



The Resilient Mind: Cognitive Flexibility and Rumination

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Abstract: This study explores how resilient behaviors and cognitive adaptability intertwine with repetitive thoughts (Rumination) and assessed gender differences Among 76 young adults with data collected through the Cognitive Flexibility Inventory Scale, The Resilience Scale (RS-25) and The Rumination Scale. One noteworthy finding from this study is that “Women exhibited more Cognitive flexibility and better recovery from stress, showing a strong link between coping skills and mental adaptability.” Indeed, correlation between adaptability and resilience was especially evident among female participants. The link between stronger resilience and thought patterns emerged clearly when considering gender roles. Where one sees challenges, others may encounter threats; yet flexibility played a notable role in shaping reactions. With better recovery, people showed reduced fixation on what-ifs and past failures. Recovery didn't just offset strain - it altered how strain felt. The interplay between ability to reframe challenges and ability to bounce back grew clearer as analysis refined outcomes by gender. Despite differences in age the sample shows little evidence of disparity among men and women in measures of adaptability and resilience. In stark contrast however females demonstrate a clearly different profile on measures of ruminative thinking with significantly higher average scores found amongst females than male subjects overall this finding highlights the importance of developing mental health supports focused specifically around building adaptability and reducing ruminative thinking in young

adults; which is a crucial step in improving long term mental health. The future Research should further Investigates specific interventions that can enhance resilience and flexibility while reducing rumination to improve overall individual well-being.

Keywords: *Resilience, Cognitive Flexibility, Rumination, Gender Differences, Young Adults.*

1. Introduction

1.1 Resilience

The word resilience originated from the Latin word ‘Resilire’ which means to lean back. It is linked to stressful situations and people's coping ability. Resilience refers to positive adaptation of the adverse situations of your life and to maintaining mental health. A lot of factors are important in the concept of resilience. It can be enhanced from the social support we receive and the connections that are true of us.

Individuals are able to cope up with the adverse or difficult situations in their life. Their coping skills are majorly developed early in their life and the different parts of the brain plays the most important role in adaptation to the difficult situations. Thus, it can be inferred that the growth of a person towards difficult situations in their early lives helps them in providing a strong and basic foundation to deal with difficult times. The social sciences by and large characterize resilience as the capacity to deal with negative life experiences as well as overcoming them (Henderson & Milstein, 1996). The concept of resilience is not straightforward and includes other factors as well. Resilience is not only the thriving or surviving in the difficult times but also what we learnt from those stressful or difficult experiences.

Definitions of Resilience

According to Luthans (2002), Resilience is defined as “the developable capacity to rebound or bounce back from adversity, conflict, and failure or even positive events, progress, and increased responsibility.”

According to Ledesma (2014), resilience is defined as “the ability to bounce back from adversity, frustration, and misfortune.”

The definitions of resilience can be grouped into two categories:

1. Resilience as a personal trait
2. Resilience as a process

Resilience as a personal trait

According to this group, resilience is defined as a collection of certain personal traits. A lot of researchers defined resilience as the capacity of the individual to overcome, thrive, bounce back and be positively able to adapt to many difficult and stressful situations (Kirby & Fraser, 1997; Minnard, 2002). Thus, from this viewpoint of definitions, resilience is considered as the capacity to adapt and overcome the stressful situation positively rather than the individuals seen as those who suffer from adversity. These definitions clearly suggest that an individual has to develop resilience. As per Lopez, Prosser, and Edwards (2002), individuals who have resilience as their trait have more chances of surviving in the situations where the circumstances are very difficult.

Resilience as a process

From this perspective, resilience is defined as a dynamic process. The focus of the resilience research is to know about the mechanisms of dealing with adversity rather than the key basic factors which enhance resilience. Resilience has been described as a process of adapting to adversity positively during the threat or following a stressful situation (Masten, Burt & Coatsworth, 2006). According to Fonagy et al. (1994), resilience is neither an individual attribute nor it is acquired during the process of development. Rather they define resilience as an interaction of the social and individual's psychic processes which includes the family, individual, and the social environment. One of the most common and basic definitions relies on two different dimensions: experience adversity and the positive adaptation (Luthar, 2006). One dimension that the person must experience or face adversity or a stressful situation which carries them risk for the development of mental disorders. The second dimension focuses on the adjustment or adaptation toward that adversity in a very positive manner and tries to maintain as well as generate that positivity in the individual. Hence, resilience can't be measurable in its direct form, but we can measure it indirectly from these two basic dimensions. A lot of researchers have accepted these two constructs (Masten, 2001; Sroufe et al., 2005).

1.2 Rumination

If you were sitting vacant and started thinking about the heated conversation between you and your friend yesterday. The negative thoughts and feelings trigger you again and again which in turn puts your mood upset. This makes you feel distressed and hopeless. As well you will not be able to find the solution and put yourself down.

Rumination: it is a cognitive process, where an individual continuously thinks about the

negative thoughts, events and emotions. As well analyzing its causes and consequences. It negatively goes to affect one's physical and mental health.

There are two aspects of rumination:

Cognitive Aspects: highly focusing on one's own thoughts, feelings and experiences. Not focusing on the solution, just wandering in the negative thoughts and overthinking regarding that particular thought. It deteriorates the reality perspective. Rumination is highly associated with the increased activity in the prefrontal cortex, where the cycle of rumination gets heightened.

Emotional Aspects: involves getting sad, anger and anxiety. These emotions are triggered by the thinking of negative events and experiences. It reduces our ability to regulate our emotions. It leads to depression and anxiety. As well the feelings of hopelessness and helplessness.

Types of Rumination

Reflective Rumination

It includes problem-solving and analytical thinking. It involves reflecting back on past events and analyzing them in an elaborative manner to get insight and understanding. This is a positive kind of rumination which helps an individual's personal growth and development. It helps to introspect and analyze our own past behavior and make possible changes. It improves the decision making in our future whatever we learned from the previous mistakes. An increased level of reflective rumination leads to negative feelings and thoughts.

Brooding Rumination

Brooding rumination is that type of thinking where an individual was highly focused on the negative events and self-monitoring. This thinking pattern goes to repeat and bring the negative feelings and thoughts of helplessness and hopelessness. It deteriorates one's mental health and leads to depression and anxiety. It reduces the ability of decision making and problem-solving. The development of negative thoughts was much higher than the ability of finding the solutions.

Intrusive rumination

when we are in an uncontrollable manner and unintentionally engaged in thinking of the negative events or experiences regardless how hard we want to stop this. This leads to distress and is impossible to overcome from those unwanted thoughts.

Deliberative rumination

When the whole attention goes to focus on the causes of the negative thoughts, events, problems or experiences. Try to find the why of every thought. People go to satisfy themselves by

explaining causes.

Effects on physical health: Headache, Insomnia, Weak immune system, Digestive system

Effects on mental health: Difficulty in problem solving, Depression, Anxiety, Low self esteem

1.3 Cognitive Flexibility

It refers to the ability of our brain to adapt to new, changes, or unplanned events. Cognitive flexibility refers to the ability of an individual to work and switch in multiple tasks simultaneously. As well changing oneself according to changes in tasks. According to Scott (1962) switching in one's behavioural responses according to the different contexts of the situations.

The brain regions involved during the cognitive flexibility are:

- Prefrontal cortex
- Anterior cingulated
- Posterior parietal cortices
- Basal ganglia (Leber et al., 2008).

Cognitive flexibility declines with age and often results in an inability to adapt to new situations and environments. The Wisconsin card sorting task, which requires individuals to adapt to new rules, shows that normal aging decreases cognitive flexibility in humans (Boone et al., 1993). Individuals with mild cognitive impairment (MCI), an intermediate stage between normal aging related memory changes and Alzheimer's disease, exhibit even further impairment in cognitive flexibility (Ballesteros et al., 2013). Aged nonhuman primates also exhibit cognitive flexibility deficits when tested in a conceptual set-shifting task similar to the Wisconsin card sorting test (Moore et al., 2006). Age-related deficits in cognitive flexibility have been identified in rodents by assessing reversal learning; in these studies, impaired cognitive flexibility has been associated with changes in the prefrontal cortex (Schoenbaum et al., 2006). These changes include declines in expression of NMDA and kainate-type ionotropic glutamate receptors, as well as impaired dopaminergic function (Nicolle and Baxter, 2003; Mizoguchi et al., 2010). These neurotransmitter systems could potentially be targeted in developing therapies to combat the decline observed in cognitive flexibility in the elderly.

2. Review of Literature

Interplay of Psychological Constructs

The complex relationship between cognitive flexibility, resilience, and emotional well-

being has been a focal point of recent psychological research. Soltani et al. (2013) explored the association between cognitive flexibility, depression, coping styles, and resilience among 277 participants selected via cluster sampling. Their statistical analysis revealed that cognitive flexibility acts as a crucial mediator; specifically, it is negatively correlated with depression and positively correlated with resilience, suggesting that the ability to adapt one's thinking is fundamental to maintaining mental health.

Resilience and Rumination in Relationship Contexts

The mediating roles of resilience and rumination have also been extended to interpersonal dynamics. Gönültaş and Bayar (2024) investigated the relationship between forgiveness and marital adjustment in a sample of 494 married individuals (352 females and 137 males, aged 18 to 65). Their findings indicated that both rumination and resilience function as significant mediators between marital adjustment and forgiveness, highlighting a strong correlation between these variables in the context of long-term partnerships.

Cognitive Flexibility and Emotional Regulation

The connection between cognitive flexibility and maladaptive thought patterns like rumination has been further scrutinized using intensive longitudinal methods. One study examined these variables alongside anxiety in 44 participants (ages 18–42) using the Experience Sampling Method (ESM). By tracking daily changes in emotion and thought, the researchers identified a significant relationship between cognitive flexibility and the tendency to ruminate, suggesting that lower cognitive shifting may exacerbate repetitive negative thinking.

Gender Differences in Psychological Variables

Recent literature consistently highlights distinct gender variations across resilience, cognitive flexibility, and rumination.

- ***Resilience:*** In a study of urban adults in India, Goswami, Brahmi, and Sharma (2024) utilized t-tests to examine a sample of 200 participants (100 males, 100 females) aged 20 to 25. Their results revealed a significant gender difference, with males demonstrating higher levels of resilience compared to females.
- ***Cognitive Flexibility and Emotional Expressivity:*** Supporting these findings, Wang et al. (2022) explored gender differences in cognitive flexibility and emotional expressivity. Their results indicated that while females reported higher levels of emotional expressivity and pleasure (both anticipatory and consummatory), males exhibited significantly better

cognitive flexibility.

- ***Rumination and Stress:*** Conversely, research focusing on the onset of these differences in adolescence suggests higher vulnerability in females. Jose and Brown (2008) conducted a large-scale study of 1,218 adolescents to determine when gender disparities emerge. Their findings showed that females reported higher levels of stress, rumination, and depression than their male counterparts, marking a critical divergence in emotional processing styles.

3. Methodology

3.1 Problem

The study aims to examine Relationship between Resilience, Cognitive flexibility and Rumination among College Students.

3.2 Objectives

The primary objectives of this study are categorized into two domains: examining variable relationships and assessing demographic differences.

Relationship Assessment

- To investigate the relationship between Resilience and Cognitive flexibility.
- To investigate the relationship between Resilience and Rumination.
- To investigate the relationship between Cognitive flexibility and Rumination.

Gender Difference Assessment

- To assess gender differences in levels of resilience.
- To assess gender differences in cognitive flexibility.
- To assess gender differences in rumination.

3.3 Hypotheses

- **H1:** There shall be a positive relationship between resilience and cognitive flexibility.
- **H2:** There shall be a negative relationship between resilience and rumination.
- **H3:** There shall be a negative relationship between cognitive flexibility and rumination.
- **H4:** There shall be significant gender differences in resilience.
- **H5:** There shall be significant gender differences in cognitive flexibility.
- **H6:** There shall be significant gender differences in rumination

3.4 Research Design

This study adopted a quantitative correlational design to examine the relationship between resilience, rumination and cognitive flexibility.

3.5 Participants and Sampling

- **Sample Size:** A total of 76 young adults were included in the study.
- **Demographics:** The participants were young Indian adults within the age range of 18 to 25 years.
- **Geographical Location:** The data was collected from the city of Chandigarh.
- **Sampling Technique:** A convenience sampling technique was utilized for data collection, allowing for accessible and efficient gathering of participant information within the target region.

3.6 Statistical Tools and Analysis

To evaluate the data and test the proposed hypotheses, the following statistical software and methods were employed:

- **Software:** SPSS version 16.0 was used for all data entry and statistical computations.
- **Statistical Techniques:**
 - **Pearson Correlation:** Conducted to investigate the direction and strength of the relationships between resilience, cognitive flexibility, and rumination.
 - **Independent Samples t-test:** Utilized to assess and compare significant differences between male and female participants across the three primary variables.

3.7 Tools of Measurement:

The following standardized scales were utilized to measure the study variables:

1. **The Cognitive Flexibility Inventory (CFI):** Developed by Dennis and Vander Wal (2010).
2. **The Resilience Scale (RS-25):** Developed by Wagnild and Young (1993).
3. **The Rumination Scale:** Developed by Susan Nolen-Hoeksema (2003)

4. Statistical Analysis

4.1 Results

Table 1: Descriptive statistic shows the sample size, mean and SD of resilience, cognitive flexibility and rumination

Variable	N	Mean	SD
Resilience	76	1.31	24.49
Cognitive flexibility	76	97.78	15.63
Rumination	76	56.05	12.28

Table 2: Shows correlation of Resilience, Cognitive flexibility and Rumination

	Resilience	Cognitive flexibility	Rumination
Resilience	1	.707**	-.115
Cognitive flexibility		1	-.207
Rumination			1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3: Shows gender differences in Resilience, Cognitive flexibility and Rumination

Variable	t-value	df	sig. (2 tailed)	Mean difference	Standard error
Resilience	-.349	74	.728	-1.97	5.65
Cognitive flexibility	-.117	74	.908	-.42	3.61
Rumination	2.29	74	.024	6.57	2.86

4.2 Discussion of Result

Relationship between Variables (H1, H2, H3)

- **Resilience and Cognitive Flexibility (H1):** A strong positive association ($r = .707$) was found between resilience and cognitive flexibility. This indicates that as resilience increases, cognitive flexibility also tends to improve. These results align with findings by Artawijaya and Supratiwi (2024), their study explored the role of cognitive flexibility in enhancing resilience among Indonesian adolescents, using a cross-sectional research design titled “Cognitive flexibility and resilience in adolescents: Exploring gender differences and cultural implications. The findings revealed a significant positive

relationship between cognitive flexibility and resilience, indicating that cognitive flexibility is a crucial predictor of resilience. The study also identified significant gender differences in resilience, with male adolescents exhibiting higher resilience levels than females. These results align with existing research, emphasizing the importance of cognitive flexibility in psychological well-being and stress management therefore, H1 is accepted.

- **Resilience and Rumination (H2):** A significant negative association was observed between resilience and rumination. This suggests that more resilient individuals engage in less rumination. These findings are consistent with Mulawarman et al. (2024); The results of this study showed that resilience had a significant negative effect on students' cognitive rumination and contributes 79,3% to cognitive rumination, so students who have high resilience are not easy to get caught up in negative rumination and remain productive in carrying out their academic activities. Further implications of this research for the field of guidance and counseling studies in higher education are to provide an initial foundation for digging deeper into aspects that can increase resilience in college students through experimental research therefore, H2 is accepted.
- **Cognitive Flexibility and Rumination (H3):** The results revealed a significant negative association between cognitive flexibility and rumination. This implies that greater cognitive adaptability is linked to a reduction in repetitive negative thinking. These results are supported by Bhardwaj et al. (2024); This study explored the predictive role of cognitive flexibility and optimism on academic burnout and perceived stress among Bangladeshi medical students. cognitive flexibility and optimism significantly predicted both burnout and perceived stress, with cognitive flexibility emerging as the stronger predictor in both models. Independent samples t-tests showed significant gender differences in cognitive flexibility and perceived stress, with males scoring higher in flexibility and females reporting more stress. No significant gender differences were found in optimism or burnout. These findings suggest that cognitive flexibility and optimism may act as protective psychological resources, buffering against stress and burnout among medical students. Interventions aimed at enhancing these traits could promote mental well-being and resilience in high-pressure academic environments. therefore, H3 is accepted.

Gender Differences (H4, H5, H6)

- **Resilience and Cognitive Flexibility (H4 & H5):** The analysis showed insignificant differences between males and females regarding resilience and cognitive flexibility. These findings are similar to those reported by Lonkar (2024). His work emphasized that cognitive flexibility acts as a vital predictor for psychological resilience and stress management. However, when specifically examining gender differences, H4 and H5 are rejected.
- **Rumination (H6):** Significant gender differences were found in rumination, with females scoring significantly higher than males. This aligns with the work of Brown (2008), rumination explained the gender difference in depression by showing that it significantly mediated the effect of gender on depression. Gender moderated the rumination to depression relationship; specifically, the association was stronger for females than males. Developmental differences were noted in that rumination significantly mediated between stress and depression earlier in the age range for females than males. Thus, H6 is accepted.

5. Conclusion and Future Implications

The purpose of this study was to investigate the relationship between a resilient mind, cognitive flexibility, and rumination, while examining gender differences among young Indian adults. Understanding these variables is essential for identifying the nature of psychological issues in this demographic and developing feasible interventions.

The findings conclude that resilience and cognitive flexibility are positively associated, while both are negatively associated with rumination. Significant gender differences exist specifically in rumination, where females exhibit higher levels, whereas resilience and cognitive flexibility appear relatively stable across genders.

Implications

- **Health and Adaptability:** This study contributes to the understanding of how resilience and cognitive flexibility support situational adaptation and long-term health in young adults.
- **Mental Health Risks:** High levels of rumination serve as a predictor for depression and anxiety, emphasizing the need for targeted psychological support.

- **Future Research:** Subsequent studies should investigate specific interventions that can enhance resilience and flexibility while reducing rumination to improve overall individual well-being.

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