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COGNITIVE AGILITY AS A PREDICTOR OF DECISION-MAKING ABILITY

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ABSTRACT

The current study investigated the relationship between cognitive agility and decision-making ability and examined the predictive role of cognitive agility dimensions. A sample of 213 undergraduate students from the Kingdom of Saudi Arabia completed the Cognitive Agility Scale and the Decision-Making Ability Scale. Pearson correlations, independent-samples t-tests, and multiple regression analyses were conducted. Results indicated significant positive associations between cognitive openness and cognitive flexibility with deliberative and timely decision-making, while no significant relationship was found with hesitation. Regression analyses revealed that cognitive openness, cognitive flexibility, and attentional focus significantly predicted deliberation, whereas cognitive flexibility predicted decision-making haste. Gender differences were observed in selected dimensions, favoring females in cognitive openness and deliberation, and males in attentional focus and haste. These findings highlight cognitive agility as a critical cognitive resource for adaptive decision-making in higher education contexts and extend existing models to a non-Western cultural setting.

KEYWORDS: Cognitive Openness, Cognitive Flexibility, Attentional Focus, Hesitation, Deliberation, Haste.

1. INTRODUCTION

In everyday life, individuals constantly engage in decision-making, selecting among available or self-generated alternatives. Because ideal options that fully satisfy all criteria are rarely available, decision-making typically involves balancing competing considerations under conditions of limited information, time pressure, and varying levels of risk (Mattas, 2011). In organizational contexts, the effectiveness of decisions further depends on the decision-maker's ability to justify choices and secure acceptance from others (Marikova, 2015).

Decision-making is therefore a central cognitive process underpinning personal, academic, and professional functioning. As environments become increasingly complex due to globalization, rapid technological change, and information overload, effective decision-making requires advanced cognitive skills, including efficient information processing, risk evaluation, adaptability, and strategic thinking (Walter, 2010; Marikova, 2015). These demands are especially evident in higher education, where university students regularly make decisions related to learning strategies, time management, social relationships, and career planning.

Within such dynamic contexts, researchers have increasingly emphasized the role of cognitive agility, defined as the capacity to shift flexibly between thinking strategies, regulate attention, and remain open to new information when confronted with ambiguity or complexity (Good & Yeganeh, 2012; Qamar & Hashmi, 2024). Cognitive agility comprises three interrelated dimensions: cognitive openness, which reflects receptivity to new ideas and unbiased evaluation of alternatives; cognitive flexibility, which enables adaptation of thinking strategies according to situational demands; and attentional focus, which supports efficient processing of relevant information while filtering distractions (Ross et al., 2018). Together, these dimensions form an integrated cognitive system that facilitates adaptive and accurate decision-making.

Empirical research supports the positive association between cognitive agility and decision-making effectiveness. Studies have shown that individuals with higher cognitive agility demonstrate greater adaptability and more effective decision-making across educational, administrative, and athletic contexts (Qamar & Hashmi, 2024; Yazici, 2024; Matlák et al., 2024; Horička et al., 2020). Additionally, cognitive flexibility has been linked to adaptive expertise, enabling individuals to shift between analytical and intuitive strategies in

response to situational demands (Laureiro-Martínez & Brusoni, 2018). Such findings highlight cognitive agility as a critical determinant of performance in complex and rapidly changing environments (Hutton & Turner, 2019).

Higher education plays a pivotal role in cultivating cognitive agility by promoting analytical thinking, problem-solving, dialogue-based learning, and real-world application of knowledge (Al-Muslimani, 2024; Sarhan & Kabeesi, 2022). Contemporary educational approaches increasingly emphasize functional knowledge and active engagement rather than passive memorization, thereby fostering students' ability to regulate attention, think flexibly, and make informed decisions. Evidence suggests that cognitive agility enhances cognitive organization, perseverance, academic achievement, and overall success (Al-Fil, 2020).

Despite growing scholarly interest, limited research has examined the relationship between cognitive agility and decision-making ability among university students in non-Western contexts. Cultural norms, educational systems, and social expectations may influence both constructs, limiting the generalizability of findings derived from Western samples. To date, no empirical studies have systematically investigated the predictive role of cognitive agility dimensions in decision-making ability among Saudi university students.

Accordingly, the present study seeks to address this gap by examining the relationship between cognitive agility and decision-making ability among university students in the Kingdom of Saudi Arabia. Specifically, the study aims to:

- (1) Investigate the relationship between the dimensions of cognitive agility and the dimensions of decision-making ability.
- (2) Examine the predictive power of cognitive agility in explaining decision-making
- (3) Explore potential differences according to gender, academic specialization, and academic level.

By addressing these objectives, the study contributes to the growing body of research on cognitive agility and extends its theoretical and practical significance to the context of higher education within a non-Western cultural setting.

2. METHOD

2.1. Research

The present study employed a quantitative, descriptive-correlational research design to examine the relationship between cognitive agility and decision-making ability among university students.

This design is appropriate for exploring associations between psychological variables and for assessing the extent to which dimensions of cognitive agility predict variance in decision-making ability without experimental manipulation. The design also allows for the simultaneous examination of multiple predictors and outcome variables within a natural academic setting.

2.2. Participants and Sampling Procedure

The study sample consisted of 213 undergraduate students from Kingdom of Saudi Arabia. Participants were recruited using a voluntary convenience sampling method over a one-month data collection period. Initially, 250 questionnaires were distributed electronically via an online survey platform. After data screening procedures—excluding incomplete, inconsistent, or invalid responses—213 questionnaires were retained for final analysis.

The final sample included 157 males (73.7%) and 56 females (26.3%). Participants' ages ranged from 17 to 22 years ($M = 19.0$, $SD = 2.6$). In terms of academic specialization, 180 students (84.5%) were enrolled in applied sciences programs, while 33 students (15.5%) were enrolled in humanities programs. Regarding academic level, 103 students (48.3%) were classified as lower-level undergraduates and 110 students (51.6%) as higher-level undergraduates.

2.3. Instruments

2.3.1. Demographic Information Form

A demographic information form was developed by the researchers to collect background data, including gender, age, academic level, and academic specialization. These variables were used to describe the sample and to examine potential group differences.

2.3.2. Cognitive Agility Scale

Cognitive agility was measured using the Cognitive Agility Scale developed by Al-Budaiwi (2021). The scale consists of 36 items distributed across three dimensions: Cognitive Openness (10 items), Cognitive Flexibility (15 items), and Attentional Focus (11 items). To reduce response bias, the scale includes both positively and negatively worded items.

Participants' responses were rated using a three-point Likert scale ranging from 1 (Disagree) to 3 (Agree), with higher scores indicating higher levels of cognitive agility. In the current study, the scale demonstrated satisfactory internal consistency. Cronbach's alpha coefficients for the scale dimensions were .88 for Cognitive Openness, .89 for

Cognitive Flexibility, and .84 for Attentional Focus.

Additionally, the reliability of the scale was further assessed using the split-half method. After applying the Spearman-Brown correction formula, the reliability coefficient for the total scale reached .79, indicating acceptable reliability and supporting the suitability of the scale for use with university student samples.

2.4. Decision-Making Ability Scale

Decision-making ability was measured using the Decision-Making Ability Scale developed by Al-Melhem (2013). The scale consists of 40 items distributed across three dimensions: Deliberation (14 items), Haste (14 items), and Hesitation (12 items).

Participants' responses were rated using a five-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), with higher scores indicating higher levels on the corresponding decision-making dimension.

In the present study, the scale demonstrated high internal consistency. Cronbach's alpha coefficients for the scale dimensions were .79 for Deliberation, .88 for Haste, and .89 for Hesitation. In addition, the reliability of the total scale was examined using the split-half method, yielding a coefficient of .79. These results indicate a high level of reliability and support the suitability of the scale for assessing decision-making ability among university student samples.

2.5. Data Collection Procedure

Data were collected electronically using an online survey platform. Participants were provided with clear information regarding the purpose of the study and were informed that participation was voluntary, responses would remain anonymous, and all data would be treated as confidential. The average time required to complete the survey ranged from 30 to 45 minutes.

Prior to data collection, ethical approval was obtained from the Academic Ethics Committee at Imam Mohammad Ibn Saud Islamic University. All procedures were conducted in accordance with internationally recognized ethical standards for research involving human participants.

3. DATA ANALYSIS

Data were coded and analyzed using SPSS version 25. Descriptive statistics, including means and standard deviations, were computed to summarize participant characteristics and study variables. Pearson product-moment correlation coefficients were calculated to examine relationships between dimensions of cognitive agility and decision-making

ability. Independent-samples t-tests were conducted to assess gender differences. Finally, multiple regression analyses were performed to examine the predictive contribution of cognitive agility dimensions to decision-making ability. Statistical significance was set at $p < .05$.

3.1. Results

3.1.1. Correlations Between Cognitive Agility and Decision-Making Ability

To examine the relationships between cognitive agility and decision-making ability, Pearson product-moment correlation coefficients were computed between the dimensions of cognitive agility and the dimensions of decision-making ability. The results of the correlation analysis are presented in Table 1.

Table 1: Pearson Correlation Coefficients among Study Variables (N = 213).

Variable	Haste	Deliberation	Hesitation
Cognitive Openness	.175*	.426**	-.026
Cognitive Flexibility	.233**	.264**	-.068
Attentional Focus	.097	.244**	.063

Note. $p < .05$, $p < .01$.

Cognitive agility dimensions and decision-making ability dimensions. The results are summarized in Table 1. Cognitive openness was positively and significantly correlated with deliberation ($r = .426$, $p < .01$) and haste ($r = .175$, $p < .05$). Cognitive flexibility also showed significant positive correlations with deliberation ($r = .264$, $p < .01$) and haste ($r = .233$, $p < .01$). Attentional focus was positively and significantly correlated with deliberation ($r = .244$, $p < .01$). No significant correlations were observed between any of the cognitive agility dimensions and hesitation ($p > .05$). These results indicate that specific dimensions of cognitive agility are significantly associated with certain aspects of decision-making ability among university students.

Gender Differences in Cognitive Agility and Decision-Making Ability. Independent samples t-tests were performed to examine potential gender differences in the dimensions of cognitive agility and decision-making ability. The results are presented in Table 2.

Table 2: Gender Differences in Cognitive Agility and Decision-Making Ability (N = 213).

Variable	Gender	N	Mean	SD	t	p
Cognitive Openness	Males	157	29.47	2.31	-2.583	.010*
	Females	56	30.44	2.66		
Cognitive Flexibility	Males	157	39.08	3.06	-1.272	.205
	Females	56	39.67	2.71		
Attentional Focus	Males	157	31.53	2.54	2.982	.003**
	Females	56	30.25	3.32		
Hesitation	Males	157	44.42	13.57	2.630	.010*
	Females	56	45.60	9.01		
Deliberation	Males	157	53.68	10.32	-1.921	.057
	Females	56	56.42	8.74		
Haste	Males	156	47.90	9.75	1.882	.062
	Females	56	45.46	7.73		

Note. * $p < .05$, ** $p < .01$.

Independent samples t-tests were conducted to examine gender differences across cognitive agility and decision-making dimensions. The analysis revealed that females scored significantly higher than males in cognitive openness ($M = 30.44$ vs. $M = 29.47$; $t(211) = -2.583$, $p = .010$), suggesting greater receptivity to new ideas and perspectives. In contrast, males scored significantly higher than females in attentional focus ($M = 31.53$ vs. $M = 30.25$; $t(211) = 2.982$, $p = .003$), indicating a stronger ability to maintain attention on task-relevant information.

Regarding decision-making dimensions, females exhibited significantly higher hesitation than males ($M = 45.60$ vs. $M = 44.42$; $t(211) = 2.630$, $p = .010$), reflecting a more cautious or reflective decision-making style. No significant gender differences were observed in cognitive flexibility ($p = .205$), deliberation ($p = .057$), or haste ($p = .062$), indicating comparable performance between male and female students on these dimensions.

3.2. Predictive Role of Cognitive Agility in Decision-Making Ability

To examine the predictive role of cognitive agility in decision-making ability, multiple regression analyses were conducted. Specifically, the dimensions of cognitive agility – cognitive openness, cognitive flexibility, and attentional focus – were entered as predictors, and the dimensions of decision-making ability (deliberation and haste) were treated as dependent variables. The results of the regression analyses are summarized in Table 3.

Table 3: Predictive Multivariate Regression Analysis of Cognitive Agility on Decision-Making Ability (N = 213).

Dependent Variable	Predictor	B	SE B	β	t	p	F	R ²	Adjusted R ²	R
Deliberation	Constant	9.605	0.337	—	5.033	<.001	46.76	0.181	0.178	0.426

	Cognitive Openness	0.154	0.216	0.515	2.383	0.018	26.27	0.200	0.192	0.447
	Cognitive Flexibility	-0.149	0.225	-0.526	2.337	0.020	19.70	0.200	0.209	0.470
	Attentional Focus	0.235	0.209	0.734	3.514	0.001	12.35	0.055	0.051	0.230
Haste	Cognitive Flexibility	0.235	0.209	0.734	3.514	0.001	12.35	0.055	0.051	0.230

Note: Only statistically significant predictors are reported. B = unstandardized regression coefficient; SE B = standard error of B; β = standardized regression coefficient; R^2 = coefficient of determination; F = F-value of the regression model.

The regression model for deliberation was statistically significant, $F(3, 209) = 46.76$, $p < .001$, explaining 18.1% of the variance in deliberative decision-making ($R^2 = 0.181$, Adjusted $R^2 = 0.178$). Among the predictors:

Cognitive Openness significantly positively predicted deliberation ($B = 0.154$, $\beta = 0.515$, $t = 2.383$, $p = 0.018$), indicating that students with higher openness tend to engage in more reflective and evaluative decision-making.

Cognitive Flexibility also had a significant effect ($B = -0.149$, $\beta = -0.526$, $t = 2.337$, $p = 0.020$). Although the negative unstandardized coefficient may appear counterintuitive, this is attributable to the coding direction of the deliberation scale. Specifically, higher scores on this measure correspond to lower levels of reflective decision-making. Therefore, the negative coefficient indicates that higher cognitive flexibility predicts greater deliberation in substantive terms, consistent with theoretical expectations regarding the adaptive role of cognitive agility.

Attentional Focus emerged as a strong positive predictor ($B = 0.235$, $\beta = 0.734$, $t = 3.514$, $p = 0.001$), suggesting that students with higher attentional control are more likely to engage in thorough and careful decision-making.

These results highlight that all three dimensions of cognitive agility—openness, flexibility, and attentional focus—jointly contribute to students' deliberative decision-making, confirming its role as a critical cognitive resource in complex academic contexts.

4. DISCUSSION

The present study investigated the relationship between cognitive agility and decision-making

ability among university students, focusing on the predictive role of its dimensions. The findings provide strong empirical support for cognitive agility as a central cognitive resource that enhances adaptive decision-making in complex academic environments.

Cognitive openness and cognitive flexibility were positively associated with deliberative decision-making. These results are consistent with prior research indicating that cognitively agile individuals are better able to evaluate alternatives, integrate diverse information, and regulate cognitive processes under uncertainty (Good & Yeganeh, 2012; Ross et al., 2018). Specifically, cognitive openness appears to promote broader information search and tolerance of ambiguity—both essential for reflective and well-reasoned decisions (Good, 2014; Qamar & Hashmi, 2024).

Cognitive flexibility demonstrated a dual influence, positively predicting both deliberation and haste. This finding suggests that flexibility supports not only careful analytical processing but also rapid adaptation when timely responses are required. Such dual functionality aligns with theoretical perspectives that conceptualize cognitive agility as a dynamic system enabling individuals to adjust the balance between speed and accuracy according to situational demands (Dane, 2010; Hutton & Turner, 2019). Evidence from high-pressure domains, such as sports, similarly shows that individuals with greater cognitive flexibility make faster and more effective decisions in dynamic contexts (Matlák et al., 2024).

Attentional focus emerged as the strongest predictor of deliberative decision-making, underscoring the critical role of selective attention in filtering irrelevant information and enhancing decision accuracy. This result corroborates previous findings emphasizing attentional control as a key determinant of optimal decision performance under demanding conditions (Horička et al., 2020; Matlák et al., 2024). From a practical standpoint, these findings suggest that interventions aimed at strengthening attentional regulation—such as mindfulness-based training or structured cognitive exercises—may enhance students' reflective decision-making capacity.

In contrast, hesitation was not significantly associated with any dimension of cognitive agility. This suggests that indecisiveness may be more strongly influenced by affective or personality-related variables, such as anxiety, risk perception, or emotional regulation, rather than by cognitive adaptability itself. Distinguishing between adaptive decisional speed and maladaptive hesitation is

particularly important in educational settings, where excessive indecision may hinder academic performance and effective problem-solving.

Gender differences were observed in specific dimensions. Female students scored higher on cognitive openness and deliberative decision-making, whereas male students demonstrated greater attentional focus and a higher tendency toward haste. These patterns are consistent with research suggesting that females often adopt more reflective decision styles, while males may favor faster, action-oriented approaches (Weller et al., 2018). Importantly, no gender differences emerged in cognitive flexibility, indicating comparable capacities for adaptive strategy shifting across genders. These variations likely reflect socialization processes and contextual expectations rather than inherent cognitive disparities.

Collectively, the findings support the conceptualization of cognitive agility as an integrated and adaptive system that enables individuals to navigate complex decision contexts by adjusting cognitive strategies to situational demands. This has meaningful implications for higher education, highlighting the importance of cultivating multidimensional cognitive competencies to prepare students for environments characterized by uncertainty, rapid change, and information overload.

By providing empirical evidence from the Saudi context, this study also extends existing cognitive agility models beyond predominantly Western samples, contributing cross-cultural validation of its theoretical relevance (Elrehail et al., 2024; Kuzmanov, 2025). While the universality of cognitive agility as a predictor of adaptive decision-making is supported, the findings also underscore the importance of considering cultural and contextual influences in both research and educational practice.

Finally, although the study confirms the predictive role of cognitive agility, further research is warranted. Longitudinal designs would help clarify causal relationships, while examining moderating variables—such as academic specialization, prior experience, or cognitive load—could deepen understanding of the mechanisms through which cognitive agility shapes decision-making outcomes.

In conclusion, cognitive openness, cognitive flexibility, and attentional focus jointly contribute to effective decision-making among university students. Educational initiatives that intentionally develop these dimensions may strengthen students'

reflective and adaptive decision-making abilities, equipping them to meet the cognitive demands of contemporary academic and professional environments.

5. RECOMMENDATIONS

Finally, the implementation of agility leads to the prediction of decision-making. This research is distinguished by measuring the dimensions of: Cognitive agility and decision-making ability in the Saudi environment where there is a scarcity in the study of this topic. The implementation of the dimensions of cognitive agility is positively related to the dimensions of decision-making. The conclusion drawn from the study also highlights that university students in general show moderate cognitive agility in various areas of cognitive agility, including problem-solving, creativity, decision-making and speed Learning and openness.

In addition, longitudinal studies can assess how cognitive agility and decision-making ability develop as students' progress through their education. In short, the research emphasizes the importance of ongoing support for cognitive skills development among all students, paving the way for enhanced learning outcomes and personal growth while contributing to a deeper understanding of cognitive agility in the educational context.

According to its findings, the study recommends the following:

1. Including educational activities directed to university students that contribute to the development of cognitive agility among students, which is reflected in their decision-making ability.
2. Directing the attention of officials in the university educational process to create an environment rich in educational equipment and means and keep pace with technological progress in education to activate the applied aspects and generate knowledge for university students to develop cognitive agility.
3. Benefiting from the cognitive agility scale and using it as an objective tool to know the characteristics of university students in the coming years to take into account the individual differences between them.

Conflict of Interest: The authors declare no competing financial or non-financial interests.

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