



MULTIVARIATE STATISTICAL MODELLING OF ECONOMIC DECISION-MAKING: QUANTIFYING MINDFULNESS, RISK PREFERENCES, AND COGNITIVE FACTORS

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Abstract

There are various cognitive, psychological and behavioural factors that interact in economic decision-making, but the combined effect of mindfulness, risk preferences and cognitive factors is not fully understood. Using data from 645 respondents, this study employed a multivariate statistical approach to assess the relationships between mindfulness, risky economic choice, delayed-reward preference, financial literacy, cognitive reflection, impulsivity and trust. A 39-item composite mindfulness scale was used for measuring mindfulness, and a structured decision measure and question-based measures for economic preferences and cognitive-behavioural factors were used. Descriptive statistics, Spearman correlations, Kruskal–Wallis tests and multivariable regression models with HC3 robust standard errors were used. Mindfulness was positively associated with financial literacy and cognitive reflection and negatively associated with impulsivity. The mindfulness scale demonstrated good internal consistency, whereas the impulsivity measure showed moderate internal consistency. The link with risky lottery decisions or delayed reward preference, however, was not significant nor was it linked to mindfulness. At bivariate level, financial literacy was negatively associated with risk taking and positively associated with patience. Significant differences in financial literacy, cognitive reflection and impulsivity were found across tertiles of mindfulness, while risky choice and patience were not significantly different. However, in models that controls for psychological factors, only impulsivity significantly predicted fewer delayed-reward selections, with higher levels of impulsivity predicting fewer choices. Mindfulness was generally more closely linked with cognitive and self-regulatory factors than with actual economic preferences, and this suggests the need for an integrated multivariate treatment of the understanding of individual economic decision-making.

Keywords: mindfulness; economic decision-making; risk preference; financial literacy; cognitive reflection

1. Introduction

Cognitive ability, psychological disposition, financial knowledge, risk tolerance and intertemporal preferences all influence economic decision making. The standard economic theory of rational choice assumes that people make rational decisions and select the optimal alternative according to their perceived utility. Behavioural and experimental studies, however, demonstrate that the cognitive and psychological factors vary among individuals and affect financial and economic decisions in the real world. Variations in risk-taking attitudes, level of patience, reflection, trust and impulsivity may affect how people deal with information and how they react to uncertainty. In recent years, therefore, research has turned to multivariate methods that combine cognitive and behavioural aspects when making economic and financial decisions (Farago et al., 2022; Reeck et al., 2022).

Within this literature, "mindfulness" has become a relevant concept in greater and greater ways. It captures awareness of current experiences and thoughts, feeling, and behaviour. This knowing can impact economic conduct by enhancing the sense of self-control and minimizing impulsiveness. Research indicates that trait and state mindfulness is linked to variations in risk preference, but the relationship among them is influenced by the measurement of risk (Zhang et al., 2021). Similarly, Aumeboonsuke and Caplanova (2023) demonstrated that the mindfulness and personality traits are responsible for explaining variation in investment-related risk aversion among individuals.

More recently this relationship was extended to economic preferences. Previous research by Duchêne et al. (2024) reveals that mindfulness can be associated with different economic preferences under different conditions, and that these preferences can be expressed in different ways—either verbally or through actions. There are some experimental findings that suggested that mindfulness meditation can affect choices that involve risk and delayed outcomes (Bulla-Holthaus et al., 2025). These results indicate that mindfulness works indirectly through cognitive control, emotional regulation, and decreased impulsivity instead of directly influencing a specific economic behavior. Similarly, Donate et al. (2023) emphasized the potential of mindfulness interventions to impact decision making, inhibitory control and impulsivity.

Cognitive reflection is another aspect of economic decision making because it takes into account the tendency to overrule intuitive but erroneous responses with deliberate reasoning. Meyer et al. (2024) found that cognitive reflection is a measurable trait, and Criado-Perez et al. (2024) demonstrated that cognitive reflection can enhance the accuracy of decisions in specific tasks and contexts. Cognitive skills can affect the quality of the decision without altering preferences (in economic contexts). Mechera-Ostrovsky et al. (2022) showed that cognitive ability is more closely associated with decision errors than with risk preferences.

Financial literacy is another thought process that people use to assess uncertainty and to make comparisons between options. It embraces information that is essential for comprehending financial concepts and outcomes over time and risk. Lusardi and Mitchell (2023) made a point of its significance in terms of financial capability and economic wellbeing. Evidence also shows that financial literacy is related to financial risk-taking attitudes and financial interests (Hermansson & Jonsson, 2021). Oberrauch and Kaiser (2022) also demonstrated that cognitive ability and financial literacy matter for eliciting time preferences and that elicited economic preferences might partly be a reflection of cognitive ability and information processing.

This financial literacy-risk-taking relationship is particularly concerning to investment behaviour. Financial literacy also was shown to relate with financial risk tolerance and risky financial behaviour by Song et al. (2023), and Mohta and Shunmugasundaram (2024) demonstrated that financial literacy can moderate the relationship between financial risk tolerance and risky financial behaviour. However, findings from younger cohorts also suggest a link between financial education and other economic preferences and behaviours (Razen et al., 2021). These results confirm the importance of considering risk-taking together with cognitive and financial features.

The third aspect of economic decision making comes from intertemporal choice. The decision of immediate versus delayed rewards involves weighing short-term pleasure against possible greater rewards later. Delayed choice is associated with individual differences in cognition, personality and behaviour (Yeh et al., 2021). Similar findings of significant variation between individuals in their intertemporal decision making were reported by Keidel et al. (2021) who also noted that cognitive and psychological factors are key sources of variability. Another interpersonal attitude that was linked to patience was reported by Pfann and Pfann (2025) who found that there was a relationship between patience and trust.

Trust and impulsivity are complementary constructs in a multivariate model of economic behaviour. Trust can impact on the expectations of others and institutions, while impulsivity can change decisions to pursue short-term gains or less reflective actions. The authors of Sabater-Grande et al. (2022) established an association between risk attitudes and personality traits on the one hand and trust and reciprocity on the other, suggesting that there are links between behavioural preferences and trust.

The present study therefore uses a multivariate statistical approach to measure the relationships between mindfulness, risk preferences, delayed economic choice, financial literacy, cognitive reflection, impulsivity and trust. It explores the direct relationship between mindfulness and economic preferences as well as the more indirect relationship with cognitive and self-regulatory attributes. The study also compares and analyses the relative contribution of cognitive and behavioural factors in relation to risk-taking and delayed economic choice.

2. Methodology

2.1 Research Design and Data Source

This study had a quantitative, cross-sectional secondary data design to investigate the relationships between mindfulness, economic risk preferences, delayed economic choice, financial literacy, cognitive reflection, impulsivity, and trust (Blackwell, 2023). The data provided for mindfulness and economic preferences was used for analysis. Qualtrics metadata rows and survey-preview entries were identified at the initial screening and removed prior to statistical analysis. After

data cleansing, the analytic sample consisted of 645 valid respondents.

2.2 Variable Construction

A 39-item mindfulness scale was used to measure mindfulness. Items that have negative wording were reverse scored prior to calculating the composite mindfulness score, such that higher scores indicate higher mindfulness.

Risk preference was measured by the number of relatively risky lottery options chosen over a series of five decision tasks. Thus, higher scores indicated higher levels of risk-taking.

Patience (delayed economic choice) was determined by the number of alternatives chosen in eight intertemporal choice items. The higher scores indicated a higher preference for delayed rewards.

Financial literacy was defined as the number of right answers for 3 financial-literacy questions. The three-item Cognitive Reflection Test was used to assess cognitive reflection, and the final score was the number of items correctly answered.

A 10-item impulsivity measure was used to calculate impulsivity, and the available trust score in the dataset was used as a representation of interpersonal trust.

2.3 Reliability Analysis

Cronbach's alpha was used for internal consistency of multi-item psychological scales. Prior to statistical modelling, the 39-item mindfulness scale and the 10-item impulsivity measure were both analysed for reliability.

2.4 Descriptive Statistical Analysis

Descriptive statistics were computed for the mindfulness, risky choices, delayed-reward choices, financial literacy, cognitive reflection, impulsivity, and trust scales. The number of valid observations, mean, standard deviation, minimum and maximum were included in the analysis. Additionally, the mindfulness composite scores and the number of risky options that participants chose were analyzed using frequency distributions.

2.5 Correlation Analysis

Spearman rank-order correlation coefficients were used to analyze the correlations of the main study variables. This is a non-parametric correlation method that was used to test the relationships between mindfulness, risky choices, patience, financial literacy, cognitive reflection, impulsivity and trust. Corresponding p-values were used to assess statistical significance.

2.6 Mindfulness Group Comparisons

Participants were split into an approximately equal number of those in the low, moderate, and high tertiles of overall mindfulness to see if there were differences in economic and cognitive outcomes across these groups. The Kruskal–Wallis test was used to compare the results of the three mindfulness groups for risky choices, patience, financial literacy, cognitive reflection and impulsivity. Effect size was measured with the use of the statistic epsilon-squared (ϵ^2) for statistically analyzed group differences.

2.7 Multivariable Regression Analysis

Multiple regression analysis was used to explore the independent relationship between risky economic choice and mindfulness. Demographic control variables and then the addition of mindfulness to the initial model. Fully adjusted model consisted of mindfulness, financial literacy, cognitive reflection, impulsivity, trust, age, gender, education, and household income. The same set of psychological, cognitive and demographic predictors were used for a parallel multivariable regression model with delayed economic choice as the dependent variable. Heteroskedasticity-consistent HC3 robust standard errors were used in both regression analyses. Regression results were assessed based on unstandardized coefficients, p values, 95 % confidence intervals, coefficient of determination (R^2) and adjusted coefficient of determination (R^2 adjusted). To illustrate the relative effects of the predictors in the risk-taking model, standardized coefficients with 95% confidence intervals were also computed.

2.8 Statistical Significance

All tests used were two-tailed and $p < .05$ was regarded as statistically significant.

3. Results

645 valid respondents were left to be analyzed after removing Qualtrics metadata rows and survey-preview data. The analysis included mindfulness, risk-taking, economic delay, financial literacy, cognitive reflection, impulsivity and interpersonal trust. The 39-item mindfulness instrument was reverse scored and then summed to create a score for mindfulness. The scale demonstrated good internal consistency (Cronbach's $\alpha = .836$). Moderate internal consistency ($\alpha = .648$) was found for the 10-item impulsivity composite.

3.1 Descriptive Statistics of the Main Study Variables

Table 1 shows descriptive statistics of the variables used in the multivariate analysis. The mean score on the five-point scale was 3.21 ± 0.42 , which was considered as moderate mindful awareness. The participants chose the higher-risk lottery option on average 2.17 times across the five options and the mean choice for the delayed reward option was 2.35 times out of 8 options.

Financial literacy performance was moderate to low, with the respondents correct 1.49 of 3 questions. Similar scores were obtained in performance on the three-item Cognitive Reflection Test (CRT) ($M = 0.37$, $SD = 0.74$). The mean impulsivity score was 2.31 ± 0.47 , whereas the mean trust score was 1.74 ± 0.84 .

Table 1. Descriptive Statistics for Mindfulness, Economic Preferences, and Cognitive Factors

Variable	N	Mean	SD	Minimum	Maximum
Mindfulness	645	3.213	0.422	1.769	4.744

Risky choices	644	2.165	1.463	0	5
Patience/delayed choices	645	2.346	2.307	0	8
Financial literacy	645	1.487	1.048	0	3
Cognitive Reflection Test	645	0.374	0.744	0	3
Impulsivity	645	2.311	0.470	1.000	3.500
Trust	636	1.737	0.843	1	3

Note. Higher risk-choice scores represent more selections of the relatively risky lottery. Higher patience scores indicate a greater number of delayed-reward choices.

As shown in Figure 1, scores for mindfulness were clustered in the middle range of the scale with some significant variation among subjects. The distribution was therefore adequate in terms of variability to support the subsequent correlational and regression modelling.

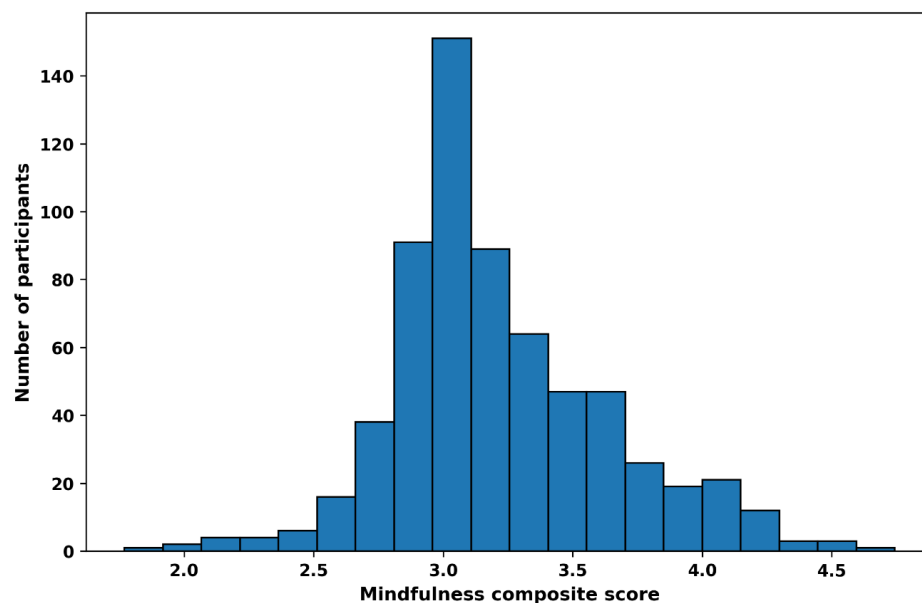


Figure 1. Distribution of Mindfulness Composite Scores

The distribution of risk taking decisions is presented in Figure 2. There was high interindividual variability in the number of risky alternatives chosen, suggesting it was a measure of economic choice.

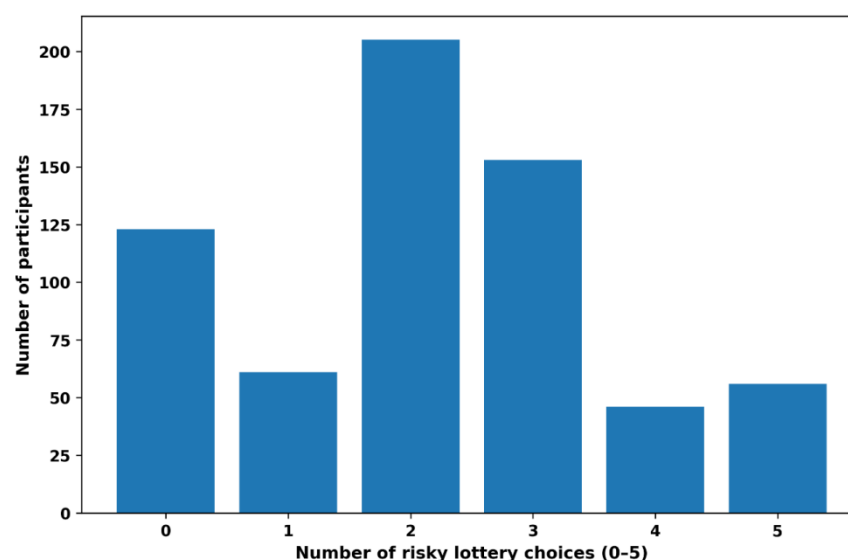


Figure 2. Distribution of Risk-Taking Choices Across Participants.

3.2 Associations Among Mindfulness, Risk Preferences, and Cognitive Factors

Some of the economic and cognitive measures were either discrete or bounded, thus Spearman rank correlations were calculated. These results are summarized in a tabular form (Table 2) and graphically presented (Figure 3).

Financial literacy and CRT performance were positively correlated with mindfulness ($\rho = .232, p < .001$) and ($\rho = .147, p$

$< .001$), respectively. One particularly significant negative correlation was found between mindfulness and impulsivity ($\rho = -.445$, $p < .001$); that is, people high on mindfulness tended to be quite low on impulsivity. Interpersonal trust was also slightly positively related to mindfulness ($\rho = .087$, $p = .029$).

In contrast, there were no significant relationships of mindfulness to risky lottery choices ($\rho = -.013$, $p = .740$), nor to delayed-reward preference ($\rho = -.009$, $p = .828$). Mindfulness therefore was more strongly linked to cognitive and behavioral-regulation characteristics than the two direct measures of economic choice.

There was a negative correlation between financial literacy and risk taking ($\rho = -.085$, $p = .030$) and a positive correlation between financial literacy and patience ($\rho = .119$, $p = .002$). There was also a moderate positive association between financial literacy and CRT performance ($\rho = .329$, $p < .001$). Impulsivity was negatively related to patience ($\rho = -.118$, $p = .003$), financial literacy ($\rho = -.220$, $p < .001$), CRT performance ($\rho = -.145$, $p < .001$), and trust ($\rho = -.141$, $p < .001$).

Table 2. Spearman Correlations Among the Main Study Variables

Variable	1	2	3	4	5	6	7
1. Mindfulness	1.000						
2. Risky choices	-.013	1.000					
3. Patience	-.009	.070	1.000				
4. Financial literacy	.232***	-.085*	.119**	1.000			
5. CRT	.147***	-.043	.071	.329***	1.000		
6. Impulsivity	-.445***	.029	-.118**	-.220***	-.145***	1.000	
7. Trust	.087*	-.036	.085*	.121**	.078	-.141***	1.000

Note. CRT = Cognitive Reflection Test. $p < .05$; $p < .01$; $p < .001$.

The correlation heatmap in Figure 3 shows that mindfulness and impulsivity were most strongly bivariate associated, as were financial literacy and cognitive reflection.

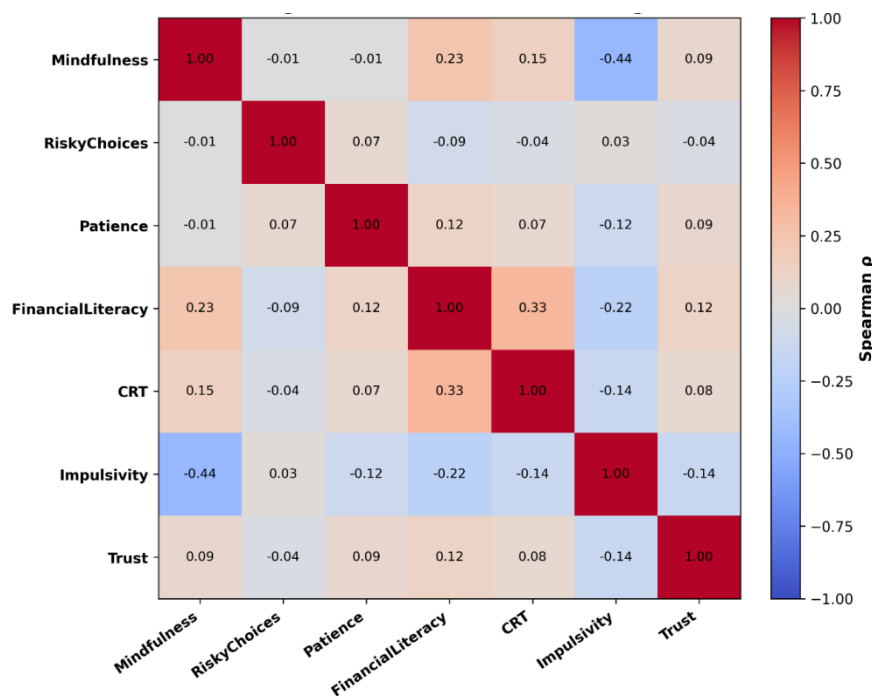


Figure 3. Spearman Correlation Heatmap for Economic, Mindfulness, and Cognitive Measures

3.3 Economic and Cognitive Differences Across Mindfulness Levels

The respondents were split into three roughly equal groups based on their total mindfulness scores to assess if scores on economic and cognitive outcomes differed across these total scores. Kruskal–Wallis tests were used for several outcomes that were non-normal bounded scores.

There was no significant difference between the mindfulness groups in terms of risky economic decisions: $H(2) = 2.78$, $p = .249$. The average mean score of the low, medium, and high mindfulness groups were 2.15, 2.27, and 2.07 respectively. Likewise, there was no significant difference between the categories of mindfulness in terms of delayed-reward preference, $H(2) = 0.32$, $p = .854$.

There were significant differences in financial literacy, $H(2) = 54.41$, $p < .001$, but the effect size was relatively small ($\epsilon^2 = .082$). The mean financial-literacy scores were 1.93 and 1.25 for the high- and low-mindfulness groups, respectively.

CRT performance also differed significantly, $H(2) = 16.74$, $p < .001$, $\epsilon^2 = .023$. Most notably, impulsivity showed the strongest group difference, $H(2) = 110.57$, $p < .001$, $\epsilon^2 = .169$. The mean impulsivity was reduced from 2.52 for the low mindfulness group to 2.04 for the high mindfulness group. The complete comparison of economic and cognitive outcomes across mindfulness tertiles is presented in Table 3.

Table 3. Comparison of Outcomes Across Mindfulness Tertiles

Outcome	Low Mindfulness M	Moderate M	High Mindfulness M	H	p	ϵ^2
Risky choices	2.148	2.267	2.072	2.779	.249	.001
Patience	2.384	2.403	2.245	0.316	.854	<.001
Financial literacy	1.245	1.308	1.928	54.414	<.001	.082
CRT	0.282	0.339	0.505	16.742	<.001	.023
Impulsivity	2.517	2.366	2.039	110.571	<.001	.169

The frequency of risky choices did not significantly differ by category of mindfulness, as illustrated in Figure 4. This confirms the result that the direct relationship between the lottery-based measure of risk preference and mindfulness is not significant.

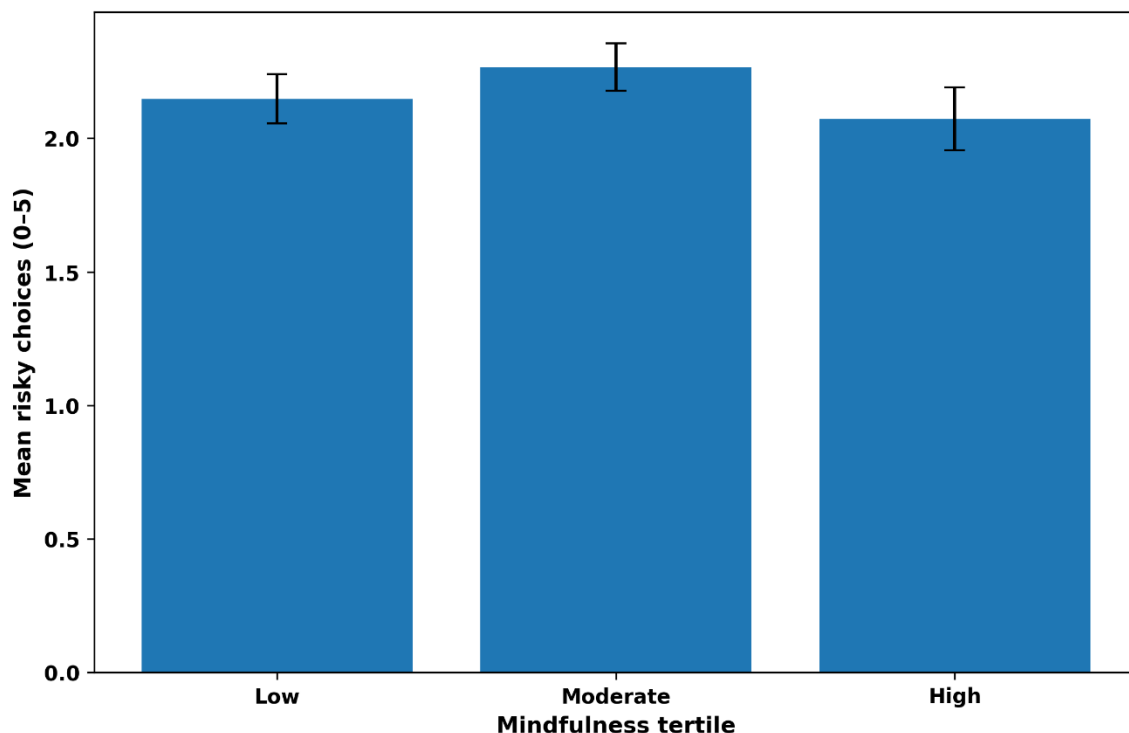


Figure 4. Mean Risk-Taking Scores Across Low, Moderate, and High Mindfulness Groups

3.4 Multivariable Modelling of Risk-Taking

Demographic variables were accounted for in hierarchical multivariable regression to test whether the risk-taking was uniquely accounted for by mindfulness or cognitive variables. Robust standard errors (HC3) were used to correct for heteroskedasticity.

Little variation in risky choices was explained by the demographic-only model ($R^2 = .007$). The incremental explanatory power ($R^2 = .007$) of adding mindfulness was almost nonexistent, and mindfulness was not statistically significant ($B = 0.089$, $p = .585$).

Overall, the level of explanatory power was low, even in the fully adjusted model that included mindfulness, financial literacy, CRT, impulsivity, trust, age, gender, education, and income ($R^2 = .015$, adjusted $R^2 = .001$). Mindfulness was again not a significant independent predictor ($B = 0.156$, 95% CI $[-0.210, 0.521]$, $p = .404$). Financial literacy had a negative coefficient, but failed to be significant after simultaneous adjustment ($B = -0.090$, $p = .148$). Similarly, CRT, impulsivity, and trust were also not significant independent predictors of risky lottery choice.

3.5 Multivariable Modelling of Delayed Economic Choice

A parallel model was estimated for the patience or delayed reward score. The entire model accounted for about 3.1% of the variance in delayed choice ($R^2 = .031$, adjusted $R^2 = .017$).

The only psychologically significant predictor that was statistically significant was impulsivity. Higher impulsivity was associated with fewer delayed-reward selections ($B = -0.539$, 95% CI $[-1.033, -0.045]$, $p = .032$). After simultaneous

adjustment, mindfulness was not independently significant ($B = -0.399$, $p = .151$), nor was financial literacy ($p = .167$), CRT ($p = .568$) or trust ($p = .242$).

The fully adjusted regression coefficients for risk-taking and delayed economic choice are presented in Table 4.

Table 4. Fully Adjusted Regression Models Predicting Risk-Taking and Delayed Economic Choice

Predictor	Risky Choices B	p	Patience B	p
Mindfulness	0.156	.404	−0.399	.151
Financial literacy	−0.090	.148	0.136	.167
CRT	−0.057	.500	0.073	.568
Impulsivity	0.053	.732	−0.539	.032
Trust	−0.081	.260	0.128	.242
Age	−0.094	.111	−0.091	.339
Female	−0.071	.570	−0.162	.413
Education	0.028	.534	0.061	.362
Household income	−0.085	.200	0.035	.732
Model R²	.015		.031	
Adjusted R²	.001		.017	

Note. Unstandardized regression coefficients are reported. Models used HC3 heteroskedasticity-robust standard errors. CRT = Cognitive Reflection Test.

The standardized coefficients and 95% confidence intervals for the risk-taking model are shown in Figure 5. The 95% confidence intervals for the principal predictors crossed zero, visually confirming the absence of statistically significant independent predictor effects on risky lottery choices.

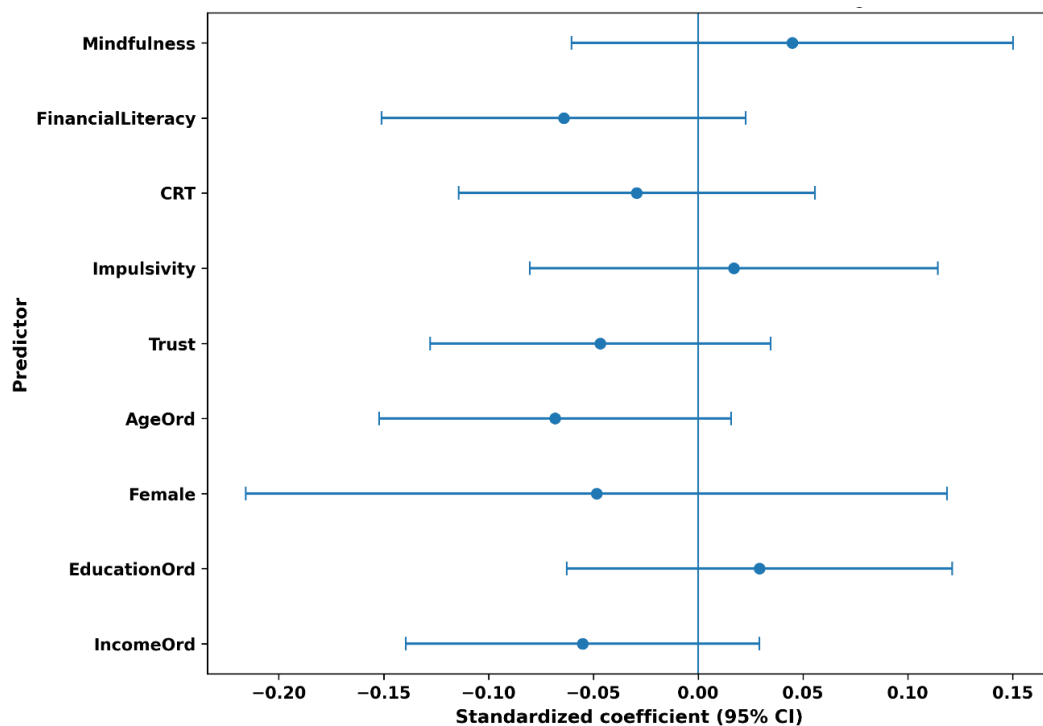


Figure 5. Standardized Multivariable Predictors of Risk-Taking With 95% Confidence Intervals

4. Discussion

Although there were no direct links between mindfulness and risky lottery behaviors or delayed-reward preferences, there was a strong link between mindfulness and decreased impulsivity and a positive link between mindfulness and financial literacy and cognitive reflection. Mindfulness might thus be more related to self-regulation than to apparent economic

preferences. This is consistent with the evidence that mindfulness does not consistently alter risk or time preferences, which affect decision processes (Duchêne et al., 2024; Zhang et al., 2021).

There is no direct mindfulness-risk relationship, which is notable as previous studies have yielded mixed results. Aumeboonsuke and Caplanova (2023) have demonstrated that an individual's risk aversion is related to their mindfulness and personality traits, while Bulla-Holthaus et al. (2025) illustrate that under specific cognitive conditions, mindfulness meditation influences investors' risk and time decisions. Other findings on the effects of mindfulness on inhibitory control and impulsivity were reported by Donate et al. (2023) and the effects of mindfulness on the decision processes in moral contexts were reported by Du et al. (2023). These results indicate that there may be a regulatory pathway by which mindfulness is involved in risk-taking behavior, but it is not necessarily the pathway.

One of the strongest negative correlations was between mindfulness and impulsivity. Additionally, there was only one psychological factor that independently predicted delayed economic choice, with higher impulsivity predicting fewer delayed-reward choices. This is consistent with cognitive control, personality, and self-regulatory tendencies influencing intertemporal decisions (Keidel et al., 2021; Yeh et al., 2021). Fossen et al. (2025) identified a relationship between cognitive reflection, individual preferences, and socioeconomic outcomes, highlighting the importance of cognitive and self-regulatory processes in shaping patience and financial decision-making.

At the bivariate level, financial literacy was positively related to mindfulness and negatively related to risky decisions, but was not significant in the adjusted models. This is in line with findings that financial literacy correlates with risk attitudes, financial behaviour and financial investments (Hermansson & Jonsson, 2021; Song et al., 2023). Agnew et al. (2025) pointed out that cognitive ability plays a significant part in financial literacy, and Hayashi and Routh (2025) revealed that financial literacy and risk tolerance are related to holding cryptocurrencies. Similarly, Liu et al. (2025) demonstrated that financial literacy has an impact on investment via risk and time preferences.

There was a positive correlation between mindfulness and cognitive reflection, which implies a connection between mindful awareness and intentional reasoning. It has been found that cognitive reflection is a measurable trait that is correlated with decision accuracy (Meyer et al., 2024; Criado-Perez et al., 2024). But, cognitive reflection was not a unique predictor of risky choice in the present regression model. This result aligns with Mechera-Ostrovsky et al., 2022, who found that cognitive abilities have a more consistent impact on decision errors than risk preferences. However, Farago et al. (2022) demonstrated that cognitive skills and economic preferences can still be empirically differentiated.

There were weak relationships between trust and measures of economic choice. This aligns with the literature which considers trust and risk preferences as related and distinct. Herrera and Willinger (2025) discovered that there were differences between different levels of risk tolerance and their level of trustfulness, while Pfann and Pfann (2025) related trust with patience. Keefer et al. (2022) were able to show that trust, risk and time preferences can all interact to influence economic behaviour, while Sabater-Grande et al. (2022) were able to reveal that personality and risk attitudes can both be linked to trust and reciprocity.

However, the lack of explanatory power in the regression models suggests that there may be other behavioral and contextual factors influencing economic risk-taking and delayed choice. Risk tolerance, behavioural biases, financial information environments, and financial decision styles have been highlighted in previous studies as key factors in financial decision making (Hussain & Rasheed, 2023; Gambetti et al., 2022; Shah et al., 2024). Financial behaviour is modifiable by financial education and decision environments, as shown by Isler et al. (2022) and Sconti et al. (2024).

In summary, these results provide support for a multivariate approach to economic decision making, highlighting a relationship between mindfulness and cognitive and self-regulatory, as opposed to direct economic, aspects. There is evidence that risk preferences differ between economic and non-economic situations (Reeck et al., 2022) and that higher-order preferences can have complicated reflection effects (Bleichrodt & Bruggen, 2022), and this distinction is clear. Results corroborate the viability of studying mindfulness, cognition, financial knowledge, impulsivity, trust and economic preferences simultaneously and not necessarily as direct and one-to-one relationships.

5. Conclusion

This study offers a multivariate examination of economic decisions, by considering the interconnections between mindfulness, risk preferences, delayed economic choice, financial literacy, cognitive reflection, impulsivity, and trust. The results illustrate that mindfulness had a stronger correlation with cognitive and self-regulatory features than with actual monetary decisions. Higher mindfulness was significantly associated with lower impulsivity and with higher financial literacy and cognitive reflection, while its associations with risky lottery choice and delayed-reward preference were not significant. The findings suggest that mindfulness may have more of a behavioural regulation effect and a reflective cognitive effect on economic decision making than a direct effect on risk or time preferences.

Of the measured psychological variables, impulsivity proved to be especially relevant to intertemporal choice, as higher levels of impulsivity predicted lower numbers of delayed reward choices independently of other variables. Financial literacy showed significant but modest bivariate associations with risk-taking and patience; however, these relationships were no longer statistically significant after simultaneous adjustment for cognitive, psychological, and demographic factors. The relatively small explanatory power of the regression models also suggests that other factors beyond those studied here play a role in economic decisions.

The study emphasizes the importance of introducing psychological, cognitive and economic factors in a common statistical model. Longitudinal and experimental studies in the future will help to elucidate the causal relationships between the variables and help to establish if differences in financial and economic behavior persist after mindfulness and self-regulation are altered.

References

1. IEA P. WorlAgnew, S., Roger, P., & Roger, T. (2025). Financial literacy, cognitive abilities and gender gap. The Quarterly Review of Economics and Finance, 102098.
2. Aumeboonsuke, V., & Caplanova, A. (2023). An analysis of impact of personality traits and mindfulness on risk aversion of individual investors. Current Psychology, 42(8), 6800-6817.
3. Bleichrodt, H., & Bruggen, P. V. (2022). The reflection effect for higher-order risk preferences. Review of Economics and Statistics, 104(4), 705-717.
4. Blackwell, C. (2023). Mindfulness and economic preferences (Version 1) [Data set]. Mendeley Data. <https://doi.org/10.17632/3jxmmfzhyp.1>
5. Bulla-Holthaus, N., Kairies-Schwarz, N., & Mussio, I. (2025). The effects of cognitive load and mindfulness meditation on decisions related to risk and time. Journal of Behavioural and Experimental Economics, 118, 102412.
6. Criado-Perez, C., Jackson, C., Minbashian, A., & Collins, C. G. (2024). Cognitive reflection and decision-making accuracy: Examining their relation and boundary conditions in the context of evidence-based management. Journal of Business and Psychology, 39(1), 249-273.
7. Donate, A. P. G., de Macedo, E. C., Bedendo, A., Felix Junior, I., Gallo, G. G., Opaleye, E. S., & Noto, A. R. (2023). The effect of mindfulness on decision-making, inhibitory control, and impulsivity of substance use disorder in-treatment patients: A randomized clinical trial. PloS one, 18(11), e0293502.
8. Du, W., Yu, H., Liu, X., & Zhou, X. (2023). Mindfulness training reduces slippery slope effects in moral decision-making and moral judgment. Scientific Reports, 13(1), 2967.
9. Duchêne, S., Guillon, M., & Rafäi, I. (2024). Association between mindfulness and risk and time preferences. Journal of the Economic Science Association, 10(2), 199-212.
10. Farago, A., Holmén, M., Holzmeister, F., Kirchler, M., & Razen, M. (2022). Cognitive skills and economic preferences in the fund industry. The Economic Journal, 132(645), 1737-1764.
11. Fossen, F. M., Neyse, L., & Schröder, C. (2025). Does Cognitive Reflection Relate to Preferences and Socioeconomic Outcomes?. Journal of Political Economy Microeconomics, 3(2), 303-343.
12. Gambetti, E., Zucchelli, M. M., Nori, R., & Giusberti, F. (2022). Default rules in investment decision-making: trait anxiety and decision-making styles. Financial innovation, 8(1), 23.
13. Hayashi, F., & Routh, A. (2025). Financial literacy, risk tolerance, and cryptocurrency ownership in the United States. Journal of Behavioural and Experimental Finance, 46, 101060.
14. Hermansson, C., & Jonsson, S. (2021). The impact of financial literacy and financial interest on risk tolerance. Journal of Behavioural and Experimental Finance, 29, 100450.
15. Herrera, D. M., & Willinger, M. (2025). Are risk-tolerant individuals more trustful? A representative sample study. Journal of the Economic Science Association, 11(1), 58-79.
16. Hussain, S., & Rasheed, A. (2023). Risk tolerance as mediating factor in individual financial investment decisions: a developing-country study. Studies in Economics and Econometrics, 47(2), 185-198.
17. Isler, O., Rojas, A., & Dulleck, U. (2022). Easy to shove, difficult to show: Effect of educative and default nudges on financial self-management. Journal of Behavioural and Experimental Finance, 34, 100639.
18. Keefer, P., Scartascini, C., & Vlaicu, R. (2022). Demand-side determinants of public spending allocations: Voter trust, risk and time preferences. Journal of Public Economics, 206, 104579.
19. Keidel, K., Rramani, Q., Weber, B., Murawski, C., & Ettinger, U. (2021). Individual differences in intertemporal choice. Frontiers in psychology, 12, 643670.
20. Liu, G., Li, Y., & Xu, D. (2025). How does financial literacy affect farmers' agricultural investments? A study from the perspectives of risk preferences and time preferences. Applied Economics, 57(14), 1527-1541.
21. Lusardi, A., & Mitchell, O. S. (2023). The importance of financial literacy: Opening a new field. Journal of Economic Perspectives, 37(4), 137-154.
22. Mechera-Ostrovsky, T., Heinke, S., Andraszewicz, S., & Rieskamp, J. (2022). Cognitive abilities affect decision errors but not risk preferences: A meta-analysis. Psychonomic Bulletin & Review, 29(5), 1719-1750.
23. Meyer, A., Attali, Y., Bar-Hillel, M., Frederick, S., & Kahneman, D. (2024). Cognitive reflection is a distinct and measurable trait. Proceedings of the National Academy of Sciences, 121(49), e2409191121.
24. Mohta, A., & Shunmugasundaram, V. (2024). Moderating role of millennials' financial literacy on the relationship between risk tolerance and risky investment behaviour: evidence from India. International Journal of Social Economics, 51(3), 422-440.
25. Oberrauch, L., & Kaiser, T. (2022). Cognitive ability, financial literacy, and narrow bracketing in time-preference elicitation. Journal of Behavioural and Experimental Economics, 98, 101844.
26. Pfann, F., & Pfann, G. (2025). On patience and trust. Applied Economics Letters, 32(19), 2836-2842.
27. Razen, M., Huber, J., Hueber, L., Kirchler, M., & Stefan, M. (2021). Financial literacy, economic preferences, and adolescents' field behaviour. Finance Research Letters, 40, 101728.
28. Reeck, C., Mullette-Gillman, O. D. A., McLaurin, R. E., & Huettel, S. A. (2022). Beyond money: Risk preferences across both economic and non-economic contexts predict financial decisions. PLoS One, 17(12), e0279125.
29. Sabater-Grande, G., Garcia-Gallego, A., Georgantzis, N., & Herranz-Zarzoso, N. (2022). The effects of personality, risk and other-regarding attitudes on trust and reciprocity. Journal of Behavioural and Experimental Economics, 96, 101797.
30. Sconti, A., Caserta, M., & Ferrante, L. (2024). Gen Z and financial education: Evidence from a randomized control trial in the South of Italy. Journal of behavioural and experimental economics, 112, 102256.

31. Shah, S. S., Qureshi, F., Memon, F. A., & Uddin, M. H. (2024). Financial literacy and investment behaviour of individuals in Pakistan: Evidence from an Environment prone to religious sentiment. *Journal of Behavioural and Experimental Finance*, 44, 100974.
32. Song, C. L., Pan, D., Ayub, A., & Cai, B. (2023). The interplay between financial literacy, financial risk tolerance, and financial behaviour: The moderator effect of emotional intelligence. *Psychology Research and Behaviour Management*, 535-548.
33. Yeh, Y. H., Myerson, J., & Green, L. (2021). Delay discounting, cognitive ability, and personality: What matters?. *Psychonomic Bulletin & Review*, 28(2), 686-694.
34. Zhang, Y., Chen, Z. J., Lu, S., & Ni, S. (2021). Are mindful people more risk-averse? Effects of trait and state mindfulness on risk preference in decision-making. *International Journal of Psychology*, 56(3), 407-414.

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