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The Simultaneous Effects of Consumers' Cognitive Differences (Future Orientation, Holistic Thinking, Risk Perception, and Cognitive Flexibility) on Explaining Impulse Buying, Post-Purchase Cognitive Dissonance, and Price Sensitivity

ABSTRACT

Impulse buying, post-purchase cognitive dissonance, and price sensitivity are not uniform across consumers, and a substantial proportion of these differences can be attributed to individual cognitive differences. The present study aimed to simultaneously examine the effects of future orientation, holistic thinking, risk perception, and cognitive flexibility on these three behavioral outcomes using structural equation modeling. The analysis was conducted on a sample of 385 participants using 23 items rated on a five-point Likert scale. Confirmatory factor analysis indicated a satisfactory fit of the seven-factor measurement model ($\chi^2/df = 1.60$, CFI = .970, RMSEA = .039), and reliability as well as convergent and discriminant validity were confirmed. The results of the structural model indicated that future orientation, holistic thinking, and risk perception had negative effects on impulse buying; future orientation and holistic thinking reduced cognitive dissonance, whereas risk perception increased it; and future orientation and cognitive flexibility increased price sensitivity, whereas risk perception decreased it. Cognitive flexibility, which was itself influenced by future orientation and holistic thinking, partially mediated the relationship between future orientation and price sensitivity. The findings have implications for the design of advertising messages, perceived-risk reduction policies, and pricing strategies.

Keywords: future orientation, holistic thinking, risk perception, cognitive flexibility, impulse buying, cognitive dissonance, price sensitivity

Introduction

Consumer behavior is increasingly shaped by a complex interaction between cognitive characteristics, contextual cues, marketplace structures, and post-purchase evaluations. Contemporary consumers are exposed to dense streams of information, persuasive messages, social-media content, price comparisons, personalized recommendations, and increasingly sophisticated retail interfaces. Under such conditions, apparently similar purchasing situations may produce markedly different behavioral responses across individuals. Some consumers act quickly and spontaneously, whereas others deliberate and evaluate long-term implications; some experience substantial post-purchase doubt, whereas others remain psychologically consistent with their decisions; and some are highly responsive to price variations, whereas others prioritize non-price attributes. These variations suggest that consumer behavior cannot be fully explained through external marketing stimuli alone and that individual cognitive differences constitute an important explanatory layer. Recent consumer research has therefore increasingly emphasized psychological and experiential mechanisms underlying purchase decisions, repurchase

tendencies, customer citizenship behaviors, and behavioral reactions to marketing communications [1-4]. At the same time, systematic analyses of buying behavior indicate that consumer decision-making is multidimensional and requires models that incorporate cognitive, affective, experiential, and situational factors simultaneously rather than in isolation [5].

Among the most prominent outcomes of consumer decision-making is impulse buying. Impulse buying generally refers to relatively sudden, spontaneous, and insufficiently planned purchasing that occurs under the influence of immediate internal or environmental stimuli. The literature shows that impulse buying is not a marginal form of consumer behavior but a recurring feature of both offline and digital commerce. Research on social commerce has demonstrated that contextual interaction and exposure to influential social-media personalities can stimulate consumers' urge to buy spontaneously [6]. Likewise, online shopping experiences characterized by engaging interfaces, convenience, emotional stimulation, and platform-related cues can substantially increase impulsive purchasing [7]. More recent evidence among Generation Z consumers indicates that customer experiences and emotional responses on video-based commerce platforms are important determinants of impulse buying, reinforcing the view that spontaneous purchasing emerges through the interaction of environmental stimulation and individual processing tendencies [8]. Nevertheless, reviews of impulse-buying research suggest that the field remains theoretically fragmented, with considerable variation in conceptualization, measurement, and the psychological antecedents considered across studies [9, 10]. This fragmentation has generated calls for more integrated research examining how stable cognitive differences influence consumers' susceptibility to impulse purchasing.

Impulse buying should also be examined in relation to its psychological consequences. A spontaneous purchase may produce short-term pleasure or convenience but may subsequently create regret, uncertainty, conflict, or cognitive dissonance. Post-purchase cognitive dissonance occurs when consumers experience inconsistency between their expectations, beliefs, evaluations, or self-concept and the implications of a completed purchase. Such discomfort can lead consumers to question whether the selected product was appropriate, whether an alternative would have been superior, or whether the purchase itself should have been made. A recent review of the post-purchase effects of impulse buying indicates that impulsive consumption can have meaningful consequences for satisfaction, regret, product evaluation, and subsequent behavioral intentions [11]. These consequences are particularly important because consumer behavior does not terminate at the point of purchase; rather, post-purchase interpretation can influence future choice, loyalty, word of mouth, and repurchase. Research on repurchase intention similarly highlights the roles of perceived value, customer experience, and satisfaction in shaping consumers' subsequent decisions [2], while evidence concerning service fairness and dependence on aftermarket revenue suggests that perceptions formed after the initial transaction may directly affect willingness to repurchase [12]. Thus, post-purchase cognitive dissonance constitutes a psychologically meaningful outcome that should be studied alongside the purchase decision itself.

Price sensitivity represents another major consumer outcome. Consumers differ substantially in the degree to which price levels and price changes affect their evaluations and purchasing intentions. In competitive markets, price often functions not only as an economic sacrifice but also as an informational cue from which consumers infer value, quality, fairness, and risk. Studies conducted during periods of crisis have shown that price consciousness and value-oriented purchasing become particularly salient when consumers face resource constraints and uncertainty [13]. Retail research also demonstrates that the evolution of retail formats, digital channels, and information transparency has changed consumers' opportunities to compare prices and evaluate alternatives, potentially increasing the strategic importance of price sensitivity [14]. Yet

consumers do not interpret prices uniformly. In some contexts, higher prices may even be inferred as signals of higher quality, showing that price judgments may be motivationally and cognitively biased rather than purely economic [15]. Consequently, understanding price sensitivity requires attention to the cognitive mechanisms through which consumers process future consequences, uncertainty, contextual information, and alternative courses of action.

One potentially important cognitive determinant is future orientation. Future orientation reflects the extent to which individuals consider long-term consequences, project themselves forward in time, and incorporate future outcomes into present decisions. Consumers with stronger future orientation may be more capable of delaying immediate gratification, comparing short-term benefits with long-term costs, and resisting immediate purchasing urges. Research on time perspective has demonstrated that deviations from a balanced temporal orientation are systematically associated with a broad range of psychological characteristics and behavioral outcomes [16]. Similarly, studies of consideration of future consequences indicate meaningful links between demographic characteristics, future-oriented thinking, and problematic or compulsive buying tendencies [17]. Within consumer contexts, future time perspective may also interact with self-construal to alter impulsive buying tendencies, suggesting that temporal cognition can moderate the extent to which individuals respond to immediate consumption temptations [18]. Experimental research on mental time travel further indicates that the direction in which consumers mentally travel through time can alter perceived similarity between present and future selves and influence saving behavior [19]. These findings provide a theoretical basis for expecting future orientation to reduce impulse buying and post-purchase inconsistency while potentially increasing careful attention to price and value.

However, future-oriented behavior should not be equated with the simple absence of impulsivity. The concept of impulsivity itself has been critically reconsidered because it may combine multiple distinct mechanisms under a single broad label. Strickland and Johnson argued that treating impulsivity as a unitary psychological construct may obscure important theoretical, empirical, and sociocultural distinctions [20]. Related debates concerning self-control also caution against overly simplistic explanations based on depleted internal resources. Large-scale replication evidence has questioned the robustness of some traditional ego-depletion effects, suggesting that controlled behavior cannot always be reduced to a single limited-resource account [21]. In consumer behavior, this implies that spontaneous purchase decisions may be better understood through specific cognitive orientations, including future thinking, risk processing, flexibility, and holistic reasoning, rather than through generalized assumptions about weak self-control. Furthermore, judgment research has emphasized that human decisions are affected not only by systematic bias but also by unwanted variability or “noise,” highlighting the importance of identifying individual differences that contribute to inconsistent judgments across seemingly similar situations [22].

A second cognitive factor relevant to consumer behavior is holistic thinking. Holistic thinking involves attending to relationships among objects, contexts, and surrounding conditions rather than processing focal attributes independently. Consumers with a stronger holistic cognitive style may consider a wider range of contextual information when evaluating products, prices, and consequences. Research on individual differences in holistic-analytic thinking has shown that cognitive style influences responses to product incongruence and subsequent word-of-mouth behavior, demonstrating that holistic reasoning has direct relevance to consumer evaluation processes [23]. The broader cultural literature also indicates that patterns of cognition and behavior are embedded in historically developed social environments. For example, regional differences associated with rice-farming traditions have been linked to tighter social norms, supporting the view that cognition and behavioral regulation are partly shaped by socioecological context [24]. In a purchasing environment, holistic

thinkers may be more likely to integrate product characteristics, social context, future implications, and alternative options before acting. This broader cognitive integration may reduce susceptibility to impulse buying and decrease subsequent dissonance because the original decision is made with a more comprehensive representation of its relevant consequences.

Risk perception represents another central cognitive mechanism in consumer decision-making. Purchases frequently involve uncertainty concerning product performance, financial value, social consequences, safety, service quality, or future satisfaction. Consumers who perceive higher risk may become more cautious, defer purchases, seek additional information, or avoid spontaneous decisions. However, heightened risk perception may also produce greater uncertainty after the transaction has occurred, thereby increasing post-purchase cognitive dissonance. The importance of risk-related psychological processes is particularly evident in domains involving complex or value-laden consumer decisions. Research on green cosmetics, for example, demonstrates that psychological drivers meaningfully influence prosocial and citizenship-oriented buying behavior [1]. In digital and social-media environments, purchase decisions are also shaped by how consumers interpret marketing information and translate customer experience into behavioral intentions [3]. Similarly, research on sentiment in product descriptions indicates that the way product information is framed can influence purchase intention, implying that consumers' interpretation of information can alter perceived uncertainty and desirability [4]. Accordingly, risk perception is unlikely to exert a uniform effect across all consumer outcomes; it may suppress impulse purchasing while simultaneously increasing cognitive conflict after purchase and altering consumers' sensitivity to price.

Cognitive flexibility may provide an additional explanatory mechanism linking broader cognitive orientations to behavioral outcomes. Cognitive flexibility refers to the capacity to adapt thoughts and behavioral strategies in response to changing demands, alternative information, or shifting environmental conditions. It encompasses the ability to disengage from ineffective perspectives, consider alternative interpretations, and adjust responses when circumstances change. Contemporary neuroscience conceptualizes cognitive and behavioral flexibility as fundamental adaptive capacities supported by multiple neural systems and relevant across both normative and clinical functioning [25]. Measurement research similarly shows that cognitive flexibility is a multidimensional construct that can be assessed through neuropsychological tasks, self-report instruments, and neuroscientific methods, with each approach capturing somewhat different aspects of adaptive cognition [26]. From a consumer perspective, cognitively flexible individuals may be better able to shift between immediate desire and deliberative evaluation, reconsider alternatives, update judgments when price or risk information changes, and adapt their purchasing strategy to contextual demands. Cognitive flexibility may therefore function not only as a direct predictor of consumer outcomes but also as a mediator through which future orientation or holistic thinking affects price-related decisions.

The interaction among these constructs is theoretically important because consumer cognition is unlikely to operate through isolated pathways. A future-oriented consumer may be better able to generate alternative future scenarios, thereby increasing cognitive flexibility. Similarly, holistic thinkers may naturally attend to multiple contextual relationships and alternative interpretations, which may facilitate flexible cognition. Cognitive flexibility, in turn, could increase responsiveness to price information by allowing consumers to reconsider alternatives, switch brands, delay purchases, or revise their evaluation of value when market conditions change. These processes may be particularly relevant in contemporary retail settings where consumers are exposed to multiple formats, rapid comparison tools, personalized offers, and diverse digital touchpoints [14]. Moreover, current reviews of business purchasing and customer-service value suggest that decision

processes increasingly involve integrated evaluation across multiple dimensions rather than isolated responses to a single product attribute [5]. Accordingly, modeling cognitive flexibility as a mediator can provide a more precise explanation of how relatively broad cognitive orientations translate into observable marketplace behaviors.

The simultaneous consideration of impulse buying, post-purchase cognitive dissonance, and price sensitivity also addresses an important conceptual gap. These outcomes represent different stages or dimensions of the consumer decision process: impulse buying concerns the immediacy and planning of the purchase; cognitive dissonance reflects post-purchase psychological evaluation; and price sensitivity reflects the weight assigned to economic sacrifice and price differences. Previous studies have often investigated these phenomena separately, even though they may arise from shared cognitive antecedents. Reviews of impulse buying repeatedly call for broader frameworks capable of integrating antecedents, mechanisms, and consequences [9, 10], while post-purchase research emphasizes the need to examine what occurs after an impulsive transaction rather than treating the purchase as the final outcome [11]. Integrating these outcomes in one model therefore allows the same cognitive characteristic to be examined across distinct but related forms of consumer behavior.

Such integration is also methodologically relevant. When multiple latent cognitive constructs and behavioral outcomes are examined simultaneously, structural equation modeling offers advantages because it enables researchers to estimate the measurement properties of latent constructs, account for measurement error, and test multiple direct and indirect relationships within a unified model. Appropriate assessment of measurement quality is essential because apparent relationships among constructs can be misleading when reliability, convergent validity, or discriminant validity is inadequate. Contemporary guidelines emphasize rigorous assessment of discriminant validity when conceptually related constructs are included in the same model [27]. Likewise, structural equation modeling requires careful consideration of model specification, fit indices, parameter estimation, and theoretically justified comparisons among alternative models [28]. These methodological principles are particularly important when investigating constructs such as future orientation, holistic thinking, risk perception, and cognitive flexibility because conceptual overlap among cognitive variables must be distinguished from genuine empirical relationships.

Overall, existing research provides strong evidence that consumer decisions are influenced by future-oriented cognition, cognitive style, risk evaluation, adaptive flexibility, price-related judgments, and environmental stimulation, yet these streams of research remain insufficiently integrated. Future orientation has been linked to saving, consideration of future consequences, and impulsive tendencies [17-19]; holistic cognition has been associated with contextualized consumer judgments [23]; cognitive flexibility is recognized as an important adaptive capacity [25, 26]; and consumer responsiveness to price is shaped by value perceptions, economic conditions, and inferential processes [13, 15]. At the same time, research on digital commerce confirms that consumer experiences and persuasive environments can intensify spontaneous purchasing [6-8]. These findings collectively support the development of an integrated cognitive model capable of clarifying why consumers exposed to similar marketplace stimuli nevertheless display different levels of impulsive purchasing, post-purchase dissonance, and price sensitivity.

Accordingly, the aim of the present study was to simultaneously examine the effects of future orientation, holistic thinking, risk perception, and cognitive flexibility on impulse buying, post-purchase cognitive dissonance, and price sensitivity, while also evaluating the mediating role of cognitive flexibility within a structural equation modeling framework.

Methodology

The present study was applied in terms of purpose, descriptive-correlational in nature, and cross-sectional in terms of time. Data were collected from 385 participants using a standardized questionnaire. Participants were selected through convenience sampling based on ease of access, availability, and willingness to participate. To include consumers with different demographic characteristics, the researcher collected data by visiting numerous public and private locations, including shopping centers, cafés, restaurants, parks, and universities, across different areas of Urmia. Before data collection, participants were informed about the purpose of the study, and no incentives were provided. The demographic characteristics of the sample are presented in Table 1.

Table 1

Demographic Characteristics of the Sample

Characteristic	Group	Frequency	Percentage
Gender	Male	222	57.7
	Female	163	42.3
Age (years)	18–22	135	35.1
	23–44	149	38.7
	45 and older	101	26.2
Education	Primary and middle school	5	1.3
	High school	75	19.5
	University education	256	66.5
	Postgraduate education	49	12.7
Personal income	Low	149	38.7
	Moderate	153	39.7
	High	83	21.6

All constructs were measured using established scales on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree): future orientation (four items) adapted from Strathman et al. (1994) and Kooij et al. (2018); holistic thinking (two items) from Choi et al. (2003) and Allman et al. (2019); risk perception (five items) from Laroche et al. (2005) and Marriott and Williams (2018); cognitive flexibility (two items) from Martin and Rubin (1995) and Uddin (2021); impulse buying (four items) from Rook and Fisher (1995) and Zafar et al. (2021); post-purchase cognitive dissonance (three items) from Sweeney et al. (2000) and Vaidis and Byrne (2019); and price sensitivity (three items) from Lichtenstein et al. (1993) and Gauri et al. (2021). A total of 23 items were used.

The analyses were conducted using maximum likelihood estimation based on the item covariance matrix. Normality was assessed using univariate skewness and kurtosis and Mardia's coefficient (Hair et al., 2022; Mishra et al., 2019), while homogeneity of variances was assessed using Levene's test (Kim & Park, 2019). The measurement model was evaluated using confirmatory factor analysis (CFA). Reliability was assessed using Cronbach's alpha, composite reliability (CR), and maximal reliability H; convergent validity was evaluated using average variance extracted (AVE); and discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT) (Franke & Sarstedt, 2019). Model fit was evaluated using χ^2/df, CFI, TLI, IFI, GFI, AGFI, NFI, RFI, RMSEA, and SRMR (Hair et al., 2019; Kline, 2023; Xia & Yang, 2019). The hypotheses were tested using the structural model, and indirect effects were examined using bootstrapping (Hayes, 2018; Memon et al., 2018). Although the data were ordinal, because the items had five response categories and exhibited only slight skewness, they could reasonably be treated as continuous variables (Rhemtulla, 2020).

Findings and Results

There were no missing data. The skewness and kurtosis values for all items were within acceptable ranges (absolute skewness < 2 and kurtosis < 7) (Hair et al., 2019; Mishra et al., 2019). Mardia's coefficient was 566.3 (expected value = 575; Z = −2.53), and no multivariate outliers were identified (Mahalanobis distance > 49.7: 0 cases). Multivariate kurtosis was slightly below the normality threshold, indicating a somewhat flatter distribution, which was not problematic for ML estimation. Descriptive statistics for the constructs are presented in Table 2.

Table 2

Descriptive Statistics for Composite Scores (Item Means) and Cronbach's Alpha

Construct	Mean	SD	Skewness	Kurtosis	Cronbach's α
Future orientation	3.72	0.81	−0.38	−0.49	.834
Holistic thinking	3.76	0.83	−0.26	−0.47	.802
Risk perception	3.35	0.86	−0.14	−0.49	.868
Cognitive flexibility	3.93	0.81	−0.71	0.49	.687
Price sensitivity	3.48	0.91	−0.26	−0.47	.856
Cognitive dissonance	2.65	1.03	0.24	−0.70	.886
Impulse buying	2.82	0.93	0.08	−0.74	.871

The results of Levene's test (Table 3) indicated that the assumption of homogeneity of variances was satisfied for all constructs across education and income groups, for six constructs across gender groups (with the exception of risk perception), and for six constructs across age groups (with the exception of impulse buying). The two significant cases (p < .05) were limited and minor and, considering the relative group sizes, did not preclude further analysis.

Table 3

Significance Levels of Levene's Test Across Demographic Groups

Grouping Variable	Future Orientation	Holistic Thinking	Risk Perception	Cognitive Flexibility	Price Sensitivity	Cognitive Dissonance	Impulse Buying
Gender	.336	.379	.048	.539	.798	.689	.364
Age	.612	.308	.454	.744	.552	.991	.013
Education	.331	.935	.432	.673	.579	.621	.194
Income	.756	.265	.762	.599	.455	.240	.410

The overall fit of the seven-factor model comprising 23 items was satisfactory: $\chi^2 = 333.74$, $df = 209$, $p < .001$, and $\chi^2/df = 1.60$, which is below the commonly recommended thresholds of 2 and 3. The remaining fit indices were CFI = .970, TLI = .964, IFI = .970, GFI = .934, AGFI = .912, NFI = .924, RFI = .908, RMSEA = .039 (90% CI [.031, .047]), and SRMR = .026. Comparison of the seven-factor model with competing models further confirmed its superiority (Table 4).

Table 4

Fit Indices for the Measurement Model and Competing Models

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
Seven-factor model (proposed model)	333.7	209	1.60	.970	.964	.039	.026
Six-factor model (risk perception and dissonance combined)	847.0	215	3.94	.848	.821	.087	.060
Five-factor model (two pairs of factors combined)	1262.1	220	5.74	.749	.712	.111	.080
One-factor model	3220.1	230	14.00	.280	.208	.184	.183
Acceptance threshold	—	—	< 3	> .90	> .90	< .08	< .08

The standardized factor loadings of all items exceeded the minimum threshold of .50 and were significant at the 95% confidence level (p < .05), providing evidence of convergent validity (Hair et al., 2019; Ronkko & Cho, 2022) (Table 5). Cronbach's alpha values for all constructs except cognitive flexibility were substantially above .70; the alpha coefficient for

this two-item construct was .687. Because alpha is sensitive to scale length, values above .60 are generally considered acceptable for short scales (Hayes & Coutts, 2020; McNeish, 2018; Taber, 2018).

Table 5

Item Factor Loadings for the Seven-Factor Measurement Model

Construct	Item	Standardized Loading	Unstandardized Estimate	SE	t	p	Mean	SD
Future orientation	FO1	.636	Fixed (1)	—	—	—	3.62	1.01
	FO2	.718	1.141	.100	11.44	< .001	3.58	1.02
	FO3	.788	1.207	.099	12.21	< .001	3.85	0.98
	FO4	.850	1.315	.104	12.68	< .001	3.83	0.99
Holistic thinking	HT1	.730	Fixed (1)	—	—	—	3.76	0.89
	HT2	.917	1.324	.211	6.29	< .001	3.77	0.94
Risk perception	RP1	.688	Fixed (1)	—	—	—	3.41	1.07
	RP2	.722	1.006	.080	12.61	< .001	3.27	1.03
	RP3	.754	1.057	.081	13.10	< .001	3.42	1.03
	RP4	.782	1.112	.082	13.51	< .001	3.43	1.05
	RP5	.820	1.230	.088	14.04	< .001	3.23	1.11
Cognitive flexibility	CF1	.841	Fixed (1)	—	—	—	3.88	0.91
	CF2	.623	.762	.152	5.02	< .001	3.97	0.94
Price sensitivity	PC1	.756	Fixed (1)	—	—	—	3.50	1.03
	PC2	.820	1.101	.071	15.55	< .001	3.50	1.04
	PC3	.874	1.164	.073	16.01	< .001	3.45	1.03
Cognitive dissonance	CD1	.752	Fixed (1)	—	—	—	2.52	1.13
	CD2	.869	1.158	.066	17.55	< .001	2.62	1.14
	CD3	.931	1.247	.069	18.15	< .001	2.82	1.14
Impulse buying	BI1	.663	Fixed (1)	—	—	—	2.76	1.06
	BI2	.759	1.148	.089	12.93	< .001	2.66	1.07
	BI3	.849	1.342	.095	14.10	< .001	2.91	1.11
	BI4	.897	1.420	.098	14.52	< .001	2.94	1.12

For further evaluation, CR, AVE, MSV, and maximal reliability (H) were calculated (Table 6). According to the recommended criteria, CR should exceed .70, or at minimum .60; AVE should exceed .50; and CR should be greater than AVE (Hair et al., 2019; Ronkko & Cho, 2022). For discriminant validity, MSV should be lower than AVE, and the square root of AVE should exceed the correlations between constructs. All of these conditions were satisfied. Moreover, H exceeded .75 for all constructs and was greater than .80 for six constructs (Flora, 2020).

Table 6

Reliability, Validity, and Interconstruct Correlations (Square Root of AVE on the Diagonal)

	CR	AVE	MSV	MaxR(H)	PC	HT	CF	FO	BI	CD	RP
PC	.858	.669	.205	.869	.818						
HT	.813	.687	.089	.865	.157	.829					
CF	.703	.547	.089	.753	.267	.298	.740				
FO	.838	.566	.205	.857	.453	.100	.192	.752			
BI	.873	.635	.094	.898	−.189	−.170	−.132	−.306	.797		
CD	.889	.729	.267	.916	−.222	−.127	−.103	−.203	.024	.854	
RP	.868	.569	.267	.874	−.175	.059	−.003	−.083	−.106	.516	.754

Note. PC = price sensitivity; HT = holistic thinking; CF = cognitive flexibility; FO = future orientation; BI = impulse buying; CD = cognitive dissonance; RP = risk perception.

Discriminant validity was also assessed using the HTMT criterion (Table 7). The highest HTMT value was .520, which is below the .85 threshold (Franke & Sarstedt, 2019); therefore, the constructs were empirically distinct from one another.

Table 7

HTMT Matrix

	PC	HT	CF	FO	BI	CD
HT	.173					
CF	.266	.319				
FO	.456	.108	.200			
BI	.188	.150	.125	.306		
CD	.230	.105	.094	.188	.052	
RP	.172	.072	.050	.067	.108	.520

The structural model fit indices (Table 8) indicate that the overall fit of the proposed model was acceptable.

Table 8

Structural Model Fit Indices

Index	Value	Threshold	Index	Value
χ^2 (df)	338.08 (216)	—	CFI	.971
χ^2/df	1.57	< 3	TLI	.966
GFI	.933	> .90	IFI	.971
AGFI	.914	> .85	NFI	.923
RMSEA	.038 (.030–.046)	< .08	RFI	.910
SRMR	.029	< .08	PNFI	.788

Table 9 presents the standardized and unstandardized path coefficients and the results of the hypothesis tests, while Figure 2 presents the estimated structural model. Future orientation had significant effects on impulse buying (H1: β = −.31), cognitive dissonance (H2: β = −.15), price sensitivity (H3: β = .41), and cognitive flexibility (H4: β = .17). The effect of cognitive flexibility on price sensitivity was also positive and significant (H5: β = .19). Holistic thinking reduced impulse buying (H6: β = −.13) and cognitive dissonance (H7: β = −.14) and increased cognitive flexibility (H8: β = .29). Risk perception had negative effects on impulse buying (H9: β = −.12) and price sensitivity (H11: β = −.14) and a positive effect on cognitive dissonance (H10: β = .51). Therefore, all 11 hypotheses were supported.

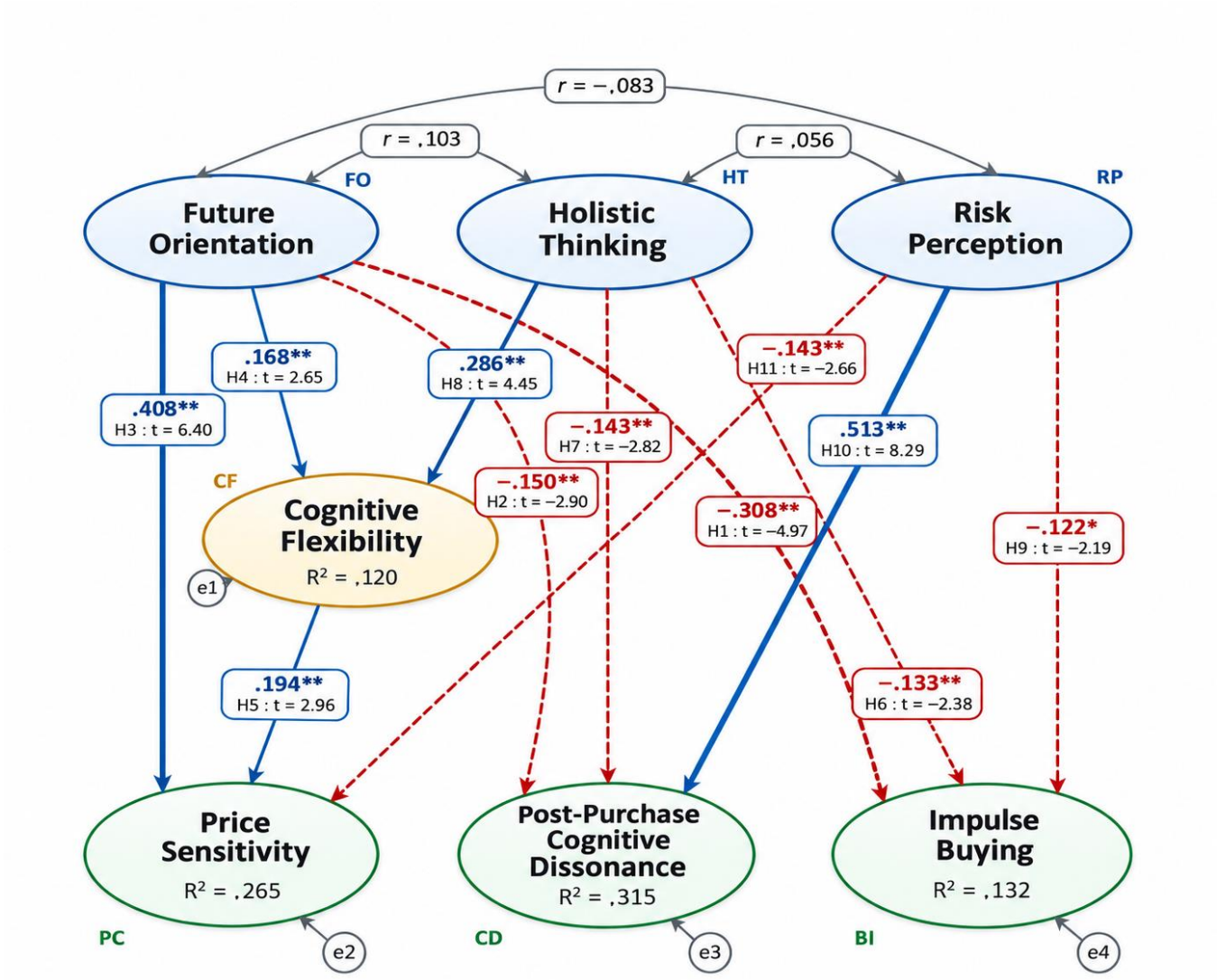
Table 9

Path Parameter Estimates and Hypothesis Testing

Path	Hypothesis	Standardized β	Unstandardized B	SE	t	p	Result
Future orientation ← Impulse buying	1	−.308	−.339	.068	−4.97	< .001	Supported
Future orientation ← Cognitive dissonance	2	−.150	−.201	.069	−2.90	.004	Supported
Future orientation ← Price sensitivity	3	.408	.495	.077	6.40	< .001	Supported
Future orientation ← Cognitive flexibility	4	.168	.198	.075	2.65	.008	Supported
Cognitive flexibility ← Price sensitivity	5	.194	.199	.067	2.96	.003	Supported
Holistic thinking ← Impulse buying	6	−.133	−.147	.062	−2.38	.017	Supported
Holistic thinking ← Cognitive dissonance	7	−.143	−.191	.068	−2.82	.005	Supported
Holistic thinking ← Cognitive flexibility	8	.286	.338	.076	4.45	< .001	Supported
Risk perception ← Impulse buying	9	−.122	−.117	.053	−2.19	.028	Supported
Risk perception ← Cognitive dissonance	10	.513	.593	.072	8.29	< .001	Supported
Risk perception ← Price sensitivity	11	−.143	−.150	.056	−2.66	.008	Supported

Figure 1

Estimated structural equation model (standardized coefficients)



The coefficient of determination (R^2) was .120 for cognitive flexibility, .265 for price sensitivity, .315 for cognitive dissonance, and .132 for impulse buying. Thus, the model explained approximately 13% of the variance in impulse buying, 31% of the variance in cognitive dissonance, and 26% of the variance in price sensitivity.

The mediating role of cognitive flexibility was tested using bootstrapping. The standardized indirect effect of future orientation on price sensitivity through cognitive flexibility was .032 (95% CI [.005, .068]). Because zero was not included in the confidence interval, the indirect effect was significant. The direct effect also remained significant; therefore, partial mediation was established (Hayes, 2018; Memon et al., 2018). The indirect effect of holistic thinking on price sensitivity through the same pathway was .055 (95% CI [.014, .107]), indicating full mediation, that is, an indirect-only effect (Table 10).

Table 10

Direct, Indirect, and Total Effects on Price Sensitivity (Standardized Coefficients)

Path	Direct Effect	Indirect Effect	Total Effect	Bootstrap Confidence Interval for Indirect Effect
Future orientation ← Cognitive flexibility ← Price sensitivity	.408	.032	.440	[.005, .068]
Holistic thinking ← Cognitive flexibility ← Price sensitivity	—	.055	.055	[.014, .107]

Discussion and Conclusion

The present study examined the simultaneous effects of future orientation, holistic thinking, risk perception, and cognitive flexibility on impulse buying, post-purchase cognitive dissonance, and price sensitivity, while also evaluating the mediating role of cognitive flexibility. The structural model demonstrated satisfactory fit, and all eleven hypothesized paths were statistically significant. Specifically, future orientation had a negative effect on impulse buying and post-purchase cognitive dissonance and a positive effect on price sensitivity and cognitive flexibility. Holistic thinking negatively predicted impulse buying and post-purchase cognitive dissonance while positively predicting cognitive flexibility. Risk perception negatively affected impulse buying and price sensitivity but positively affected post-purchase cognitive dissonance. Cognitive flexibility, in turn, positively predicted price sensitivity. In addition, cognitive flexibility partially mediated the relationship between future orientation and price sensitivity and fully mediated the relationship between holistic thinking and price sensitivity. The model explained 13.2% of the variance in impulse buying, 31.5% in post-purchase cognitive dissonance, 26.5% in price sensitivity, and 12.0% in cognitive flexibility, indicating that cognitive differences make a meaningful contribution to explaining heterogeneous consumer responses.

The negative effect of future orientation on impulse buying is theoretically consistent with the proposition that individuals who pay greater attention to delayed consequences are less likely to prioritize immediate gratification. Consumers with stronger future orientation are more likely to consider downstream financial and psychological consequences before making a purchase and therefore may be less susceptible to spontaneous buying impulses. This result is consistent with evidence linking consideration of future consequences to lower problematic or compulsive purchasing tendencies [17]. It is also aligned with research indicating that future time perspective can alter impulsive buying tendencies and moderate the effects of self-related cognitive processes on immediate consumption decisions [18]. More broadly, balanced temporal orientation has been associated with adaptive psychological functioning and more regulated behavior, whereas temporal imbalance may increase vulnerability to short-term decision biases [16]. The present result therefore suggests that future orientation operates as a protective cognitive mechanism against impulsive consumption by increasing the psychological salience of delayed consequences.

This finding also adds nuance to the contemporary impulse-buying literature. Previous research has shown that impulsive purchases are shaped by environmental and experiential factors, including social-media interaction, platform design, customer experience, and emotional activation [6-8]. The current findings suggest that these external triggers do not operate uniformly across consumers because susceptibility to them is partly conditioned by future-oriented cognition. This interpretation is compatible with systematic reviews showing that impulse buying is a multifactorial phenomenon with cognitive, affective, situational, and contextual antecedents [9, 10]. It also supports the argument that impulsive behavior should not be reduced to a simple deficit in self-control or treated as a single psychological construct [20]. Instead, specific cognitive differences such as temporal orientation may help explain why consumers exposed to similar stimuli respond differently.

Future orientation also had a significant negative effect on post-purchase cognitive dissonance. Consumers who think prospectively may engage in more extensive pre-purchase evaluation, anticipate possible outcomes, and incorporate future consequences into their decision processes. As a result, their final choices may be more internally coherent and less likely to produce post-purchase uncertainty. This interpretation is consistent with research showing that mental time travel influences

the perceived relationship between the present and future self and affects economically consequential decisions such as saving [19]. By mentally representing future outcomes before acting, consumers may reduce the discrepancy between anticipated and realized consequences. This is particularly relevant given evidence that impulse buying can generate regret, dissatisfaction, and other adverse post-purchase outcomes [11]. Thus, future-oriented cognition may reduce post-purchase dissonance partly because it improves the quality and temporal consistency of pre-purchase judgment.

The positive effect of future orientation on price sensitivity further indicates that future-oriented consumers pay greater attention to the economic consequences of current purchases. Rather than interpreting price solely as an immediate transaction characteristic, they may evaluate its implications for future resources, alternative opportunities, and long-term financial utility. This result is compatible with studies showing that price consciousness and value-oriented purchasing become especially salient when consumers are attentive to economic constraints and future purchasing capacity [13]. It is also consistent with research demonstrating that consumers use price as a cognitively meaningful signal rather than merely a cost variable [15]. In retail environments where consumers have access to extensive price comparison and alternative offerings, future-oriented cognition may increase the tendency to compare options, delay purchase, or seek economically superior alternatives [14].

Future orientation also positively predicted cognitive flexibility. This result suggests that prospective thinking may facilitate the ability to consider alternative courses of action, adjust current behavior in light of future possibilities, and shift between immediate and delayed frames of reference. Cognitive flexibility is fundamentally associated with adaptive switching among perspectives, goals, and behavioral responses [25], and contemporary measurement research similarly conceptualizes it as the capacity to update or reorganize cognition when situational demands change [26]. A consumer who habitually considers future consequences may therefore be more likely to generate alternative scenarios and reconsider a current purchase when new price, risk, or product information becomes available.

Holistic thinking also reduced impulse buying. Holistic thinkers tend to process information relationally and contextually rather than focusing exclusively on the most salient immediate cue. In a purchasing context, this style may encourage consumers to integrate product attributes, price, social context, alternative options, and potential consequences into a broader decision representation. This interpretation is compatible with evidence showing that holistic-analytic cognitive style shapes responses to product incongruence and influences consumer communication behavior [23]. The result may also be understood within a broader sociocultural framework in which contextual sensitivity and interconnected cognition vary across social ecologies [24]. When consumers are more attentive to relationships among multiple elements of a purchasing situation, immediate stimulus-driven responses may become less dominant, thereby reducing impulsive purchasing.

Holistic thinking also had a negative effect on post-purchase cognitive dissonance. A plausible explanation is that holistic consumers evaluate decisions within a wider contextual framework before committing to them, which may reduce the likelihood that important information is ignored during the decision process. Because post-purchase dissonance often arises from perceived inconsistencies, overlooked alternatives, or concerns about whether another option would have been preferable, a more integrative evaluation process may reduce the probability of such conflict after purchase. This interpretation is consistent with research showing that consumers' responses to products depend on how they cognitively integrate congruent and incongruent information [23]. It also complements research emphasizing that customer experience

and perceived value influence post-purchase outcomes and repurchase tendencies [2, 12]. Holistic cognition may therefore support more coherent evaluations across the pre-purchase and post-purchase stages.

The positive effect of holistic thinking on cognitive flexibility provides an additional explanation for these outcomes. Holistic thinking requires attention to multiple relationships and contextual contingencies, whereas cognitive flexibility involves shifting among perspectives and adapting to changing conditions. These constructs are conceptually distinct, but the present findings indicate that they are functionally related. Consumers who habitually process information in an interconnected manner may also find it easier to revise judgments, consider alternative interpretations, and switch decision strategies when circumstances change. This pattern is compatible with contemporary conceptualizations of cognitive flexibility as a capacity for adaptive reconfiguration of thought and behavior [25, 26].

Risk perception had a negative effect on impulse buying, which is consistent with the notion that perceived uncertainty inhibits spontaneous action. When consumers anticipate possible financial, functional, social, or performance-related losses, they are more likely to engage in information search and deliberation rather than immediate purchase. In digital environments, consumers are often exposed to persuasive content designed to reduce uncertainty and increase purchase intention, and research has shown that both social-media marketing and the emotional framing of product information can influence purchase decisions [3, 4]. The current findings indicate that consumers who nevertheless maintain a high level of perceived risk are less likely to respond impulsively. This is also compatible with psychological accounts of consumer choice emphasizing that buying behavior reflects the interaction of personal drivers and situational information rather than external stimuli alone [1].

In contrast, risk perception had a strong positive effect on post-purchase cognitive dissonance, and this was the largest standardized path in the model. This result indicates that consumers who perceive greater risk may continue to experience uncertainty after the transaction has been completed. High-risk perceptions can amplify doubts about product quality, the appropriateness of the selected alternative, or the possibility of having made a costly mistake. This interpretation fits well with evidence that post-purchase consequences of impulsive or uncertain decisions can include regret, dissatisfaction, and negative self-evaluation [11]. It also corresponds to research showing that consumers frequently make motivated inferences about price and quality when information is uncertain, potentially increasing ambiguity rather than resolving it [15]. Thus, risk perception appears to have a dual role: it suppresses immediate impulsive behavior before purchase while increasing psychological conflict after purchase when uncertainty remains unresolved.

The negative effect of risk perception on price sensitivity may initially appear counterintuitive because higher perceived risk might be expected to intensify attention to price. However, when perceived risk becomes salient, consumers may shift attention from minimizing price to reducing uncertainty. In such cases, reliability, quality, familiarity, warranty, service, or brand reputation may become more important than obtaining the lowest price. Consumers may therefore accept a higher price in exchange for perceived risk reduction. This interpretation is consistent with evidence that price can serve as a quality cue and that consumers sometimes infer higher quality from higher prices under uncertainty [15]. It is also consistent with the broader evolution of retail markets in which price competes with convenience, trust, experience, and service as a basis for consumer choice [5, 14]. Accordingly, higher perceived risk may reduce conventional price sensitivity because consumers prioritize uncertainty reduction over economic savings.

Cognitive flexibility positively predicted price sensitivity. Flexible consumers may be more willing to reconsider alternatives, compare prices across sellers, change brands, postpone purchases, or adopt a different purchasing strategy when a better-value option becomes available. Rather than remaining committed to one option, they can update their decision in response to new information. This interpretation is directly compatible with the adaptive nature of cognitive flexibility described in the psychological and neuroscientific literature [25, 26]. It also corresponds to retail conditions characterized by high information availability and rapid comparison opportunities [14]. Therefore, cognitive flexibility may make consumers more responsive to price differences because they are less cognitively constrained by their initial choice or preferred alternative.

The mediation results extend these direct effects. Cognitive flexibility partially mediated the association between future orientation and price sensitivity. This indicates that future orientation influences price sensitivity both directly and indirectly through greater cognitive flexibility. Future-oriented consumers may pay more attention to the long-term economic consequences of purchases, while simultaneously being more willing to revise their choices when more favorable alternatives become available. In contrast, cognitive flexibility fully mediated the relationship between holistic thinking and price sensitivity. This implies that holistic thinking did not directly produce greater price sensitivity; rather, its effect operated through the consumer's enhanced ability to adapt, compare, and shift among options. These findings contribute to an integrated cognitive explanation of price-related behavior by showing that broad cognitive orientations may affect consumer outcomes through more proximal adaptive mechanisms.

The explanatory power of the model was strongest for post-purchase cognitive dissonance and price sensitivity and more modest for impulse buying and cognitive flexibility. This pattern is reasonable because impulse buying is particularly sensitive to situational and affective triggers that were not included in the current model. Prior studies have demonstrated that emotional reactions, social-media content, platform features, and online shopping experience can substantially influence impulse buying [6-8]. Moreover, variability in judgment may arise not only from stable traits but also from situational noise and context-dependent fluctuations [22]. The relatively modest explained variance in impulse buying therefore reinforces the multidetermined nature of this behavior. Similarly, findings from self-control research caution against assuming that behavior can be explained by a single resource or mechanism [21]. The present model should consequently be viewed as identifying a meaningful cognitive component of consumer behavior rather than offering an exhaustive explanation.

Overall, the results support an integrated view in which future orientation, holistic thinking, risk perception, and cognitive flexibility jointly shape consumer decisions before, during, and after purchase. They also demonstrate the value of examining multiple behavioral outcomes within the same structural framework rather than studying impulse buying, post-purchase dissonance, and price sensitivity independently. The satisfactory measurement and structural fit of the model further supports the empirical distinctiveness of the included constructs, consistent with contemporary recommendations for careful evaluation of discriminant validity and latent-variable modeling [27, 28]. Taken together, the findings indicate that consumer responses to the same marketplace environment depend substantially on how individuals represent future consequences, process contextual relationships, perceive uncertainty, and adapt their thinking when alternatives or circumstances change.

The present study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design does not permit definitive causal conclusions, even though the structural model was theoretically specified in directional terms. Second, convenience sampling from public and private locations in one urban setting may limit the

generalizability of the findings to consumers from other geographical, cultural, socioeconomic, and retail contexts. Third, all variables were measured through self-report questionnaires, which may introduce common-method variance, socially desirable responding, or discrepancies between reported tendencies and actual purchasing behavior. Fourth, several constructs, particularly cognitive flexibility and holistic thinking, were represented by relatively short scales, which may restrict the breadth of construct coverage despite acceptable measurement properties. Fifth, the study focused primarily on cognitive predictors and did not simultaneously include affective states, personality traits, situational pressures, product categories, digital-platform characteristics, or marketing stimuli that may also influence impulse buying, dissonance, and price sensitivity. Finally, the use of a single-time assessment prevented examination of how cognitive processes and post-purchase reactions evolve over time.

Future studies should employ longitudinal, experimental, and experience-sampling designs to clarify temporal and causal relationships among the variables examined in this study. Replication across different countries, cultures, age groups, income levels, and product categories would help determine whether the structural relationships are stable across consumer segments and market environments. Researchers could also compare online and offline purchasing contexts and investigate whether digital features such as personalization, social proof, limited-time offers, recommendation systems, and dynamic pricing moderate the identified relationships. Future models should incorporate additional cognitive and affective mechanisms, including regret, anticipated regret, self-control, emotional arousal, uncertainty tolerance, financial literacy, decision fatigue, perceived scarcity, and value consciousness. Behavioral data such as actual spending, clickstream information, purchase frequency, and response to experimentally manipulated prices would strengthen external validity. Further work could also examine alternative mediation and moderation structures, including whether cognitive flexibility moderates rather than mediates responses to risk or whether future orientation buffers the effect of emotionally intense marketing stimuli on impulse buying.

The findings have several implications for retailers, advertisers, platform designers, and pricing managers. Marketing strategies should be adapted to consumers' cognitive profiles rather than assuming uniform responsiveness to promotional stimuli. Consumers with stronger future orientation may respond more effectively to messages emphasizing long-term value, durability, cost savings, and future benefits, whereas highly holistic consumers may prefer messages that present products within a broader lifestyle or contextual framework. Because perceived risk suppresses impulse buying but intensifies post-purchase dissonance, firms should reduce uncertainty through clear product information, transparent return policies, warranties, credible reviews, demonstrations, and responsive after-sales service. At the same time, managers should recognize that highly risk-sensitive consumers may accept higher prices when these prices are accompanied by credible quality and risk-reduction signals. Pricing interfaces can also support cognitively flexible consumers by making comparisons, alternatives, bundles, and value differences transparent. Finally, post-purchase communication should be designed to reinforce decision confidence, reduce uncertainty, and remind consumers of the value and suitability of their purchases, particularly in product categories characterized by high perceived risk.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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