should use experimental or longitudinal approaches.
- Other psychological mediators, including emotional intelligence or mindfulness, may also be examined in future research on the connection between cognitive outcomes and nature connectedness.

Implication

By showing how spirituality, maladaptive daydreaming, and a connection to nature all affect cognitive flexibility, the current study's findings add significant knowledge to the domains of positive and environmental psychology. The findings emphasize that while maladaptive daydreaming acts as a hindrance to these adaptive processes, spirituality and a connection to nature are important psychological resources that improve emotional regulation and adaptability. The study has ramifications for counseling and clinical practice as well. When working with clients who engage in high amounts of maladaptive daydreaming, therapists may use attention-training techniques and grounding techniques to help them re-establish a connection with the present. Reducing escapist tendencies and encouraging

healthier cognitive engagement may be achieved by including nature exposure into treatment practices. Educational institutions may think about including modules on spiritual and environmental well-being in their curricula at the policy level. Promoting green spaces, sustainable campus surroundings, and reflective practices can improve pro-environmental behavior and mental health.

Lastly, these results expand the theoretical knowledge of how cognitive adaptability is influenced by the interaction between internal psychological states and contextual connection. A multifaceted approach to mental health and education is provided by the integration of ecological psychology, spirituality, and cognitive flexibility frameworks, which emphasize balanced involvement with the inner and outer worlds and holistic growth.

Conclusion

The current study set out to explore the relationships among spirituality, cognitive flexibility, connectivity to nature, and maladaptive daydreaming among university students. The study also examined the mediating role of spirituality and the moderating effect of maladaptive daydreaming in the relationship between cognitive flexibility and a sense of connection to nature. The findings showed that Cognitive Flexibility was significantly predicted by Connectedness with Nature, suggesting that people who have a strong emotional and psychological bond with nature are more likely to think more openly and adaptably. Additionally, it was discovered that spirituality completely mediated this link, indicating that increased spiritual awareness and meaning-making are the mechanisms by which nature's beneficial effects on cognitive flexibility work. Maladaptive daydreaming, on the other hand, was shown to have a negative correlation with both cognitive flexibility and connectedness to nature, indicating that it has a negative effect on adaptive cognitive processes.

Furthermore, the moderation analysis showed that higher levels of maladaptive daydreaming reduce the favorable relationship between cognitive flexibility and

connectedness with nature, suggesting that excessive fantasy immersion impairs cognitive adaptability and real-world engagement. Overall, the results show that while maladaptive daydreaming operates as a limiting factor that limits the restorative and cognitive benefits of nature, spirituality acts as an inner psychological bridge that transforms these benefits into adaptive adaptability. By combining viewpoints from environmental psychology, cognitive flexibility theory, and mindfulness-based frameworks, these findings advance theoretical understanding. Reducing maladaptive cognitive tendencies and enhancing psychological well-being can be achieved through counseling and educational initiatives that emphasize mindfulness, spending time in nature, and engaging in spiritual introspection. In summary, the current study emphasizes how important it is to strike a balance between ambient connectedness and interior awareness in order to attain cognitive and emotional balance. This study advances our knowledge of how people can achieve more mental flexibility, resilience, and psychological development by acknowledging the combined influence of spirituality and maladaptive daydreaming.

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Annex. A

Informed Consent Form

Respected Respondents, I am a student of MS-Psychology from International Islamic University Islamabad. I am conducted a research on university students between the ages of 18- 26. The present study aimed to find the relationship between connectedness with nature, cognitive flexibility, spirituality and maladaptive day dreaming. In order to achieve this purpose your cooperation will be highly required and appreciated.

Therefore, it is requested to fill the below mentioned form on the basis of your experience and personal views. While the information provided by you will be kept confidential and completely anonymous and will be solely used for the research purpose. The consent form also allows you the privilege of right to withdraw from the process at any point where you don't want to participate any further. However it will be grateful if you fill this questionnaire till the end.

Participant's signature_____

Annex. B

Demographics Sheet

Instructions: Please fill the following details. Your responses will be kept confidential and will be used for research purposes only.

Age: 18 to 20 \ 21 to 26

Gender: Male / Female

Education: BS / MS

Marital Status: Married \ Unmarried

Family Type: Joint \ Nuclear

Annex. C

Letter of Data Collection

الجامعة الاسلامية العالمية
International Islamic University Islamabad, Pakistan
P.O. Box 1243, Islamabad, Pakistan Tel: 051-9019249, 9257919 Fax: 051-9257611 www.iiu.edu.pk

Respected Sir/Madam

It is certified that Ms. Nudrat Ejaz, Registration number 343-FSS/MSEP/F23 is the student of Department of Psychology, Faculty of Social Sciences, International Islamic University Islamabad. Kindly allow her to collect data for her thesis from your prestigious institute for the partial fulfillment of her degree. The information will be kept confidential and ethical concerns swill be followed.

Your cooperation in this regard will be highly appreciated.

Dr. Mussarat Jabeen

Assistance Professor

Department of Psychology,

International Islamic University Islamabad

Annex. D

Connectedness with Nature Scale (CNS)

Following scale measures Connectedness to Nature. Carefully read the statement given below and select the option best relevant to you. Connectedness to Nature Scale (CNS) .There is no right or wrong answers. Please answer as honestly and candidly as you can.

	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I often feel a sense of oneness with the					

	natural world around me.					
2	I think of the natural world as a community to which I belong.					
3	I recognize and appreciate the intelligence of other living organisms.					
4	I often feel disconnected from nature.					
5	When I think of my life, I imagine myself to be part of a larger cyclical process of living.					
6	I often feel a kinship with animals and plants.					
7	I feel as though I belong to the Earth as equally as it belongs to me.					
8	I have a deep understanding of how my actions affect the natural world.					
9	I often feel part of the web of life.					
10	I feel that all inhabitants of Earth, human, and nonhuman, share a common "life force".					
11	Like a tree can be part of a forest, I feel embedded within the broader natural world.					
12	When I think of my place on Earth, I					

	consider myself to be a top member of a hierarchy that exists in nature.					
13	I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.					
14	My personal welfare is independent of the welfare of the natural world.					

Annex. E

Cognitive Flexibility Inventory (CFI)

Following scale measures Cognitive Flexibility. Carefully read the statement given below and select the option best relevant to you.

	Items	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

1	I am good at ‘‘sizing up’’ situations.							
2	I have a hard time making decisions when faced with difficult situations.							
3	I consider multiple options before making a decision.							
4	When I encounter difficult situations, I feel like I am losing control.							
5	I like to look at difficult situations from many different angles.							
6	I seek additional information not immediately available before attributing causes to behavior.							
7	When encountering difficult situations, I become so stressed that I cannot think of a way to resolve the situation.							
8	I try to think about things							

	from another person's point of view.							
9	I find it troublesome that there are so many different ways to deal with difficult situations.							
10	I am good at putting myself in others' shoes.							
11	When I encounter difficult situations, I just don't know what to do.							
12	It is important to look at difficult situations from many angles.							
13	When in difficult situations, I consider multiple options before deciding how to behave.							
14	I often look at a situation from different view-points.							
15	I am capable of overcoming the difficulties in life that I face.							
1	I consider all the available							

6	facts and information when attributing causes to behavior.							
17	I feel I have no power to change things in difficult situations.							
18	When I encounter difficult situations, I stop and try to think of several ways to resolve it.							
19	I can think of more than one way to resolve a difficult situation I'm confronted with.							
20	I consider multiple options before responding to difficult situations.							

Annex. F

Spirituality Measurement Scale (SMS)

Following scale measures Spirituality. Carefully read the statement given below and select the option best relevant to you.

	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	I engage in Meditation.					
2	Spirituality is a holistic approach that embraces all, under one super natural being.					
3	I have awareness about my career.					
4	Spirituality creates an atmosphere of positivity.					
5	I engage in Spiritual singing					
6	Spirituality relates to a person's search for finding greater meaning in one's existence.					
7	I give my time to help others.					
8	Spirituality is a feeling of oneness with all living beings.					

9	I have awareness about my aspirations.					
10	I engage in Chanting Mantras.					
11	Spirituality is utilizing the power of the rational mind for the benefit of the society.					
12	I have a meaningful life.					
13	I have awareness about my spirit.					
14	I sacrifice my personal ego needs to do what best serves others.					
15	Spirituality is a belief, that we all derive the supreme power from one common source.					
16	I attend spiritual workshops/activities/events.					
17	Spirituality promotes togetherness among all beings.					
18	I am aware about my					

	desires.					
19	Spirituality promotes peaceful living.					
20	I have confidence in my actions.					
21	Spirituality is being connected with divinity.					
22	Most of the time, I have a positive approach.					
23	Spirituality is what keeps people anchored to happiness.					
24	I am a self-content person.					
25	Spirituality helps in realizing one's higher purpose in life.					
26	I am aware about my daily needs.					
27	Spirituality is the spirit of keep going and not giving up.					
28	I give my material resources to help others.					
29	Spirituality helps in having					

	clarity in life.					
30	I have awareness about my body.					
31	Spirituality enhances healthy lifestyle.					
32	The progression of my life is as expected.					
33	Spirituality is working together to resolve conflicts in a positive way.					
34	I am satisfied with my life, as a whole.					
35	Spirituality helps in reducing depression.					
36	I have awareness about my family.					
37	Spirituality is bowing before His will without any doubt.					
38	Spirituality spreads the message of unity in diversity.					

Annex. G

Maladaptive Daydreaming Scale (MDS)

The following scale measures maladaptive daydreaming. Carefully read the statement given below and select the option best relevant to you.

1=Never 2= Sometimes 3=Most of the time 4= Always

	Items	0% Never	35% Sometimes	70% Most of the time	100% Always
1	Some people notice that certain music can trigger their daydreaming. To what extent does music activate your daydreaming?				
2	Some people feel a need to continue a daydream that was interrupted by a real world event at a later point. When a real world event has interrupted one of your daydreams, how strong was your need or urge to return to that daydream as soon as possible?				
3	How often are your current daydreams accompanied by vocal noises or facial expressions (e.g. laughing, talking or mouthing the words)?				
4	If you go through a period of time when you are not able to daydream as much as usual due to real world obligations, how distressed are you by your inability to find time to daydream?				

5	Some people have the experience of their daydreaming interfering with their daily chores or tasks. How much does your daydreaming interfere with your ability to get basic chores accomplished?				
6	Some people feel distressed or concerned about the amount of time they spend daydreaming. How distressed do you currently feel about the amount of time you spend daydreaming?				
7	When you know you have had something important or challenging to pay attention to or finish, how difficult was it for you to stay on task and complete the goal without daydreaming?				
8	Some people have the experience of their daydreaming hindering the things that are most important to them. How much do you feel that your daydreaming activities interfere with achieving your overall life goals?				
9	Some people experience difficulties in controlling or limiting their daydreaming. How difficult has it been for you to keep your daydreaming under control?				
10	Some people feel annoyed when a real world event interrupts one of their daydreams. When the real world interrupts one of your daydreams, on average how annoyed do you feel?				
11	Some people have the experience of their daydreaming				

	interfering with their academic/occupational success or personal achievements. How much does your daydreaming interfere with your academic/occupational success?				
12	Some people would rather daydream than do most other things. To what extent would you rather daydream than engage with other people or participate in social activities or hobbies?				
13	When you first wake up in the morning, how strong has your urge been to immediately start daydreaming?				
14	How often are your current daydreams accompanied by physical activity such as pacing, swinging or shaking your hands?				
15	Some people love to daydream. While you are daydreaming, to what extent do you find it comforting and/or enjoyable?				
16	Some people find it hard to maintain their daydreaming when they are not listening to music. To what extent is your daydreaming dependent on continued listening to music?				

Annex. H

Plagiarism Report