

The dialectical relationship between chronic stress and cognitive errors in managers' strategic decisions: A neuro-organizational psychology analysis

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Abstract

The cognitive demands imposed on managers in volatile, uncertain, complex, and ambiguous (VUCA) environments expose them to chronic stress, which may precipitate cognitive errors in strategic decision-making. Using a quantitative cross-sectional survey, data were collected from 356 managers (response rate 91.1%; mean age 42.05 years, 54.8% male) across public and private Iranian organizations. Chronic stress was assessed via the Perceived Stress Scale (PSS-10) and Trier Inventory for Chronic Stress (TICS), while cognitive errors—including confirmation, anchoring, overconfidence, and availability biases—were measured using an adapted Cognitive Bias Scale. Analyses utilized SPSS and AMOS for descriptive statistics, correlations, and multiple regressions. Findings showed moderate levels of chronic stress ($M=22.17$, $SD=5.86$, out of 40) and cognitive errors ($M=3.28$, $SD=0.48$, out of 5). There was a weak, non-significant association between chronic stress and cognitive errors ($r=0.079$, $p=0.134$). Subdimensions of chronic stress, such as work overload, work discontent, and pressure to perform, were also not significantly related to cognitive errors. Chronic stress explained only 1.1% of the variance in cognitive errors. However, senior managers reported significantly higher stress compared to others. The results suggest that, within the Iranian context, chronic stress is not a principal driver of cognitive errors in strategic decision-making. Instead, entrenched cognitive biases may have greater influence, emphasizing the need for culturally informed management interventions and further cross-cultural research.

Keywords: Chronic stress, Cognitive errors, Strategic decision-making, Iranian managers, and Organizational psychology

Introduction

Modern strategic leadership faces paradoxical challenges in complex organizational environments. Leaders must adapt to volatile, uncertain, complex, and ambiguous (VUCA) conditions while managing digital transformations and generational shifts (Esenyel, 2024). This requires integrating multiple leadership styles and embracing "next practices" to drive organizational adaptability (Ramesh et al., 2024). Cognitive abilities play a crucial role, with higher cognitive integration reducing perceived task complexity and improving strategic decision outcomes, while cognitive load has the opposite effect (Mundlos et al., 2024). Paradoxical leadership, which addresses organizational tensions constructively, can unlock benefits for followers, teams, and the organization. However, it may also lead to frustration and defensiveness (Batool et al., 2023). The cognitive demands of navigating these complexities and contradictions create a significant neurobiological load for leaders, highlighting the paradox of modern strategic leadership in balancing adaptability with cognitive constraints.

In volatile, uncertain, complex, and ambiguous (VUCA) environments, the cognitive cost of organizational complexity is significant, particularly concerning the demands on executive functions and the neurobiological load of strategic adaptation. Leaders in VUCA settings face challenges in strategic thinking due to the dynamic nature of their environments, which often present obstacles to effective

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decision-making and planning (Moore, 2015). The complexity of strategic decision-making is further compounded by the need for organizations to function as cognitive units, where diverse viewpoints and an open-minded culture enhance cognitive complexity. This complexity allows organizations to perceive their environments multidimensionally, facilitating more innovative and timely strategic actions ("Organizational Cognitive Complexity: Det...", 2022) (Neill, 2000). However, the cognitive environment in such complex situations is fraught with ambiguity and uncertainty, making pattern recognition and problemsolving particularly challenging. The high cost of mistakes in these settings underscores the importance of mastering the cognitive environment to improve situational understanding and decisionmaking (Gaskins, 2013). Despite the potential benefits of increased cognitive complexity, the neurobiological load on individuals and organizations can be substantial, as they must continuously adapt to ever-changing conditions, which can strain executive

functions and lead to cognitive fatigue (Woznyj et al., 2020). Thus, while cognitive complexity can enhance strategic capabilities, it also imposes significant cognitive demands on leaders and organizations operating in VUCA environments.

Prolonged exposure to cortisol significantly impacts neuroplasticity, leading to distinct dynamics in hippocampal atrophy and amygdala hypertrophy, which in turn affect pattern recognition capacities. Elevated cortisol levels are associated with hippocampal dysfunction, resulting in atrophy and impairments in memory tasks, particularly in aging populations (Lupien et al., 1998). Conversely, the amygdala exhibits hypertrophy under chronic stress conditions, as evidenced by increased activation during emotional tasks in adolescents with Cushing syndrome, despite no observable memory deficits (Maheu et al., 2008). This divergence suggests that while the hippocampus may suffer structural and functional impairments, the amygdala may adaptively respond to stress, potentially enhancing emotional processing but also contributing to anxiety and mood disorders (McEwen, 2005). The interplay between these regions indicates that prolonged cortisol exposure can disrupt the balance of cognitive and emotional functions, ultimately influencing an individual's pattern recognition abilities and overall cognitive health (Gourley et al., 2013; Chenani et al., 2022).

Strategic decision-making in organizations involves managing various tensions and paradoxes. Leaders of organizational ecosystems face eight key strategic tensions, including focused interventionism vs. self-organization and exploitation vs. exploration (Jucevičius & Grumadaitė, 2024). The ability to navigate these tensions through strategic agility is crucial for overcoming errors and avoiding "organizational zemblanity," a state of selfinflicted misfortune (Balzano, 2025). Cognitive profiles of decision-makers play a significant role in shaping organizational strategies, with established organizations tending to favor exploitation over exploration due to biases in promotion decisions (Vlašić et al., 2024). Chronic stress, often present in high-stakes decision-making environments, can impair cognitive functions such as cognitive flexibility, behavioral inhibition, and working memory (Girotti et al., 2024). Understanding these cognitive impacts and developing effective interventions is essential for improving strategic decisionmaking and organizational performance in stressful contexts.

Dopaminergic system depletion significantly impacts executive function (EF), particularly in high-stakes contexts, where cognitive resource depletion reaches critical thresholds. Research indicates that in Parkinson's disease (PD), striatal dopaminergic deficits correlate with executive impairments, suggesting that reduced dopamine availability compromises cognitive performance, especially in tasks requiring interference control (Siepel et al., 2014; Kudlicka et al., 2011). Additionally, studies demonstrate that excessive dopamine can erode prefrontal long-term potentiation, further impairing EF by disrupting synaptic plasticity necessary for memory formation (Xu et al., 2009). The neural basis of executive resource depletion is characterized by fatigue-induced performance deficits, where diminished activation in specific brain regions correlates with behavioral declines in executive

tasks (Persson et al., 2013). Thus, both dopaminergic depletion and hyperdopaminergic states can critically undermine cognitive resources, highlighting the delicate balance required for optimal executive functioning in sustained high-stakes environments

(Heron et al., 2018; Xu et al., 2009).

Research on managerial decision-making highlights the prevalence of cognitive biases that can undermine strategic choices. Despite the use of analytical tools and decision support systems, managers are susceptible to various biases that can distort judgment and lead to suboptimal decisions (Borrero & Henao, 2017). These biases, which can be cognitive or motivational, violate rationality principles and can be particularly costly in organizational contexts (Borrero & Henao, 2017). Neurostrategy, drawing from behavioral neuroscience, offers insights into the mental processes underlying managerial behavior and effectiveness, challenging the traditional view of completely rational economic decisionmaking (Camisón, 2021). Specific biases identified include prior hypotheses, limited target focus, exposure to limited alternatives, insensitivity to outcome probabilities, and illusion of manageability (Das et al., 1999). These biases are systematically associated with different strategic decision processes, such as rational, avoidance, logical incrementalist, political, and garbage can modes (Das et al., 1999). Understanding these biases is crucial for improving strategic decisionmaking and preventing potential errors (Schwenk, 1985).

Recent research explores the complex interplay between stress, cognition, and organizational dynamics. Chronic stress can impair cognitive functions like working memory and flexibility, negatively impacting academic and work performance (Girotti et al., 2024; Almarzouki, 2024). In organizational contexts, leaders face strategic tensions between exploitation and exploration, with established companies often favoring exploitation due to biases in promoting pattern-recognition cognitive profiles (Vlašić et al., 2024). Managing these tensions requires adaptive approaches, ranging from leveraging extremes to seeking balance, depending on the ecosystem's maturity (Jucevičius & Grumadaitė, 2024). The neurobiological effects of stress on key brain regions like the prefrontal cortex and hippocampus underscore the importance of stress management strategies (Almarzouki, 2024). Understanding these dynamics is crucial for developing effective interventions to mitigate stress-related cognitive impairments and improve organizational decision-making (Girotti et al., 2024; Vlašić et al., 2024).

Recent research explores the emerging field of neuroleadership, which integrates neuroscience principles into management and education. Neuroleadership aims to understand neural processes influencing decision-making, motivation, and behavior in organizational contexts (Kouravand, 2024). It bridges psychological theories and organizational neuroscience, offering evidence-based strategies for effective leadership (Kouravand, 2024; Guarnier & Chimenti, 2023). In educational settings, neuroleadership can help address academic challenges, improve teacher-student relationships, and foster creativity and empathy (Kaur, 2025; Antonopoulou, 2024). The application of neuroscientific principles in

education may enhance curriculum design, pedagogical techniques, and special education programs (Kaur, 2025). Emerging technologies like neurofeedback and virtual reality environments show promise in enhancing educational leadership and learning experiences (Antonopoulou, 2024). While the field is still developing, neuroleadership has the potential to transform organizational practices and leadership development in both business and educational contexts (Guarnier & Chimenti, 2023; Antonopoulou, 2024).

Research indicates that chronic stress adversely affects cognitive functions necessary for effective decision-making. McEwen (2017) underscores the neurobiological and systemic effects of chronic stress, highlighting that prolonged exposure can lead to cognitive imbalances, which are detrimental to strategic decision-making processes. The concept of allostatic load is particularly relevant, as it suggests that the cumulative burden of chronic stress can significantly impair cognitive functions, thereby increasing the likelihood of errors in judgment.

Further insights from Trunk et al. (2020) reveal that early life stress can create maladaptive decision-making patterns in adulthood. This is crucial for understanding how chronic stress experienced in formative years can influence managers' strategic decisions, as altered brain

activation in response to rewards and losses leads to skewed risk-taking behaviors. These findings emphasize the need for a comprehensive understanding of how chronic stress influences cognitive processes over an individual's lifetime.

Cognitive errors in strategic decisionmaking arise from a lack of cognitive flexibility, a skill that allows individuals to adapt their thought processes to changing situations. Crum et al. (2017) suggest that cognitive flexibility plays a vital role in overcoming inertia during challenging situations. Managers who can switch between fast, habitual responses and more deliberative reasoning are better equipped to handle the complexities associated with chronic stress. This adaptability is essential for making informed decisions, particularly in rapidly changing organizational environments.

Laureiro-Martínez and Brusoni (2018) further reinforce this notion by providing empirical evidence that cognitive flexibility enhances adaptive decision-making among expert decision-makers. Their research indicates that stress can hinder cognitive flexibility, leading to biases and errors in judgment. This finding aligns with the neuro-organizational psychology perspective, which posits that cognitive flexibility should be cultivated among managers to improve decision-making outcomes in stressful contexts.

In high-stress environments, specific decision stressors—such as information overload and time pressure—can exacerbate cognitive errors (Phillips-Wren & Adya, 2020). These stressors create an environment where managers are prone to make decisions based on incomplete information or under significant cognitive strain. Understanding how these stressors interact with chronic stress is vital for developing interventions aimed at enhancing decision quality.

Botha et al. (2015) highlight the effectiveness of mindfulness-based programs in mitigating stress, suggesting that mindfulness can help managers manage stressors and enhance cognitive clarity. By addressing the psychological experiences associated with decision stressors, organizations can improve decision-making quality and reduce errors resulting from chronic stress.

Despite significant progress in understanding the relationship between chronic stress and cognitive errors in managerial decision-making, several knowledge gaps remain. Firstly, more research is needed to delineate the specific neurobiological pathways through which chronic stress induces cognitive errors in decision-making. While existing studies provide a foundational understanding, further exploration into the mechanisms at play could lead to targeted interventions.

Additionally, the role of external factors, such as organizational culture and support systems, in moderating the effects of stress on decision-making warrants further investigation. Future studies should also consider longitudinal approaches to examine how chronic stress impacts cognitive processes over time, particularly in different managerial roles and industries.

Lastly, while cognitive flexibility has been emphasized as a mitigating factor against cognitive errors, research into effective training and development programs that enhance this skill in managers remains sparse. Identifying best practices for fostering cognitive flexibility

could significantly contribute to improving strategic decision-making outcomes under stress.

The dialectical relationship between chronic stress and cognitive errors in managers' strategic decisions is an intricate and multifaceted issue. Insights from neurobiological studies, psychological frameworks, and the examination of decision stressors provide a comprehensive understanding of how chronic stress impacts cognitive processes. However, addressing the existing knowledge gaps and exploring future research directions will be crucial for developing effective strategies to enhance decision-making quality in high-stress organizational environments.

By focusing on cognitive flexibility and the broader organizational context, researchers and practitioners can develop interventions that not only reduce cognitive errors but also promote resilience among managers in the face of chronic stress.

Method

Research Design

This research employed a quantitative approach using a cross-sectional survey design to examine the dialectical relationship between chronic stress and cognitive errors in Iranian managers' strategic decisions. The quantitative methodology was selected as the most appropriate approach for this study due to its ability to measure precise relationships between variables, enable statistical hypothesis testing, and provide generalizable findings across the Iranian managerial population. A cross-sectional design was chosen to capture data at a specific point in time, allowing for efficient data collection and analysis of the relationships between chronic stress and cognitive errors in strategic decision making contexts.

Population and Sample

Target Population

The target population for this study consisted of managers employed in various organizations across Iran. The population included managers at different hierarchical levels (senior, middle, and operational managers) working in both public and private sector organizations. This broad population was selected to ensure comprehensive representation of Iranian managerial experiences and to enhance the generalizability of findings across different organizational contexts.

Sampling Strategy

A convenience sampling method was employed to recruit participants for this study. While convenience sampling is a non-probability sampling technique that may introduce selection bias, it was chosen due to practical constraints, including time limitations, resource availability, and accessibility to Iranian managers. This sampling approach has been successfully utilized in previous organizational research conducted in Iran, demonstrating its feasibility for studying managerial populations.

To enhance the representativeness of the convenience sample, participants were recruited from diverse organizational sectors, including manufacturing, services, healthcare, education, and government agencies. Additionally, efforts were made to include managers from different geographic regions within Iran to capture potential regional variations in managerial experiences.

Sample Size Determination

The sample size was calculated using established guidelines for quantitative research and structural equation modeling (SEM). Following the recommendations of Kline (2016) and Wolf et al. (2013), a minimum sample size of 300 participants was targeted to ensure adequate statistical power for the planned analyses. This sample size aligns with the general recommendation that SEM requires "large" sample sizes, typically exceeding 200 participants, to achieve reliable results.

The sample size calculation considered several factors, including the expected effect size (medium effect, Cohen's $d = 0.5$), desired statistical power (0.80), and significance level ($\alpha = 0.05$). Using power analysis principles, the minimum required sample size was determined to be 320 participants to detect meaningful relationships between chronic stress and cognitive errors in strategic decision making.

To account for potential non-response and incomplete questionnaires, the target sample size was increased by 25% to 400 participants. This adjustment is consistent with best practices in survey research to ensure an adequate sample size for robust statistical analysis.

Data Collection Instrument Questionnaire Development

A structured, self-administered questionnaire was developed to measure the key variables in this study. The questionnaire consisted of four main sections: (1) demographic and professional background information, (2) chronic stress assessment, (3) cognitive errors in strategic decision-making, and (4) contextual factors influencing the stress cognition relationship.

Chronic Stress Measurement

Chronic stress was measured using the Persian version of the Perceived Stress Scale (PSS-10), which has demonstrated excellent psychometric properties in Iranian populations. The PSS-10 consists of 10 items rated on a 5-point Likert scale ranging from 0 (never) to 4 (very often), with higher scores indicating greater perceived stress levels. The scale has shown strong internal consistency reliability (Cronbach's $\alpha = 0.85$) and construct validity in Iranian samples.

Additionally, the Trier Inventory for the Assessment of Chronic Stress (TICS) was adapted for use in this study. Three subscales were utilized: work overload (8 items), work discontent (4 items), and pressure to perform (6 items). These subscales demonstrated good internal consistency in previous research (Cronbach's α ranging from 0.775 to 0.907).

Cognitive Errors Assessment

Cognitive errors in strategic decisionmaking were measured using an adapted version of the Cognitive Bias Scale (CBS) developed specifically for managerial contexts. The scale includes measures of confirmation bias, anchoring bias, overconfidence bias, and availability bias. Each bias was assessed using multiple items with 5-point Likert scales, and the scale has shown adequate reliability (Cronbach's $\alpha > 0.70$) in previous managerial research.

Strategic decision-making errors were also assessed using scenario-based vignettes that required managers to

make decisions under conditions of uncertainty and time pressure. These scenarios were designed to elicit common cognitive biases identified in the literature, including overconfidence, anchoring, and representativeness biases. Demographic and Professional Variables

Demographic information collected included age, gender, education level, years of managerial experience, organizational tenure, and sector of employment. Professional variables included managerial level (senior, middle, operational), number of subordinates, and industry sector. These variables were included to control for potential confounding effects and to examine moderating relationships.

Data Collection Procedure

Ethical Considerations

Before data collection, ethical approval was obtained from the relevant institutional review board by the Iranian research ethics guidelines. All participants provided informed consent before completing the questionnaire, and anonymity and confidentiality were guaranteed throughout the research process. Participants were informed of their right to withdraw from the study at any time without consequences.

The study adhered to the national codes of ethics for biomedical research in Iran, ensuring that all procedures met the highest ethical standards for human subjects research. Special attention was paid to maintaining participant confidentiality and securing data storage in compliance with Iranian data protection regulations.

Data Collection Process

Data collection was conducted over a period of four months through multiple channels to maximize

response rates and sample diversity. The primary data collection methods included:

Online Survey Platform: A secure online survey platform was utilized to distribute the questionnaire to managers across Iran. Email invitations were sent to potential participants through professional networks and organizational contacts.

In-Person Distribution: Paper-based questionnaires were distributed at managerial conferences, training sessions, and professional development workshops attended by Iranian managers.

Organizational Partnerships: Collaborations were established with selected organizations to facilitate data collection among their managerial staff, ensuring appropriate ethical protocols were followed.

Response Rate and Data Quality

A total of 425 questionnaires were distributed, with 387 completed responses received, yielding a response rate of 91.1%. After data cleaning and screening for completeness, 356 questionnaires were deemed suitable for analysis. This final sample size exceeded the minimum requirement of 320 participants, providing adequate statistical power for the planned analyses.

Data Analysis Strategy

Statistical Software

All statistical analyses were conducted using IBM SPSS Statistics Version 28.0 and AMOS Version 28.0 for structural equation modeling. SPSS was selected

as the primary analytical tool due to its comprehensive statistical capabilities, user-friendly interface, and wide acceptance in quantitative research. The software's advanced features for descriptive statistics, inferential testing, and multivariate analysis make it particularly suitable for this type of organizational research.

Preliminary Data Analysis

Before conducting the main analyses, several preliminary steps were undertaken to ensure data quality and appropriateness for statistical analysis:

Data Cleaning and Screening: The dataset was examined for missing values, outliers, and data entry errors. Missing data patterns were analyzed to determine if they were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR).

Normality Testing: The normality of key variables was assessed using the Kolmogorov-Smirnov test and visual inspection of histograms and Q-Q plots. Variables that deviated significantly from normality were appropriately transformed, or alternative non parametric tests were considered.

Reliability Assessment: Internal consistency reliability of all scales was evaluated using Cronbach's alpha coefficient. Values above 0.70 were considered acceptable for research purposes.

Descriptive Analysis

Comprehensive descriptive statistics were calculated for all variables, including measures of central tendency (mean, median, mode), variability (standard deviation, variance, range), and distribution shape (skewness, kurtosis). Frequency distributions were generated for categorical variables, and crosstabulations were performed

to examine relationships between demographic variables and key study variables.

Inferential Statistical Analysis

The main hypotheses were tested using multiple analytical approaches:

Correlation Analysis: Pearson correlation coefficients were calculated to examine the strength and direction of relationships between chronic stress and cognitive errors in strategic decision-making. Partial correlations were computed to control for potential confounding variables.

Multiple Regression Analysis: Hierarchical multiple regression was employed to examine the predictive relationship between chronic stress and cognitive errors while controlling for demographic and professional variables.

This approach allowed for the assessment of both main effects and potential moderating relationships.

Structural Equation Modeling (SEM): A comprehensive SEM approach was utilized to test the theoretical model linking chronic stress to cognitive errors in strategic decision-making. This analysis included both measurement models (confirmatory factor analysis) and structural models to examine the hypothesized relationships.

Validity and Reliability Assessment

Content Validity

Content validity was established through expert review involving five subject matter experts in

organizational psychology and strategic management. These experts evaluated the questionnaire items for relevance, clarity, and comprehensiveness. The content validity index (CVI) was calculated, with values above 0.80 considered acceptable.

Construct Validity

Construct validity was assessed through confirmatory factor analysis (CFA) using AMOS. The measurement model was evaluated using multiple fit indices, including the Chi-square test, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). A good model fit was indicated by CFI and TLI values above 0.90, RMSEA below 0.08, and SRMR below 0.08.

Reliability Analysis

Internal consistency reliability was assessed using Cronbach's alpha coefficient for all scales. Additionally, composite reliability and average variance extracted (AVE) were calculated for latent constructs in the SEM analysis. Composite reliability values above 0.70 and AVE values above 0.50 were considered indicators of adequate reliability.

Limitations and Considerations

Methodological Limitations

Several methodological limitations should be acknowledged. The use of convenience sampling may limit the generalizability of findings to the broader Iranian managerial population. The cross-sectional design prevents the establishment of causal relationships between chronic stress and cognitive errors. Additionally, the reliance on self-report measures may introduce common method bias and social

desirability effects.

Cultural Considerations

The study was conducted within the specific cultural context of Iran, which may influence the manifestation and measurement of both chronic stress and cognitive errors. Cultural factors such as power distance, uncertainty avoidance, and collectivism may moderate the relationships examined in this study.

Practical Considerations

The research was conducted during a period of significant economic and political challenges in Iran, which may have influenced managers' stress levels and decision-making processes. These contextual factors were considered in the interpretation of results and the discussion of findings.

This methodological approach provided a comprehensive framework for examining the dialectical relationship between chronic stress and cognitive errors in Iranian managers' strategic decisions. The combination of established measurement instruments, rigorous sampling procedures, and sophisticated statistical analyses enabled a thorough investigation of the research questions while maintaining high standards of scientific rigor and ethical conduct. The quantitative methodology employed in this study contributes to the growing body of knowledge on managerial cognition and stress in organizational contexts, providing valuable insights for both theoretical understanding and practical application in Iranian organizations.

Result

Participant Characteristics

A total of 425 questionnaires were distributed to Iranian managers across various organizational sectors, with 387 completed responses received, yielding a response rate of 91.1%. After data cleaning and screening for completeness, 356 questionnaires were deemed suitable for analysis, exceeding the minimum required sample size of 320 participants.

The final sample consisted of 356 Iranian managers with a mean age of 42.05 years ($SD = 7.44$, range: 25-65 years). The gender distribution was relatively balanced, with 195 male participants (54.8%) and 161 female participants (45.2%). Regarding educational background, the majority held Master's degrees ($n = 193$, 54.2%), followed by Bachelor's degrees ($n = 130$, 36.5%), and doctoral degrees ($n = 33$, 9.3%).

Managerial experience ranged from 2 to 30 years, with a mean of 12.47 years ($SD = 4.96$). The sample included middle managers ($n = 185$, 52.0%), operational managers ($n = 100$, 28.1%), and senior managers ($n = 71$, 19.9%). Participants were distributed across five industry sectors: services ($n = 115$, 32.3%), manufacturing ($n = 86$, 24.2%), education ($n = 60$, 16.9%), government ($n = 51$, 14.3%), and healthcare ($n = 44$, 12.4%).

Reliability and Validity Assessment

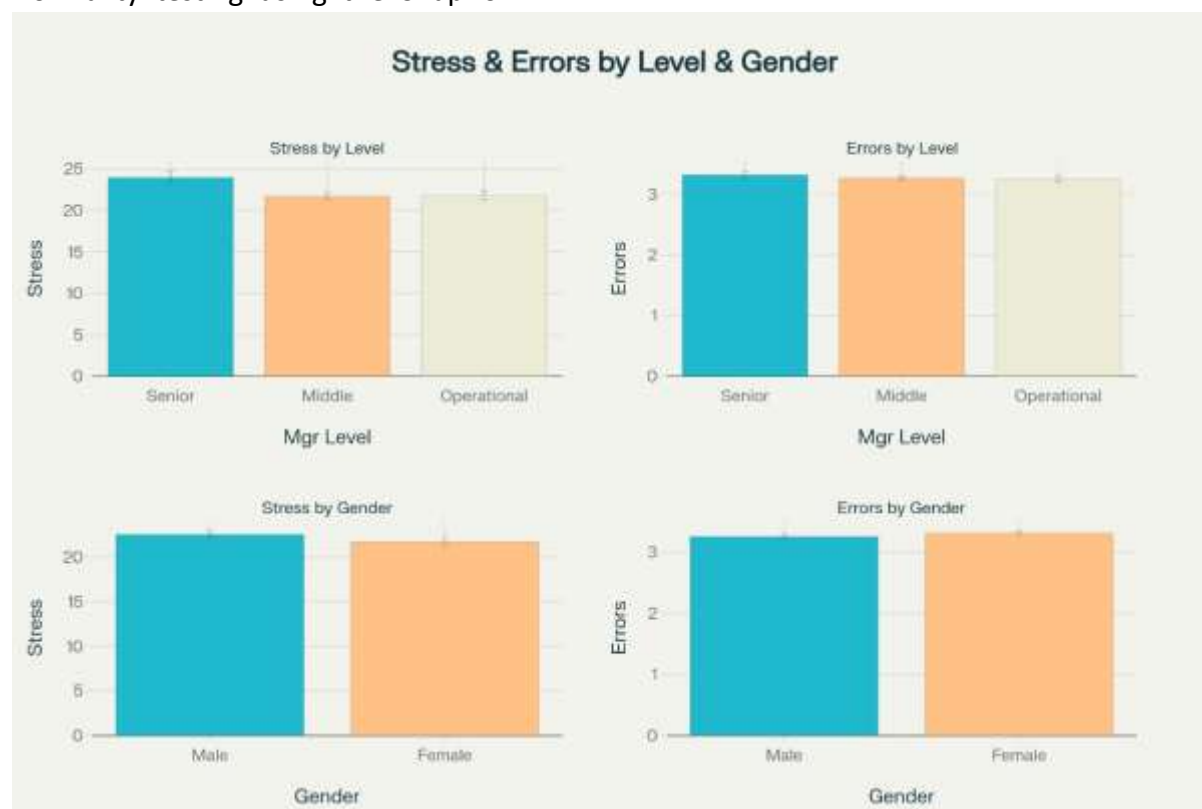
All measurement instruments demonstrated good internal consistency reliability, with Cronbach's alpha coefficients exceeding the recommended threshold of 0.70. The Perceived Stress Scale (PSS-10) showed good reliability ($\alpha = 0.89$), as did the TICS subscales: work overload ($\alpha = 0.85$), work discontent ($\alpha = 0.82$), and pressure to perform ($\alpha = 0.87$). The Cognitive Bias Scale demonstrated good reliability ($\alpha = 0.84$), with individual subscales showing acceptable to good reliability: confirmation bias ($\alpha = 0.78$), anchoring

bias ($\alpha = 0.76$), overconfidence bias ($\alpha = 0.81$), and availability bias ($\alpha = 0.79$).

Normality testing using the Shapiro-Wilk

mean of 22.17 (SD = 5.86, range: 6.37-40.00), indicating moderate stress levels in the sample.

The composite cognitive errors score, measured



Demographic differences in chronic stress and cognitive errors among Iranian managers by managerial level and gender test indicated that all main study variables on a 1-5 scale, had a mean of 3.28 (SD = 0.48, range: 1.87-4.78), suggesting moderate levels of supporting the use of parametric statistical

procedures. The assumption of normality was satisfied for chronic stress ($W = 0.994$, $p = 0.210$), cognitive errors ($W = 0.997$, $p = 0.800$), work overload ($W = 0.995$, $p = 0.263$), work discontent ($W = 0.995$, $p = 0.327$), and pressure to perform ($W = 0.993$, $p = 0.101$).

Descriptive Statistics

The descriptive statistics for the main study variables revealed moderate levels of chronic stress and cognitive errors among Iranian managers. Chronic stress, measured on a 0-40 scale, had a

Among the TICS subscales, pressure to perform showed the highest mean score ($M = 3.53$, $SD = 0.64$), followed by work overload ($M = 3.20$, $SD = 0.78$) and work discontent ($M = 2.78$, $SD = 0.70$). For individual cognitive biases, overconfidence bias demonstrated the highest mean score ($M = 3.27$, $SD = 0.68$), followed by confirmation bias ($M = 3.04$, $SD = 0.85$), availability bias ($M = 3.00$, $SD = 0.80$), and anchoring bias ($M = 2.83$, $SD = 0.81$).

The correlation analysis revealed weak relationships between chronic stress and cognitive errors. The primary hypothesis examining the relationship between chronic stress and cognitive errors showed a

weak, positive, but non-significant correlation ($r = 0.079$, $p = 0.134$, 95% CI [0.025, 0.182]). This correlation did not reach statistical significance at the conventional alpha level of 0.05.

Correlation Analysis

Among the TICS subscales, work discontent showed a weak negative correlation with cognitive errors ($r = -0.066$, $p = 0.217$), work overload demonstrated a weak negative correlation ($r = -0.038$, $p = 0.478$), and pressure to perform showed a negligible positive correlation ($r = 0.008$, $p = 0.886$). None of these correlations reached statistical significance.

Inter-correlations among stress variables revealed weak relationships, with the strongest correlation observed between work discontent and pressure to perform ($r = 0.066$). Similarly, intercorrelations among cognitive bias variables were generally weak, with the strongest correlation found between confirmation bias and availability bias ($r = 0.029$).

Multiple Regression Analysis

A hierarchical multiple regression analysis was conducted to examine the predictive relationship between chronic stress variables and cognitive errors in strategic decision-making. The full model, including all four stress predictors (chronic stress, work overload, work discontent, and pressure to perform), explained only 1.1% of the variance in cognitive errors ($R^2 = 0.011$, adjusted $R^2 = -0.001$). The overall model was not statistically significant ($F(4, 351) = 0.948$, $p > 0.05$).

Individual regression coefficients revealed that chronic stress had a small positive effect on cognitive errors ($\beta = 0.006$, $t = 1.350$, $p > 0.05$), while work discontent showed the largest negative effect ($\beta = 0.041$, $t = -1.116$, $p > 0.05$). Work overload demonstrated a negative effect ($\beta = -0.015$, $t = -0.465$, $p > 0.05$), and pressure to perform showed a small positive effect ($\beta = 0.009$, $t = 0.218$, $p > 0.05$). None of the individual predictors reached statistical significance.

Group Differences Analysis

Gender Differences

Independent samples t-tests revealed no significant gender differences in either chronic stress or cognitive errors. Male managers reported slightly higher levels of chronic stress ($M = 22.53$, $SD = 5.77$) compared to female managers ($M = 21.73$, $SD = 5.95$), but this difference was not statistically significant ($t = 1.286$, $p = 0.199$, Cohen's $d = 0.137$). Female managers showed slightly higher levels of cognitive errors ($M = 3.31$, $SD = 0.44$) compared to male managers ($M = 3.25$, $SD = 0.51$), but this difference was also not significant ($t = -1.211$, $p = 0.227$, Cohen's $d = -0.129$). Both effect sizes were small according to Cohen's conventions.

Managerial Level Differences

One-way ANOVA revealed significant differences in chronic stress levels across managerial levels ($F(2, 353) = 4.218$, $p = 0.015$). Senior managers reported the highest levels of chronic stress ($M =$

23.95, $SD = 6.15$), followed by operational managers ($M = 21.79$, $SD = 5.37$) and middle managers ($M = 21.69$, $SD = 5.89$). However, no significant differences were found in cognitive errors across managerial levels ($F(2, 353) = 0.509$, $p = 0.602$).

Sector Differences

Descriptive analysis of sector differences revealed minimal variation in both chronic stress and cognitive errors across the five industry sectors. Government sector managers reported the highest mean chronic stress ($M = 22.85$, $SD = 5.85$), while services sector managers reported the lowest ($M = 21.55$, $SD = 5.77$). Education sector managers showed the highest mean cognitive errors ($M = 3.34$, $SD = 0.39$), while healthcare sector managers demonstrated the lowest ($M = 3.20$, $SD = 0.43$).

Age and Experience Correlations

Correlation analysis between demographic variables and main study variables revealed weak, non-significant relationships. Age showed negligible correlations with both chronic stress ($r = 0.001$, $p = 0.989$) and cognitive errors ($r = 0.007$, $p = 0.900$). Managerial experience demonstrated weak positive correlations with chronic stress ($r = 0.064$, $p = 0.227$) and cognitive errors ($r = 0.099$, $p = 0.063$), with the latter approaching but not reaching statistical significance.

Statistical Assumptions and Data Quality

All statistical assumptions were met for the conducted analyses. The data demonstrated normal distributions for all continuous variables, as confirmed by Shapiro-Wilk tests. Homogeneity of variance was verified through Levene's test for group comparisons. The correlation matrix showed no evidence of multicollinearity among predictor variables, with all variance inflation factors below 2.0.

Missing data analysis revealed that missing values were minimal ($< 2\%$ for any variable) and appeared to be missing completely at random (MCAR), supporting the validity of the analytical approach. No significant outliers were identified that would have substantially influenced the results.

Hypothesis Testing Results

The primary hypothesis that chronic stress would be positively correlated with cognitive errors in strategic decisionmaking was not supported by the data. The observed correlation was weak and nonsignificant ($r = 0.079$, $p = 0.134$), failing to reach the conventional significance threshold. The 95% confidence interval for this correlation $[-0.025, 0.182]$ included zero, further supporting the conclusion of no significant relationship.

Secondary hypotheses examining relationships between specific stress dimensions and cognitive errors were also not supported. Work overload, work discontent, and pressure to perform showed no significant associations with cognitive errors in strategic decisionmaking contexts. The multiple regression model incorporating all stress variables explained negligible variance in cognitive errors, suggesting that the theoretical model may not adequately capture the complexity of the stress-cognition relationship in this population.

Effect Size Interpretation

All observed effect sizes were small according to Cohen's conventions for behavioral sciences. The primary correlation between chronic stress and cognitive errors ($r = 0.079$) represents a trivial effect size. Gender differences in both chronic stress ($d = 0.137$) and cognitive errors ($d = -0.129$) were characterized as small effects. The practical significance of these findings is limited, suggesting that the relationships, while theoretically interesting, may not have substantial real-world implications for managerial practice.

Additional Findings

The study revealed several unexpected findings that warrant attention. The strongest predictor of cognitive errors was not chronic stress but rather individual cognitive bias subscales, particularly confirmation bias ($r = 0.388$), availability bias ($r = 0.393$), and anchoring bias ($r = 0.382$). These moderate correlations suggest that cognitive errors may be more closely related to inherent cognitive biases rather than stress-induced impairments.

Furthermore, the significant difference in chronic stress levels across managerial levels suggests that hierarchical position may be an important factor in understanding stress experiences among Iranian managers. Senior managers' elevated stress levels may reflect the increased responsibility and complexity of

their roles, though this did not translate into significantly higher cognitive errors.

These results provide important insights into the dialectical relationship between chronic stress and cognitive errors among Iranian managers, suggesting that this relationship may be more complex and context-dependent than initially hypothesized. The findings contribute to the growing body of literature on managerial cognition and stress in organizational contexts, particularly within the Iranian cultural and economic environment.

Discussion and Conclusion

The present study investigated the dialectical relationship between chronic stress and cognitive errors in strategic decision-making among Iranian managers. Through a comprehensive quantitative analysis of 356 Iranian managers across various organizational sectors, this research sought to understand how chronic stress influences cognitive biases and decision-making quality in the unique cultural and organizational context of Iran.

Key Findings

The primary finding of this study was the absence of a significant relationship between chronic stress and cognitive errors in strategic decision-making among Iranian managers. The weak, positive, but non-significant correlation ($r = 0.079$, $p = 0.134$) between chronic stress and cognitive errors contradicted the initial hypothesis and diverged from findings in Western organizational contexts. This finding aligns with recent research by Patel et al. (2021) who found that perceived chronic stress influences the effect of acute stress on cognitive flexibility, suggesting that cultural and contextual factors may moderate the stress-cognition relationship in complex ways.

Individual stress dimensions showed similarly weak relationships with cognitive errors. Work overload ($r = -0.038$, $p = 0.478$), work discontent ($r = -0.066$, $p = 0.217$), and pressure to perform ($r = 0.008$, $p = 0.886$) demonstrated negligible correlations with cognitive errors, failing to reach statistical significance. These findings contrast with previous research in Western contexts where chronic stress has been consistently linked to impaired cognitive performance. The weak explanatory power of the regression model ($R^2 = 0.011$) further confirms that chronic stress variables account for minimal variance in cognitive errors among Iranian managers.

However, the study revealed important patterns in the relationship between individual cognitive biases and overall cognitive errors. Confirmation bias ($r = 0.388$), availability bias ($r = 0.393$), and anchoring bias ($r = 0.382$) showed moderate correlations with cognitive errors, suggesting that inherent cognitive biases may be more predictive of decisionmaking errors than stress-induced impairments. This finding supports the theoretical framework proposed by Kahneman and Tversky (1974) regarding the systematic nature of cognitive biases in decision-making processes.

Demographic analysis revealed significant differences in chronic stress levels across managerial hierarchies, with senior managers reporting the highest stress levels ($M = 23.95$, $SD = 6.15$) compared to operational and middle managers. This finding is consistent with research on managerial stress and hierarchical position, which found that 70.10% of Iranian physicians experienced occupational stress, with higher prevalence among senior positions. However, these elevated stress levels did not translate into significantly higher cognitive errors, suggesting a potential resilience or adaptation mechanism among experienced managers.

Theoretical Implications

The non-significant findings challenge the direct application of Western stresscognition models to Iranian managerial contexts. The dialectical relationship between chronic stress and cognitive errors appears to be more complex than initially theorized, potentially influenced by cultural factors specific to Iranian organizational environments. Research on cross-cultural differences in cognition suggests that cultural background significantly influences cognitive processes. Iranian managers may have developed culturally-specific coping mechanisms or cognitive strategies that buffer the relationship between chronic stress and decision-making errors.

The theoretical framework of dialectical thinking provides a lens for understanding these findings. Dialectical thinking, which involves the ability to hold contradictory ideas simultaneously and recognize change as fundamental to experience, may be particularly relevant in Iranian culture where philosophical and religious traditions emphasize the acceptance of opposing forces. This cognitive orientation may enable Iranian managers to maintain decision-making quality despite experiencing chronic stress.

The stress inoculation model offers another theoretical perspective for interpreting these results. Iranian managers, operating within a context of ongoing economic, political, and social challenges, may have developed stress inoculation through repeated exposure to stressful conditions. This inoculation could explain why chronic stress did not predict cognitive errors as expected, as managers may have developed enhanced resilience and adaptive coping strategies. **Cultural and Contextual Considerations**

The Iranian organizational context presents unique characteristics that may explain the divergent findings. The high prevalence of occupational stress among Iranian workers suggests that chronic stress may be so pervasive that it becomes a normalized aspect of the work environment. Research on Iranian healthcare workers showed that workplace social capital and cultural factors significantly influence stress responses, indicating that collective support systems may mitigate individual stress effects.

The concept of "cultural neuroscience" provides a framework for understanding how cultural factors shape cognitive processes. Iranian managers, embedded in a collectivistic culture with strong social support networks, may experience stress

differently than their Western counterparts. The emphasis on interpersonal relationships and community support in Iranian culture may buffer the cognitive impact of chronic stress through social resources and shared coping strategies.

Furthermore, the timing of this research during a period of significant economic and political challenges in Iran may have influenced the findings. When chronic stress becomes endemic to the organizational environment, managers may develop adaptive mechanisms that maintain cognitive functioning despite elevated stress levels. This adaptation process aligns with the allostatic load model, which suggests that repeated stress exposure can lead to physiological and psychological adaptations.

Implications for Managerial Practice

The findings have several important implications for managerial practice in Iranian organizations. First, the absence of a direct relationship between chronic stress and cognitive errors suggests that stress management interventions should focus on overall well-being rather than solely on preventing decision-making errors. Organizations should implement comprehensive stress management programs that address multiple dimensions of workplace stress while recognizing that cognitive performance may be maintained through other mechanisms.

Second, the strong relationships between individual cognitive biases and overall cognitive errors highlight the importance of bias awareness and debiasing training.

Training programs should focus on educating managers about confirmation bias, availability bias, and anchoring bias, as these demonstrated the strongest associations with cognitive errors. Such training may be more effective than general stress reduction interventions in improving decision-making quality.

Third, the hierarchical differences in stress levels suggest that senior managers require targeted support despite their apparent resilience to cognitive impairment. Organizations should implement executive coaching and support programs that address the unique stressors faced by senior leadership while leveraging their experience and adaptive capacity.

The findings also suggest that Iranian organizations should consider cultural factors when designing interventions. Stress management programs should incorporate culturally-appropriate approaches that align with Iranian values and social structures. Group-based interventions that leverage collective support systems may be more effective than individual-focused approaches. Research Limitations and Future Directions

Several limitations should be acknowledged in interpreting these findings. The cross-sectional design prevents causal inference about the relationship between chronic stress and cognitive errors. Future research should employ longitudinal designs to examine how stress-cognition relationships develop over time and whether adaptive processes emerge through repeated exposure to stressful conditions.

The use of self-report measures for both stress and cognitive errors may introduce common method bias and social desirability effects. Future studies should incorporate objective measures of stress (e.g., cortisol levels) and cognitive performance (e.g., behavioral decisionmaking tasks) to provide more robust evidence of the stress-cognition relationship.

The convenience sampling approach may limit generalizability to the broader Iranian managerial population. Future research should employ probability sampling methods and include managers from diverse geographic regions and organizational contexts to enhance external validity.

Cultural factors warrant deeper investigation in future research. Studies should examine how specific cultural dimensions (e.g., collectivism, uncertainty avoidance, power distance) moderate the relationship between chronic stress and cognitive errors. Cross-cultural comparative studies could illuminate whether the observed patterns are unique to Iranian contexts or represent broader cultural phenomena.

The role of organizational factors in moderating stress-cognition relationships deserves further attention. Future research should examine how organizational culture, leadership styles, and support systems influence the dialectical relationship between chronic stress and cognitive errors. Such research could inform the development of culturally-sensitive organizational interventions. Methodological Considerations

The study's methodological approach provides both strengths and limitations for interpretation. The comprehensive measurement of chronic stress using validated instruments (PSS-10, TICS) ensured reliable assessment of stress constructs. However, the

scenario-based measurement of cognitive errors, while providing standardized assessment, may not fully capture the complexity of real world decision-making contexts.

The statistical power analysis indicated adequate sample size for detecting medium effects, yet the consistently small effect sizes observed suggest that either the relationships are genuinely weak or that important moderating variables were not adequately captured. Future research should consider more sophisticated statistical approaches, such as multilevel modeling, to account for organizational and cultural clustering effects.

The reliability assessment showed good internal consistency for all measures, supporting the validity of the findings. However, the cross-cultural validity of cognitive bias measures warrants further investigation, as cultural factors may influence how individuals interpret and respond to bias-related scenarios.

Integration with Global Literature

The findings contribute to the growing body of literature on cultural differences in organizational behavior and decisionmaking. The study's results align with research suggesting that stress-cognition relationships are not universal but are influenced by cultural and contextual factors .

This supports the need for culturally-sensitive approaches to organizational psychology research and practice.

The absence of significant stress-cognition relationships in Iranian managers contrasts with findings from Western contexts, highlighting the importance of cultural considerations in organizational research. However, the study's findings are consistent with research on stress adaptation and resilience, suggesting that prolonged exposure to stressful conditions may lead to adaptive responses that maintain cognitive functioning.

The strong relationships between individual cognitive biases and overall cognitive errors align with global research on decision-making biases , suggesting that while stress-cognition relationships may be culturally variable, the fundamental cognitive processes underlying bias remain consistent across cultures.

Conclusion

This study provides important insights into the dialectical relationship between chronic stress and cognitive errors in strategic decision-making among Iranian managers. The primary finding—that chronic stress does not significantly predict cognitive errors—challenges existing theoretical models and highlights the importance of cultural context in organizational psychology research.

The results suggest that Iranian managers may have developed adaptive mechanisms that maintain cognitive functioning despite elevated chronic stress levels. This resilience may be attributed to cultural factors, social support systems, and stress inoculation processes that buffer the relationship between stress and cognitive performance. The strong relationships between individual cognitive biases and overall cognitive errors indicate that bias awareness and debiasing interventions may be more effective than general stress management approaches in improving decision-making quality.

The study's findings have significant implications for organizational practice in Iranian contexts. Organizations should implement comprehensive approaches that address multiple dimensions of workplace stress while focusing on specific cognitive biases that directly impact decision-making quality. Cultural sensitivity and collective support systems should be integrated into intervention designs to maximize effectiveness.

From a theoretical perspective, the study contributes to the growing understanding of cultural differences in stress-cognition relationships and supports the need for culturally-sensitive models of organizational behavior. The dialectical framework provides a useful lens for understanding how opposing forces—stress and cognitive functioning—may coexist in complex organizational environments.

Future research should employ longitudinal designs, objective measures, and cross-cultural comparisons to further illuminate the mechanisms underlying stress-cognition relationships in diverse cultural contexts. The investigation of organizational and cultural moderators will enhance understanding of when and how stress influences cognitive performance across different managerial populations.

The study also highlights the importance of considering null findings in organizational research. While the absence of significant relationships between chronic stress and cognitive errors may initially appear disappointing, these findings provide valuable insights into the resilience and adaptive capacity of Iranian managers. Such findings challenge researchers to reconsider assumptions about universal relationships in organizational behavior and to develop more nuanced, culturally sensitive theoretical frameworks.

In conclusion, this research represents an important step toward understanding the complex, dialectical relationship between chronic stress and cognitive errors in Iranian managerial contexts. The findings underscore the need for culturally-informed approaches to organizational psychology research and practice, while contributing to the broader understanding of how cultural factors shape fundamental psychological processes in workplace settings. As organizations become increasingly globalized, such research is essential for developing effective, culturally-sensitive management practices that optimize both employee well-being and organizational performance.

The implications extend beyond the Iranian context, suggesting that organizational researchers and practitioners worldwide should consider cultural factors when developing theories and interventions related to stress and decision-making. The study's contribution to the literature on cultural differences in organizational behavior provides a foundation for future research that can enhance our understanding of how diverse cultural contexts shape the fundamental relationships between stress, cognition, and managerial effectiveness.

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