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Perceived Stress and Decision-Making Ability: The Moderating Role of Cognitive Flexibility Among University Students

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Abstract

Purpose: Perceived stress negatively affects decision-making ability among university students, while cognitive flexibility may help mitigate its impact. This study examines the moderating role of cognitive flexibility in the relationship between perceived stress and decision-making ability among Pakistani university students, grounded in Cognitive Flexibility Theory.

Methodology: A cross-sectional correlational design was employed, using purposive sampling to recruit 142 university students in Pakistan (men and women), aged 18–30 years (M = 23.97, SD = 3.74) from public and private universities in Karachi, Islamabad, Rawalpindi, and Lahore. Standardized instruments included the Perceived Stress Scale (PSS-10), Cognitive Flexibility Inventory (CFI), and Melbourne Decision-Making Questionnaire (MDMQ). Data were analyzed using Pearson correlations and moderation analysis via Hayes' PROCESS macro (Model 1).

Findings: Perceived stress was significantly negatively correlated with decision-making ability ($r = -.61$, $p < .01$), while cognitive flexibility had a positive but non-significant relationship with decision-making. Moderation analysis revealed that cognitive flexibility significantly moderated the effect of perceived stress on decision-making ability ($B = 0.02$, $SE = 0.009$, $t = 2.35$, $p = .01$, $R^2 = .40$). Conditional effects showed that students with higher cognitive flexibility experienced a weaker negative impact of stress on decision-making compared to students with lower flexibility.

Unique Contribution to Theory, Policy, and Practice: The study advances theoretical understanding by confirming cognitive flexibility as a protective factor that buffers stress-related impairments in decision-making. Practically, findings highlight the importance of cognitive flexibility training and stress management interventions in university settings. Policymakers and universities should implement programs to enhance students' adaptive decision-making under stress, promoting academic performance and overall well-being.

Keywords: *Perceived Stress, Cognitive Flexibility, Decision-Making Ability, University Students, Pakistan.*

Introduction

For young adults, university life feels as a period of challenges and changes as they have to deal with higher academic pressure, sustain social relationship among peers, financial pressure, and concern about their future (Adams et al., 2016; Ambe et al., 2024; Shen et al., 2025). These pressures result in high perceived stress, which means situation in their life is difficult, challenging, overwhelming, and unmanageable as the adequate resources are not enough to mitigate it (Al-Garni et al., 2026; Han et al., 2026). Those with higher better decision-making abilities or decisive individuals deal with these stresses effectively, and those with weaker decision-making abilities tend to perceived higher stress (Kuhnell et al., 2020; Sabti, 2025). Decision-making in university life is an important skill because students often need to choose between different academic, personal, and career-related options (Abdullah et al., 2018; Sarwar et al., 2024; Yaghi & Alabed, 2021). However, stress make it difficult for students to think clearly and select best appropriate action (Samancı & Mazlumoğlu, 2023; Smith, 2003). In such crunch situation, cognitive flexibility, i.e., ability to adjust one's thinking and considered different sort of perspectives, may come up as helpful tool to manage stress and make a better decision.

Stress is experienced commonly by university students across the globe. The main factors associate with stress are higher academic workload, competition, financial situations, and meeting higher expectations of the family, particularly parents (Javaid et al., 2024; Rizwan et al., 2020; Singh et al., 2023). When the coping mechanism among students are weaker than the demands, they get emotional pressure and mental exhaustion (Długosz & Liszka, 2021; Klinkenberg et al., 2024; Law, 2007; Shaikh et al., 2004). The higher level of stress detrimentally effect on level of concentration, memory, as well as on the problem-solving abilities (e Zehra & Malik, 2025; Pelz, 2024; Portnova et al., 2026). These cognitive faculties are essential to make useful decisions, particularly when the students are required to assess different options and think about possible outcomes (Calma & Davies, 2026; Fuchs et al., 2023; Hassanbeigi et al., 2011; Mousavi, 2017). As the stress threshold overwhelms, students tend to make impulsive and less thoughtful decision instead of carefully evaluating available choices (Chavan, 2024; Flores-Builds & Mateu-Pérez, 2025; Keinan, 1987; Naseer et al., 2025).

Previous cross-sectional study in India examined 222 adults to explore relationship between General Decision-Making Styles and perceived stress. Results indicated that perceived stress had a detrimental effect on decision-making, with Dependent and Intuitive styles particularly affected. Findings highlight the impact of stress on decision-making processes and potential intervention strategies (Santhosh, 2025). Similarly, online cross-sectional study in India surveyed 152 adults (18–50 years) to examine the relationship between perceived stress and decision-making. Results showed that stress negatively impacted decision-making, highlighting the negative effect of stress on individuals' ability to make effective and adaptive decisions (Ademi et al., 2022).

Cognitive flexibility is an important cognitive resource that assist individual in adapting their thinking when they face difficult or new situations. It encompasses the capacity of shifting perspectives, consider different solutions, and behave according to the changes in demands (Dumbi & Indrasari, 2024; Marzouq, 2024; Nakhostin-Khayyat et al., 2024; Pourjaberi et al., 2023). Empirical evidences have reported that students with higher cognitive flexibility are better in coping with stressful circumstances than those with lower cognitive flexibility, because those with lower cognitive flexibility may not think of alternative strategies and solutions (Cheng et al., 2014; Harel et al., 2023; Kato, 2012; Muyan-Yılık & Demir, 2020). A previous laboratory study in Switzerland with 49 expert decision makers investigated how cognitive flexibility relates to decision making abilities. Results showed that greater cognitive flexibility enhanced decision-making performance, enabling better adaptation between automatic and deliberative processes, underscoring flexibility's positive impact on effective decision outcomes (Laureiro-Martínez & Brusoni, 2018). Another cross-sectional study in Poland surveyed 1,701 university students from medical and social disciplines to examine stress, fatigue, empathy, and cognitive flexibility. Results indicated that cognitive flexibility buffered the detrimental effect of stress on decision-making, highlighting its role in protecting decision-making abilities under high-stress conditions (Rudnik et al., 2025).

This study is grounded in Cognitive Flexibility Theory (Spiro, 1988; Spiro et al., 2019), which states that adaptive thinking and restructuring knowledge enhances critical and effective problem-solving skills in difficult circumstances. Cognitive flexibility helps in coming up with different options to counter the stress and to meet situational demand (Hu & Spiro, 2021; Marzouq, 2024). In the context of university students, cognitive flexibility enables individuals to maintain decision-making performance under high stress by allowing them to evaluate alternatives and adapt their choices effectively (Demirtaş, 2020; Karakuş, 2024; Tüfekçibaşı & Şahin, 2020).

Pakistan is a country where mental health awareness is limited even in the educational sectors. University students particularly face enormous challenges, i.e., higher family expectation, competition, financial problems, academic challenges, etc (Javaid et al., 2024; Yasir et al., 2025). Higher perceived stress is associated with poor decision making in terms of academics, relationship with peers, and other important aspects of life (Din et al., 2026; Hasan et al., 2023). Cognitive flexibility may play a crucial moderating role to mitigate the detrimental effect of perceived stress on decision making ability. However, such studies are very rare in Pakistan; thus, this study objective is to overcome the gap by investigating the moderating role of cognitive flexibility between perceived stress and decision-making ability among university students of Pakistan.

Hypothesis

1.There is a significant moderating role of cognitive flexibility between perceived stress and decision-making ability among university students in Pakistan.

Method

Research Design

The study adopted a cross-sectional correlational design to examine the relationships among the study variables, i.e., perceived stress, cognitive flexibility, and decision-making ability. This design was chosen because it is time-efficient and suitable for the current research context.

Sampling and Inclusion Criteria

The study used a purposive sampling technique to collect data from university students in Pakistan. Participants were required to be at least 18 years old, currently enrolled in a university, and not diagnosed with any mental disorder.

Study Measures

Perceived Stress

The *Perceived Stress Scale (PSS)* is a widely used 10-item self-report measure that assesses the degree to which individuals perceive situations in their lives as stressful. Each item is rated on a 5-point Likert scale ranging from *0 ("never") to 4 ("very often"),* with higher scores indicating greater perceived stress. The PSS has demonstrated excellent reliability, with reported Cronbach's alpha coefficients ranging from .78 to .91 in recent studies.

Decision-Making Ability

Decision-making ability was measured using the *Melbourne Decision Making Questionnaire (MDMQ)* developed by Mann and colleagues. The instrument consists of 22 items designed to assess how individuals cope with decisional conflict. Responses are recorded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale has demonstrated satisfactory reliability and validity across different cultural contexts, with reported Cronbach's alpha coefficients ranging from .70 to .84 (Mann et al., 1997, 1998; Radford et al., 1986).

Cognitive Flexibility

Cognitive flexibility was measured using the *Cognitive Flexibility Inventory* (Dennis & Vander Wal, 2010). The scale consists of 20 items designed to assess an individual's ability to adapt cognitive processing strategies in response to challenging or stressful situations. The instrument has demonstrated strong psychometric properties, with a reported Cronbach's alpha of approximately .90 for the total scale (Dennis & Vander Wal, 2010).

Ethical Consideration

The study adhered to the ethical standards of the Declaration of Helsinki. The authors of the instruments were electronically emailed to obtain permission to use their questionnaires. A consent form was prepared, clearly outlining voluntary participation, confidentiality, the purpose

of the study (briefly), and the right of participants to withdraw at any time. Public and private universities in Karachi, Islamabad, and Lahore were approached from September to November, 2025. Upon signing the consent form, participants were provided with the demographic questionnaire and study questionnaires. Out of 179 participants, 142 completed the questionnaires, yielding a response rate of 79.3%. No physical or emotional harm occurred to the participants. The collected data were subsequently entered into SPSS software for analyses.

Results

Table 1: *Demographic Characteristics of the Participants (N = 142)*

Characteristics	Frequency	Percentage	Mean (Standard Deviation)
Age			23.97 (3.74)
Gender			
Male	82	57.7	
Female	60	42.3	
Educational Level			
Bachelor	64	45.1	
Master	57	40.1	
PhD	21	14.8	
City of Residence			
Karachi	67	47.2	
Islamabad	27	19	
Rawalpindi	26	18.3	
Lahore	22	15.5	
University Type			
Public	100	70.4	
Private	42	29.6	
Socioeconomic Class			
Upper Class	21	14.8	
Middle Class	58	40.8	
Lower Class	63	44.4	
Living Arrangement			
With Family	66	46.5	
Hostel	49	34.5	
Rental Apartment	27	19	

Table 1 presents the demographic characteristics of the 142 participants in the study. The mean age of the sample was 23.97 years (SD = 3.74), indicating that the participants were primarily young adults. A majority were male (n = 82, 57.7%), while females accounted for 42.3% (n = 60). Regarding educational level, 45.1% (n = 64) were undergraduate students, 40.1% (n = 57) were master's students, and 14.8% (n = 21) were PhD students. Most participants were from Karachi (n = 67, 47.2%), followed by Islamabad (n = 27, 19%), Rawalpindi (n = 26, 18.3%), and Lahore (n = 22, 15.5%). In terms of university type, 70.4% (n = 100) attended public universities, and 29.6%

(n = 42) attended private universities. Participants' socioeconomic class was distributed as 14.8% (n = 21) upper class, 40.8% (n = 58) middle class, and 44.4% (n = 63) lower class. With respect to living arrangements, 46.5% (n = 66) lived with family, 34.5% (n = 49) resided in hostels, and 19% (n = 27) lived in rental apartments.

Table 2: *Psychometric Properties of the Scales (N = 142)*

Scales	*M*	*SD*	Range	Cronbach's α
Perceived Stress Scale	15.80	6.37	5 – 28	.80
Cognitive Flexibility Inventory	90.64	16.39	39 - 128	.80
Melbourne Decision Making Questionnaire	87.40	14.48	33 - 108	.91

Note. M = Mean, *SD*= Standard Deviation

Table 2 presents the descriptive statistics and internal consistency of the study measures. The Perceived Stress Scale had a mean score of 15.80 (SD = 6.37) with a score range of 5 to 28, demonstrating good reliability (Cronbach's α = .80). The Cognitive Flexibility Inventory showed a mean of 90.64 (SD = 16.39) with a range of 39 to 128, also indicating acceptable internal consistency (α = .80). The Melbourne Decision Making Questionnaire had a mean of 87.40 (SD = 14.48) and a range of 33 to 108, with excellent reliability (α = .91). Overall, all scales exhibited satisfactory psychometric properties for use in this sample.

Table 3: *Correlational Analysis (N = 142)*

Variables	1	2	3
1.Percieved Stress	-	-.06	-.61**
2.Cognitive Flexibility		-	.09
3.Decision-Making Ability			-

Note. ***p* < .01*

Table 3 presents the Pearson correlations among perceived stress, cognitive flexibility, and decision-making ability. Perceived stress was significantly negatively correlated with decision-making ability (r = −.61, p < .01), indicating that higher levels of perceived stress are associated with poorer decision-making ability. Cognitive flexibility was not significantly correlated with perceived stress (r = −.06) and decision-making ability (r = .09).

Table 4: *Moderation Analysis of Cognitive Flexibility on the Relationship Between Perceived Stress and Decision-Making Ability (N = 142)*

Predictor	B	SE	t	P	95%CI (LL - UL)
Constant	136.87	14.78	9.25	<.001	107.64 – 166.11
Perceived Stress	-3.37	0.85	-3.94	<.001	-5.06 – 1.68
Cognitive Flexibility	0.30	0.15	1.89	.06	-0.62 – 0.01
Perceived Stress X Cognitive Flexibility	0.02	0.009	2.35	.01	0.003 – 0.04

Note. ***p* < *.05,* ****p* <*.001*, R^2 = .40, F = 31.07, B = Unstandardized Coefficient, SE = Standard Error, CI = Confident Interval, LL = Lower Level, UL = Upper Level

Table 4 presents the results of the moderation analysis examining the effect of perceived stress on decision-making ability with cognitive flexibility as a moderator. The constant was significant (B = 136.87, SE = 14.78, t = 9.25, p < .001), indicating the baseline level of decision-making ability when predictors are held constant. The main effect of perceived stress was significant and negative (B = −3.37, SE = 0.85, t = −3.94, p < .001), suggesting that higher perceived stress is associated with lower decision-making ability. The main effect of cognitive flexibility was not statistically significant (B = 0.30, SE = 0.15, t = 1.89, p = .06), indicating that cognitive flexibility alone did not significantly predict decision-making ability. Importantly, the interaction between perceived stress and cognitive flexibility was significant (B = 0.02, SE = 0.009, t = 2.35, p = .01), demonstrating that cognitive flexibility significantly moderates the relationship between perceived stress and decision-making ability. The overall model was significant (R^2 = .40, F = 31.07), indicating that the predictors collectively explained 40% of the variance in decision-making ability.

Table 5: *Conditional Effects of Perceived Stress on Decision-Making Ability at Low, Moderate, and High Levels of Cognitive Flexibility (N = 142)*

Cognitive Flexibility	B	SE	T	P	95% CI (LL - UL)
Low (16th percentile = 74)	-1.73	0.21	-8.21	< .001	-2.15 – -1.32
Moderate (50th percentile = 92)	-1.36	0.15	-9.10	< .001	-1.66 - -1.06
High (84th percentile = 105)	-1.08	0.19	-5.47	< .001	-1.47 - -.69

Note. ***p* <*.001*, B = Unstandardized Coefficient, SE = Standard Error, CI = Confident Interval, LL = Lower Level, UL = Upper Level

Table 5 presents the conditional effects of perceived stress on decision-making ability at low, moderate, and high levels of cognitive flexibility. At low cognitive flexibility (16th percentile = 74), perceived stress had a significant negative effect on decision-making ability (B = −1.73, SE = 0.21, t = −8.21, p < .001), indicating that students with lower cognitive flexibility experience a stronger negative impact of stress on decision-making ability. At moderate cognitive flexibility (50th percentile = 92), the negative effect remained significant (B = −1.36, SE = 0.15, t = −9.10, p < .001). At high cognitive flexibility (84th percentile = 105), perceived stress still showed a

significant negative effect on decision-making ability, though the magnitude of the effect was weaker (B = −1.08, SE = 0.19, t = −5.47, p < .001). These findings indicate that as cognitive flexibility increases, the negative effect of perceived stress on decision-making ability decreases, suggesting that cognitive flexibility acts as a protective factor in the relationship between perceived stress and decision-making ability.

Discussion

The objective of the study was to evaluate the moderating role of cognitive flexibility between perceived stress and decision-making ability among university students in Pakistan, to fill gaps in the literature and provide relevant implications.

The correlation analysis depicted that perceived stress has a negative but not significant relationship with cognitive flexibility, while the relationship between perceived stress and decision-making ability is significant and negative among university students in Pakistan. The results of this study are similar to a cross-sectional study in Pakistan that examined 336 adults and reported a weak positive relationship between perceived stress and cognitive flexibility (Aftab et al., 2025). Another cross-sectional study conducted in Greece on 150 adults aged 18–50 reported that the relationship between emotional intelligence and decision-making ability was positive; however, perceived stress was negatively related to decision-making ability, highlighting the harmful impact of perceived stress (Ademi et al., 2025).

The correlational analysis also reported that cognitive flexibility has a positive but not significant relationship with decision-making ability among university students in Pakistan. A cross-sectional study in Turkey examined 349 university students aged 17–25 and found significant relationships between decision-making self-esteem and cognitive flexibility. Cognitive flexibility significantly predicted decision-making styles, suggesting that higher cognitive flexibility is associated with more adaptive and confident decision-making among university students (Eldeleklioğlu, 2021).

The hypothesis of the study is supported, as cognitive flexibility significantly moderates the relationship between perceived stress and decision-making ability. The Hayes Process Macro Model 4.2, Model 1, reported that cognitive flexibility significantly moderated the negative influence of perceived stress on decision-making ability among university students in Pakistan. An experimental study in the United States examined the effect of stress on cognitive flexibility among adult participants using the Wisconsin Card Sorting Test. Results indicated that higher perceived stress was associated with changes in cognitive flexibility, reflected in increased perseverative errors and reduced performance (Knauft et al., 2021). A conceptual study highlights that cognitive flexibility enables strategic decision makers to overcome inertia in changing environments. By adjusting between habitual (Type 1) and deliberative (Type 2) thinking depending on problem structure, managers with high cognitive flexibility achieve superior decision-making and effectively adapt to dynamic organizational demands (Laureiro-Martínez & Brusoni, 2018). The

results of the study align with Cognitive Flexibility Theory (Spiro, 1988; Spiro et al., 2019), which states that adaptive thinking and restructuring knowledge enhances critical and effective problem-solving skills in challenging circumstances.

Conclusion

The quantitative survey correlational design study conducted on university students filled the gap in the existing literature in the cultural context of Pakistan by assessing the moderating role of cognitive flexibility between the predictor, perceived stress, and decision-making ability as an outcome. Although cognitive flexibility did not demonstrate a direct significant relationship with decision-making, it played a crucial moderating role in buffering the adverse effects of stress on decision-making ability. Thus, the findings support Cognitive Flexibility Theory, shedding light on adaptive thinking as a productive mechanism to reduce stress and make better decisions among university students, where challenges such as academic, financial, and other aspects of life are high.

Limitations, Recommendations, and Implications

The study has several limitations. First, its cross-sectional correlational design involved collecting data at a single point in time; future studies should consider adopting a longitudinal design. Second, the study used English questionnaires. Although English is an official language in Pakistan, not all university students are fully proficient; future studies should include Urdu versions of the questionnaires. Additionally, shorter questionnaires should be preferred in future studies to save time.

Despite these limitations, the study has several practical implications for universities in Pakistan. University counseling departments should take effective steps to educate students about mental health and cognitive flexibility to enhance decision-making. Workshops, seminars, and webinars conducted by mental health professionals can raise awareness and improve students' decision-making abilities. Furthermore, media outlets should play a crucial role by inviting mental health professionals to discuss the detrimental effects of perceived stress, strategies to reduce stress, and methods to enhance cognitive flexibility for better decision-making.

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