Proceedings of Engineering and Technology Innovation, vol. 33, 2026, pp. 120-131

Consumer Behavior toward Near-Expired Convenience Store Meals: An Empirical Investigation Based on Value-Attitude-Behavior Model

Chun-Hua Hsiao[1], Chien-Hung Lin[2,*], Yu-En Lai[1], Cheng-Ping Chen[3], Kai-Yu Tang[4]

[1]School of Business, Kainan University, Taoyuan, Taiwan, ROC

[2]Department of International Business, Kainan University, Taoyuan, Taiwan, ROC

[3]Department of Marketing and Logistics Management, Vanung University, Taoyuan, Taiwan, ROC

[4]Graduate Institute of Library & Information Science; Innovation and Development Center of Sustainable Agriculture, National Chung Hsing University, Taichung, Taiwan, ROC

Received 09 December 2025; revised 07 April 2026; accepted 08 April 2026

DOI: https://doi.org/10.46604/peti.2026.15959

Abstract

Convenience stores in Taiwan discard over 500 metric tons of food each month, with 80% of it being near-expired. Despite this significant waste, consumer-perspective research addressing the issue remains limited. This study aims to investigate consumer behavior toward near-expired convenience store meals using the value-attitude-behavior (VAB) model. It examines how consumer values (altruism, app convenience, and monetary savings) influence emotional and rational attitudes, which in turn affect intentions to purchase meals, download related applications, and reduce food waste. Based on 222 valid online survey responses, the results indicate that altruistic and monetary values enhance both emotional and rational attitudes, whereas app convenience value primarily strengthens rational attitudes. Emotional attitudes significantly influence intentions to purchase meals, download the app, and reduce food waste, while rational attitudes primarily encourage app downloads and willingness to reduce food waste. Implications for advancing sustainable food waste education are also provided.

Keywords: value-attitude-behavior model, surplus food, convenience store, mobile apps, food waste

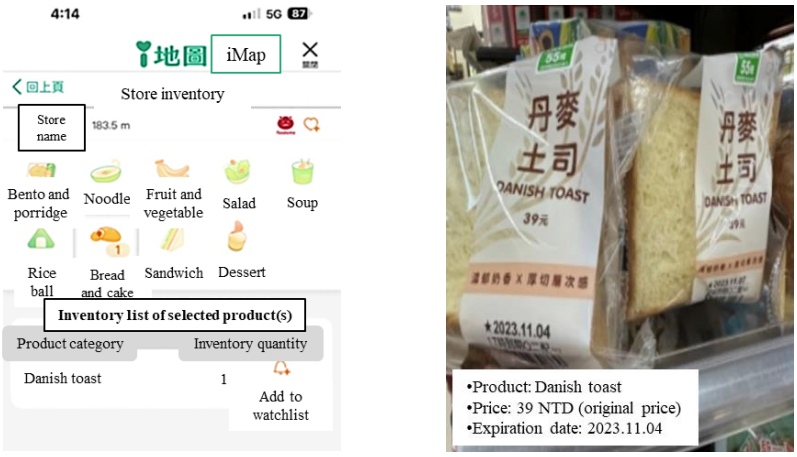
1. Introduction

The world faces a severe food waste crisis, with approximately 1.3 billion tons of food discarded annually, roughly one-third of which is wasted during production, harvesting, transportation, and consumption [1]. Over 50% of food waste occurs in restaurants and at the consumer level, including near-expired convenience store meals [2]. Meanwhile, about 2 billion people still lack stable access to sufficient and nutritious food. In Taiwan, approximately 4.05 million tons of food are wasted each year, while hundreds of thousands of marginalized families still struggle to meet basic nutritional needs. Furthermore, as the world's second-most densely populated country for convenience stores, Taiwan has stores that discard about 500 metric tons of food each month. Previous studies have also pointed out that fresh foods with a shelf life of only 24 hours account for 80% of this waste.

To address food waste and support sustainable development, convenience stores have begun offering discounts on near-expired food products to reduce waste. Some have also implemented technological solutions and promotional strategies to encourage the sale of these items. Fig. 1 shows an example from 7-Eleven, one of the leading convenience store chains in Taiwan. The left panel (a) shows a screenshot of the 7-Eleven mobile application (iMap), which displays real-time inventory

* Corresponding author. E-mail address: chlin0325@mail.knu.edu.tw

for specific food categories. The right panel (b) presents a photograph of the corresponding physical product on the store shelf. The primary discount periods are 7:00 PM to 7:59 PM (20% off) and 8:00 PM to 3:00 AM (35% off). These discounts apply to categories such as fresh meals, bread, and desserts, with a maximum discount of 35%. This process illustrates the mechanism used to track near-expired or available meals in the study.



(a) The interface of iMap (b) The corresponding physical product

Fig. 1 Mobile application for locating near-expired meals in convenience stores

From a theoretical perspective, prior research on food waste reduction has focused on the technology acceptance model [3]. However, few studies have examined consumer behavior toward near-expired convenience store meals using the VAB model. The VAB model proposes a hierarchical structure in which values influence attitudes, which in turn shape behaviors, linking internal psychological constructs to observable actions [4]. Values influence consumer actions through attitudes, forming a hierarchical structure that is considered stable, organized, and internalized psychological constructs. Researchers argue that values reflect how individuals prioritize behavioral goals, thereby providing predictive power for behavior [5-6]. Within this framework, personal perspectives are shaped by environmental factors, highlighting the crucial role in shaping consumer behavior.

The VAB model remains highly relevant in sustainability research. For instance, Habib et al. [7] used VAB to study food waste reduction in UK households, finding that values such as hedonism and community spirit positively influenced attitudes and subsequent intentions to reduce waste. Other studies [8] have validated the model in green consumption contexts by linking environmental consciousness to green purchasing. Recent applications [9] have also used VAB to analyze attitudes toward autonomous public transport in the US, confirming that functional and emotional values drive sustainable choices. Additionally, Kim et al. [10] extended the model to space tourism and AI, proving its versatility. These studies confirm that VAB is a robust framework for dissecting the VAB chain in eco-conscious markets.

Researchers have also noted that values are crucial determinants of behavioral intentions and decision-making, particularly through perceived value. For example, Tuncer et al. [11] discovered that service quality, food quality, timeliness, and facility comfort positively impact customers' perceived value, thereby improving behavioral intentions. Overall, scholars suggest that cognition influences attitude, which in turn affects behavior.

To fill the gaps, this study aims to investigate how consumers' perceived value dimensions, encompassing altruistic, app convenience, and monetary value, influence both rational and emotional attitudes toward near-expired convenience store meals. Furthermore, the research examines how these attitudes subsequently influence multiple behavioral intentions, including purchasing near-expired convenience-store meals, adopting related mobile applications, and reducing food waste. The findings provide convenience store operators with strategic insights to inform future management and operational decisions, while contributing to environmental sustainability and corporate social responsibility.

2. Theoretical Framework

This study uses the VAB model as a theoretical framework to analyze how consumers' perceived values of near-expired convenience store meals, such as altruistic value (AV), app convenience value (ACV), and monetary value (MV), influence their emotional and rational attitudes. It further investigates how these attitudes shape behavioral intentions, including purchasing near-expired meals, downloading apps, and participating in reducing food waste. Zeithaml [6] defined value as a customer's overall assessment of a product or service. Prior research has shown that altruistic values, such as community spirit and green identity, serve as critical antecedents of food waste reduction and moral obligation [7, 12]. Additionally, Tian et al. [13] highlighted that value assessment in digital environments effectively balances perceived risks and benefits, thereby enhancing the overall perceived value of these food items.

Attitude is defined as a lasting evaluation or emotional response to a concept, formed through learning and experience. Breckler et al. [14] identified three components of attitude: cognition, affect, and behavioral disposition. Cognition involves rational assessment, whereas affect pertains to emotional reactions that can be swayed by positive (e.g., joy) or negative (e.g., guilt) emotions. Once formed, attitudes tend to remain stable and guide behavior unless disrupted by major external shifts. These attitudes, in turn, affect their behavioral intentions. Based on the above literature, this study proposes that consumers' perceived value is further hypothesized to affect their emotional attitude (EA) and rational attitude (RA), thereby increasing their willingness to participate in food waste reduction activities.

Behavioral intention, the immediate precursor to action, represents an individual's readiness to perform a behavior. The VAB model has been consistently applied in marketing research to examine behavioral intentions rather than observed behaviors, as intentions capture evaluative readiness shaped by the value-attitude chain. For example, Luceri et al. [15] identified behavioral intention as a key mediating variable between attitudinal drivers and actual purchase. Similarly, McLean et al. [16] examined consumer attitudes toward retailers' mobile applications and adopted intention as the dependent variable to capture the transition from attitude formation to app adoption, particularly in the early stages where actual usage remains limited. In sustainability studies, intention-based measurement has likewise been adopted as the primary approach.

Zhong [17] examined the influence of reference groups on purchase intentions for near-expired food. Li et al. [12] investigated how message types and the subjects of recommendations shape consumers' suboptimal food purchase intentions. Both studies positioned behavioral intention as the outcome variable rather than observed purchasing behavior, consistent with the VAB framework adopted in this study. In the present study, three types of behavioral intentions are examined: purchase intention (PI), app download intention (ADI), and intention to participate in reducing food waste (IPR). The proposed framework is illustrated in Fig. 2.

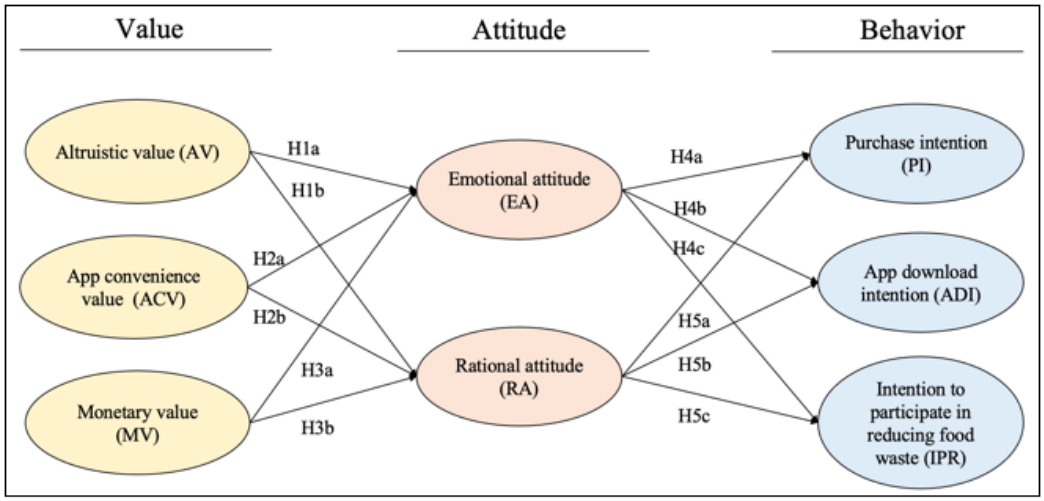


Fig. 2 Research framework

3. Hypotheses Development

In sustainability and sustainable consumption research, attitude often reflects concern for environmental conservation. Li et al. [12] further indicate that pro-environmental attitudes are increasingly shaped by the interaction between green identity and the type of information provided to consumers, such as fact-based or affect-based. Greater awareness of conservation typically leads to stronger pro-environmental behaviors. Sheikh et al. [8] noted that eco-conscious tourists are often willing to pay premiums for organic food and engage in waste reduction behaviors.

Recent literature suggests that purchase intentions for near-expired food are significantly driven not only by environmental concern but also by reference groups and the balance between perceived benefits and risks [17]. This perspective aligns with findings that such sustainable behaviors are often triggered when tailored digital messaging successfully activates a consumer's green identity [12]. Schwartz's value theory [18] provides the theoretical foundation for these observations, suggesting that such pro-social and pro-environmental responses are fundamentally driven by altruistic values. Altruism can influence attitudes through both emotional (affective) and rational (cognitive) pathways, thereby shaping consumers' responses toward near-expired food. Accordingly, the following hypotheses are developed:

H1a: Altruistic values positively influence affective attitude.
H1b: Altruistic values positively influence rational attitude.

According to the technology acceptance model, perceived ease of use positively influences users' perceived usefulness and attitude toward use, highlighting the importance of convenience in technology adoption. Convenience reflects consumers' preference for solutions that save time and reduce effort. Gehrt and Yale [19] further argued that incorporating convenience design into marketing strategies can effectively enhance customer satisfaction and retention rates. In the context of mobile apps, "convenience" refers to operational simplicity, seamless workflow, and functional design that responds promptly to user needs. Such conveniences not only reduce time costs and cognitive load but also enhance consumers' pleasurable experiences and evaluations of efficiency. Consequently, app convenience simultaneously elevates consumers' affective responses (e.g., positive feelings, enjoyment, and satisfaction) and rational assessments (e.g., efficiency, effectiveness, and perceived value), thereby strengthening their attitudes toward the app. Based on the above arguments, two hypotheses are presented:

H2a: App convenience value positively influences affective attitude.
H2b: App convenience value positively influences rational attitude.

Recent research emphasizes that value assessment plays a pivotal role in shaping consumer psychology within digital commerce [13]. This is consistent with the findings of Yadav et al. [20], who demonstrated that perceived value significantly influences consumer attitudes in sustainable contexts. Consequently, monetary value serves as a critical determinant of consumer attitudes toward purchasing near-expired food. Thus, two hypotheses are proposed:

H3a: Monetary value positively influences affective attitude.
H3b: Monetary value positively influences rational attitude.

Breckler et al. [14] proposed that attitudes comprise three components: cognition, affect, and behavioral intention. The affective component refers to emotional responses toward specific objects, while cognition involves evaluative judgments. These components further develop behavioral tendencies and guide subsequent actions. In studies of green consumption and environmental behavior, the VAB model is widely applied. Ding [21] also demonstrated that restaurant patrons' self-efficacy and collective efficacy positively influence their intention to reduce food waste, with this relationship moderated by moral judgments. This highlights the crucial role of attitudes and psychological evaluation mechanisms in shaping environmentally related behaviors.

Overall, consumers with positive attitudes (whether emotional or rational) exhibit a heightened willingness to engage in green consumption, adopt digital applications, and participate in environmentally friendly behaviors. Prior research has also highlighted that the VAB and theory of reasoned action provide crucial theoretical support for the attitude-behavior link. Attitudes toward new technologies have been found to significantly influence their intentions to use them [22]. This aligns with perspectives from the VAB and the theory of planned behavior (TPB), demonstrating that attitudes significantly influence behavioral intentions in both environmental behavior and technology adoption contexts. Therefore, this study proposes the following hypotheses:

H4a: Affective attitude positively influences purchase intention.

H4b: Affective attitude positively influences intention to download the app.

H4c: Affective attitude positively influences intention to participate in reducing food waste.

H5a: A rational attitude positively influences purchase intention.

H5b: A rational attitude positively influences intention to download the app.

H5c: A rational attitude positively influences intention to participate in reducing food waste.

4. Methods

Data for this study were collected via an online convenience sampling method on social media. In line with the research purpose of examining consumers' intentions regarding near-expired foods, participants were not restricted to those with prior transaction experience. Instead, this study investigates the psychological mechanism through which consumer values shape attitudinal and intentional responses. As the VAB framework positions behavioral intention, rather than actual behavior, as the terminal dependent variable, prior purchase experience is not a prerequisite for participation. This approach aligns with the broader sustainability literature, in which intention-based models are commonly employed to capture individuals' readiness to act, particularly when the target behavior is not yet widespread among the general population.

The survey yielded 222 valid responses from active internet users. As shown in Table 1, 48.6% of respondents were aged 19–29, a group characterized by high engagement with mobile applications in retail transactions [15–16]. Participants were 41.4% male and 58.6% female, with a majority holding a university degree (63.1%). Predominant occupations included students (20.7%), service industry workers (19.8%), and business professionals (19.4%), accounting for nearly 60% of the sample.

Table 1 Demographic characteristics of the research sample (N=222)

Attributes	Category	Count	Percent
Gender	Male	92	41.4%
	Female	130	58.6%
Age	Under 18	3	1.4%
	19-29	108	48.6%
	30-39	38	17.1%
	40-49	13	5.9%
	50-59	44	19.8%
	60-69	16	7.2%
Education	Junior High School	1	0.5%
	Senior High School	24	10.8%
	University	140	63.1%
	Master's Degree	47	21.2%
	Doctoral Degree	10	4.5%

Table 1 Demographic characteristics of the research sample (N=222) (continued)

Attributes	Category	Count	Percent
Occupation	Military	5	2.3%
	Government Employee	6	2.7%
	Education	12	5.4%
	Business	43	19.4%
	Manufacturing	12	5.4%
	Agriculture	2	0.9%
	Hi-Tech	23	10.4%
	Medical	5	2.3%
	Service Industry	44	19.8%
	Homemaker	9	4.1%
	Students	46	20.7%
	Retired	15	6.8%

The survey utilized a 7-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree). Measurement items were derived from established scales in the literature and adapted to the context. To ensure linguistic accuracy between the original English items and the Chinese questionnaire, a back-translation procedure was employed and validated by three experts in statistics, sustainability, and information systems.

The altruistic value scale was adapted from Park [23] and comprised five items; the app convenience value scale was adapted from Childers et al. [24] and included five items; and the monetary value scale was adapted from Wang and Kaplanidou [25] and comprised four items. The emotional attitude scale referenced Wang and Kaplanidou [25] and Manca and Fornara [26], comprising seven items, while the rational attitude scale was adapted from De Groot et al. [27] and included four items. These constructs were selected to capture both affective and cognitive evaluations of consumer responses toward near-expired food products.

The purchase intention scale, adapted from Dodds et al. [28], comprised seven items. The app download intention scale was adapted from Baek [29] and comprised four items, while the intention to reduce food waste was adapted from Park [30] and consisted of three items. These measures were designed to capture different levels of consumer engagement, ranging from purchase decisions to technology adoption and pro-environmental behavioral intentions. All the items are provided in the Appendix.

5. Results

Partial least squares structural equation modeling (PLS-SEM) via SmartPLS was used to validate the model due to its predictive capability and effectiveness for complex models without strict normality assumptions. The analysis proceeded in two stages. First, the measurement model was performed to assess the reliability and validity of each latent variable, including descriptive statistics, internal consistency reliability, construct validity, and discriminant validity. Second, the structural model was assessed to confirm relationships among variables and the significance of path coefficients.

5.1 Measurement assessment

Reliability and validity were assessed using factor loadings, composite reliability (CR), average variance extracted (AVE), and Cronbach's alpha. As shown in Table 2, Cronbach's alpha and CR values exceeded 0.7 (Cronbach's alpha: 0.90-0.98; CR: 0.94-0.98), indicating strong internal consistency. Evidence for convergent validity was provided by factor loadings that were greater than 0.7 and statistically significant. All AVE values surpassed 0.5, with factor loadings ranging from 0.86 to 0.98 and t-values from 26.36 to 220.44. AVE values ranged from 0.67 to 0.88.

Table 2 Results of reliability and validity

Construct	Item	Mean	Standard deviation	Loading	*t*-value	Cronbach's alpha	Composite reliability	Average variance extracted
Altruistic value (AV)	AV1	5.88	1.37	0.86	35.09	0.94	0.96	0.81
	AV2	5.78	1.39	0.88	26.36			
	AV3	5.49	1.43	0.91	54.87			
	AV4	5.72	1.35	0.92	63.99			
	AV5	5.75	1.34	0.94	71.06			
App convenience value (ACV)	ACV1	5.53	1.45	0.87	26.42	0.96	0.97	0.85
	ACV2	5.62	1.42	0.93	51.78			
	ACV3	5.81	1.36	0.93	71.03			
	ACV4	5.66	1.38	0.95	92.44			
	ACV5	5.59	1.42	0.93	72.46			
Monetary value (MV)	MV1	5.64	1.37	0.90	55.24	0.92	0.94	0.8
	MV2	5.26	1.67	0.90	59.96			
	MV3	5.35	1.46	0.88	38.21			
	MV4	5.52	1.43	0.91	67.11			
Emotional attitude (EA)	EA1	5.64	1.40	0.95	115.87	0.97	0.98	0.91
	EA2	5.34	1.53	0.95	99.52			
	EA3	5.48	1.52	0.96	157.16			
	EA4	5.39	1.59	0.95	84.89			
Rational attitude (RA)	RA1	6.21	1.27	0.93	57.55	0.94	0.96	0.85
	RA2	6.27	1.20	0.92	40.04			
	RA3	6.23	1.19	0.94	67.86			
	RA4	6.32	1.12	0.91	29.87			
Purchase intention (PI)	PI1	5.48	1.60	0.97	190.84	0.96	0.97	0.93
	PI2	5.55	1.61	0.97	187.71			
	PI3	5.10	1.72	0.95	98.42			
App download intention (ADI)	ADI1	5.16	1.74	0.97	137.95	0.98	0.98	0.94
	ADI2	5.22	1.74	0.96	77.71			
	ADI3	5.09	1.76	0.98	220.44			
	ADI4	5.12	1.76	0.97	85.70			
Intention to participate in reducing food waste (IPR)	IPR1	5.95	1.28	0.93	74.54	0.90	0.94	0.83
	IPR2	5.70	1.43	0.91	43.71			
	IPR3	5.63	1.59	0.89	38.12			

Table 3 Descriptive statistics, variance explained, and correlations

	AV	ACV	MV	EA	RA	PI	ADI	IPR
AV	0.90							
ACV	0.60	0.92						
MV	0.48	0.67	0.90					
EA	0.56	0.64	0.82	0.96				
RA	0.75	0.63	0.56	0.59	0.92			
PI	0.48	0.56	0.81	0.83	0.51	0.96		
ADI	0.49	0.67	0.70	0.71	0.53	0.80	0.97	
IPR	0.72	0.67	0.68	0.73	0.77	0.75	0.70	0.91

Discriminant validity was established, as the square root of AVE for each construct exceeded its correlations with other constructs. The square roots of AVE ranged from 0.90 to 0.97, all surpassing inter-construct correlations (see Table 3). The fornell-larcker criterion further confirmed that each construct explained more variance within its own items than with other constructs, supporting discriminant validity. These findings indicate that the constructs are distinct and measure separate concepts.

To further verify discriminant validity, this study utilized the heterotrait-monotrait ratio (HTMT) criterion. As shown in Table 4, all HTMT values range from 0.51 to 0.86, remaining well below the recommended conservative threshold of 0.90. These results, in conjunction with the fornell-larcker criterion, confirm that all latent constructs are empirically distinct, thereby providing strong support for the discriminant validity.

Table 4 Results of HTMT for constructs

	AV	ACV	MV	EA	RA	PI	ADI
AV							
ACV	0.63						
MV	0.52	0.71					
EA	0.59	0.66	0.86				
RA	0.79	0.67	0.60	0.61			
PI	0.51	0.59	0.86	0.86	0.54		
ADI	0.51	0.69	0.74	0.73	0.55	0.82	
IPR	0.78	0.73	0.75	0.78	0.84	0.81	0.75

To assess potential common method bias (CMB), this study performed a full collinearity variance inflation factor (VIF) test. When all VIFs from a full collinearity test are at or below 3.3, common method bias is unlikely to be a concern. In this study, all inner VIF values ranged from 1.53 to 2.20, which are well below the suggested threshold.

5.2 Assessment of hypothetical relationships in the proposed model

In this study, the majority of hypotheses were supported, indicating the VAB model is suitable for this context. The R^2 values for attitude constructs were 70% (emotional attitude) and 63% (rational attitude). For behavioral constructs, the R^2 values were 70% (purchase intention), 53% (app download intention), and 71% (intention to participate in reducing food waste).

Among these structural relationships, altruistic value had significant effects on both emotional and rational attitudes, with path coefficients of 0.19 ($p < 0.001$) and 0.55 ($p < 0.001$), supporting H1a and H1b. App convenience value had a significant positive effect on rational attitudes (path coefficient = 0.20, $p < 0.001$), supporting H2b. Monetary value also had a notable positive impact on both emotional and rational attitudes, with path coefficients of 0.67 ($p < 0.001$) and 0.16 ($p < 0.001$), supporting H3a and H3b.

Emotional attitude strongly influenced purchase intention, app download intention, and willingness to reduce food waste, with path coefficients of 0.81, 0.61, and 0.42 (all $p < 0.001$), supporting H4a–H4c. Rational attitude significantly affected app download intention ($\beta = 0.17$, $p < 0.01$) and food waste reduction intention ($\beta = 0.53$, $p < 0.001$), supporting H5b and H5c. Two hypotheses were not supported: H2a (app convenience value on emotional attitude) and H5a (rational attitude on purchase intention), with path coefficients of 0.07 ($t = 1.02$) and 0.04 ($t = 0.78$), respectively. The results are presented in Fig. 3 and Table 5.

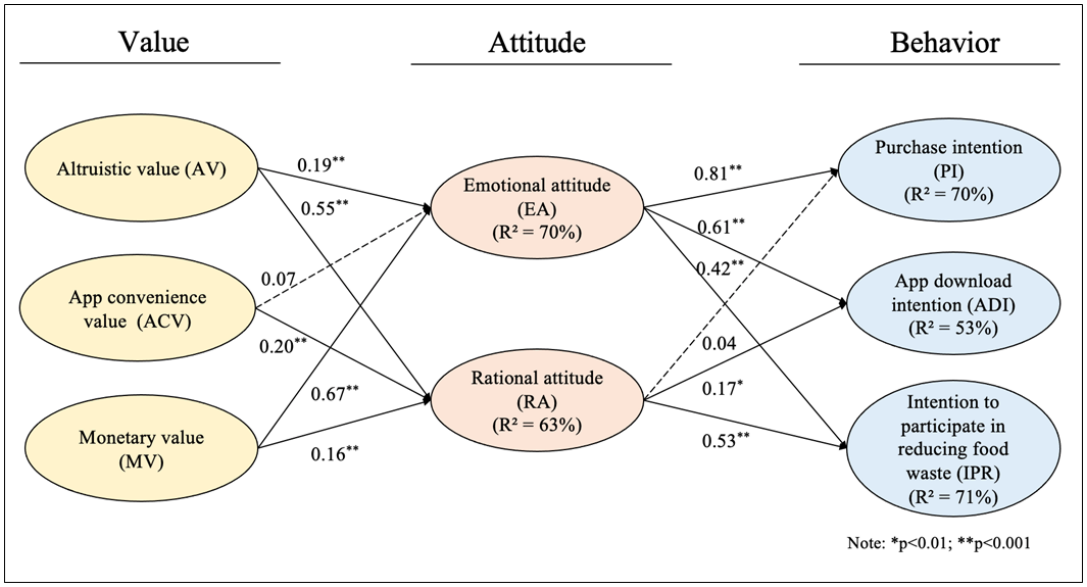


Fig. 3 Results of the structure model

Table 5 Summary of hypothesis testing results

Hypothesis	Path	β	*t*-value	Results
H1a	AV → EA	0.19**	3.54	Support
H1b	AV → RA	0.55**	9.84	Support
H2a	ACV → EA	0.07	1.02	Not support
H2b	ACV → RA	0.20**	3.79	Support
H3a	MV → EA	0.67**	9.68	Support
H3b	MV → RA	0.16**	3.49	Support
H4a	EA → PI	0.81**	18.92	Support
H4b	EA → ADI	0.61**	9.58	Support
H4c	EA → IPR	0.42**	7.56	Support
H5a	RA → PI	0.04	0.78	Not support
H5b	RA → ADI	0.17*	3.08	Support
H5c	RA → IPR	0.53**	9.35	Support

Note: *p<0.01; **p<0.001

The non-significance of H5a highlights a rational-behavior gap: cognitive awareness of food waste facilitates systemic, future-oriented goals (i.e., app download intention and intention to participate in reducing food waste) but fails to trigger immediate purchase intention. This asymmetry can be interpreted through the lens of construal level theory, which posits that abstract, temporally distant goals are more readily activated by rational evaluations, whereas concrete, immediate decisions are more responsive to affective cues. In the present context, a rational attitude aligns with the abstract goal of environmental protection but does not translate into the concrete act of purchasing a near-expired product.

In contrast, emotional attitude emerges as the dominant driver for purchase intention ($\beta = 0.81$, $p < 0.001$). For near-expired food products, purchase decisions involve a degree of immediacy and uncertainty that renders affective responses (e.g., satisfaction and pride) more influential than cognitive appraisals of environmental benefits. This finding delineates a boundary condition of the VAB model: the rational pathway supports systemic engagement, while the affective pathway is essential for overcoming purchase barriers associated with perishable goods.

6. Discussion

The study found that enhancing consumers' emotional attitudes toward near-expired food (e.g., feelings of happiness, satisfaction, and pride) can be achieved by emphasizing both its monetary and altruistic value. For instance, demonstrating the cost-effectiveness of near-expiry fresh food increases its appeal. To strengthen rational attitudes, it is essential to highlight the role of near-expired food in addressing environmental issues related to food waste, thereby reinforcing the ethical significance of reducing waste and making informed food choices.

To increase consumers' willingness for near-expiry fresh food, efforts should primarily focus on enhancing emotional attitudes toward it. Providing a positive shopping experience or offering discounts on near-expiry products may foster consumer satisfaction. Similarly, strengthening emotional attitudes is also crucial to encourage app downloads. For example, integrating interactive features such as mini-games and point-collection systems may enhance user engagement. Although rational attitudes play a weaker role, they can still support download intentions by offering rational incentives, such as presenting clear statistics on the quantity of near-expiry food purchased, thereby highlighting consumers' contributions to waste reduction and environmental protection.

Finally, promoting participation in food waste reduction requires reinforcing both rational and emotional attitudes, as both exert comparable influence on the intent to participate. Unlike typical discounted goods, near-expired meals in Taiwan's convenience stores maintain the same quality and safety standards as full-priced items. The discount reflects a strategic time-based management approach for fresh food with a 24-hour shelf life, rather than a compromise in product integrity.

Overall, this study provides three key theoretical contributions to the VAB and sustainable consumption literature. First, by distinguishing between rational and emotional dimensions, it reveals a distinct rational-behavior gap. In this study, the results showed that rational awareness of food waste facilitates systemic engagement (e.g., app adoption and general waste reduction) but remains insufficient to drive immediate purchase intentions for near-expired goods. Second, the results extend traditional technology adoption theories by demonstrating that app convenience is a purely functional driver that does not necessarily evoke emotional satisfaction in the context of green consumption. Finally, the findings delineate the boundaries of the VAB model in a high-trust retail environment. They suggest that altruistic motivations may mitigate the influence of social stigma typically associated with surplus food, though this mechanism was not directly measured. These insights advance the understanding of the complex VAB chain beyond general pro-environmental behavior contexts.

7. Conclusions

This study employed the VAB model to examine how consumer values shape attitudes and behavioral intentions toward near-expired meals in Taiwanese convenience stores. The model accounted for 63%–71% of the variance in the dependent variables, demonstrating strong explanatory power. The main findings are summarized as follows:

(1) Monetary value exerted the strongest effect on emotional attitude, while altruistic value most strongly shaped rational attitude. App convenience contributed to a rational attitude but had no significant effect on emotional attitude, likely because such features are perceived as baseline functional expectations rather than affective triggers.

(2) The attitude-behavior linkage operated asymmetrically. Emotional attitude was the dominant predictor of purchase intention, whereas rational attitude was the principal driver of intention to engage in food waste reduction, indicating that immediate decisions and future-oriented commitments draw on distinct evaluative pathways.

(3) This study contributes to the literature by offering a more detailed understanding of the VAB framework, demonstrating that the effectiveness of different attitudinal pathways varies depending on behavioral context. These findings extend existing sustainability research by identifying the moderating role of temporal proximity in shaping the attitude–behavior link.

(4) Several limitations should be noted. The sample primarily represents digital natives, and future research should employ stratified sampling across broader age groups. To maintain theoretical parsimony, this study excluded food safety, income, and price sensitivity. These variables warrant inclusion in future models. Finally, as the findings are situated within Taiwan's high-trust retail context. Cross-cultural replication is essential for generalization.

Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Sarthi, M. Singh, A. Wagh, V. Johar, and V. Bisht, “Food Waste Management: A Way Forward for Ensuring Food Security and Sustainability,” Environment Conservation Journal, vol. 25, no. 4, pp. 1191-1203, 2024.

[2] M. E. Buisman, R. Haijema, and J. M. Bloemhof-Ruwaard, “Discounting and Dynamic Shelf Life to Reduce Fresh Food Waste at Retailers,” International Journal of Production Economics, vol. 209, pp. 274-284, 2019.

[3] L. Huang, O. Papaluca, M. Tani, and A. A. A. Bukhari, “Towards the Development of More Sustainable Services: Investigating Functional and Experiential Drivers of Consumer Behavior in Online Food Delivery Market,” Sustainable Development, vol. 34, no. 1, pp. 1399-1410, 2026.

[4] Z. Nazirova and S. Borbala, “Values, Attitudes and the Behaviour Paradigm: A Systematic Literature Review,” Journal of Human Values, vol. 30, no. 2, pp. 214-239, 2024.

[5] J. D. Pincus, "Values as Motives: Implications for Theory, Methods, and Practice," Integrative Psychological and Behavioral Science, vol. 58, no. 4, pp. 1704-1750, 2024.
[6] V. A. Zeithaml, "Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence," Journal of Marketing, vol. 52, no. 3, pp. 2-22, 1988.
[7] M. D. Habib, P. Kaur, V. Sharma, and S. Talwar, "Analyzing the Food Waste Reduction Intentions of UK Households. A Value-Attitude-Behavior (VAB) Theory Perspective," Journal of Retailing and Consumer Services, vol. 75, article no. 103486, 2023.
[8] A. A. Sheikh, M. F. Yousaf, M. S. Alshuaibi, B. Tariq, S. Durrani, I. Hameed, et al., "Modeling a Value-Attitude-Behavior Framework and Personality Traits: Examining Consumers' Green Purchase Behavior for Environmentally Friendly Technology Products," Discover Sustainability, vol. 6, article no. 779, 2025.
[9] E. Hong, J. Park, and B. Lim, "Exploring Perceived Value's Impact on Attitudes in Autonomous Public Transportation Services: A Multi-Dimensional Approach," Total Quality Management & Business Excellence, vol. 36, no. 1-2, pp. 100-124, 2025.
[10] M. J. Kim, C. M. Hall, O. Kwon, and K. Sohn, "Space Tourism: Value-Attitude-Behavior Theory, Artificial Intelligence, and Sustainability," Journal of Retailing and Consumer Services, vol. 77, article no. 103654, 2024.
[11] I. Tuncer, C. Unusan, and C. Cobanoglu, "Service Quality, Perceived Value and Customer Satisfaction on Behavioral Intention in Restaurants: An Integrated Structural Model," Journal of Quality Assurance in Hospitality & Tourism, vol. 22, no. 4, pp. 447-475, 2021.
[12] S. Li, X. Huang, Y. Sheng, and K. Chen, "The Interactive Effect of Recommendation Subjects and Message Types on Consumers' Suboptimal Food Purchase Intentions," Journal of Retailing and Consumer Services, vol. 84, article no. 104200, 2025.
[13] Q. Tian, W. Gao, Y. Lin, Y. Yu, and C. Li, "Online Purchasing and Household Food Waste: Unpacking the Role of Value Assessment Discrepancies from Purchase to Usage," Journal of Retailing and Consumer Services, vol. 89, part A, article no. 104594, 2026.
[14] S. J. Breckler, "Empirical Validation of Affect, Behavior, and Cognition as Distinct Components of Attitude," Journal of Personality and Social Psychology, vol. 47, no. 6, pp. 1191-1205, 1984.
[15] B. Luceri, T. H. A. Bijmolt, S. Bellini, and S. Aiolfi, "What Drives Consumers to Shop on Mobile Devices? Insights from a Meta-Analysis," Journal of Retailing, vol. 98, no. 1, pp. 178-196, 2022.
[16] G. McLean, K. Osei-Frimpong, K. Al-Nabhani, and H. Marriott, "Examining Consumer Attitudes towards Retailers' M-Commerce Mobile Applications – An Initial Adoption vs. Continuous Use Perspective," Journal of Business Research, vol. 106, pp. 139-157, 2020.
[17] Y. Zhong, "The Influence of Reference Group on Consumers' Purchase Intention of Near-Expired Food," Asia Pacific Journal of Marketing and Logistics, vol. 37, no. 11, pp. 3291-3310, 2025.
[18] S. H. Schwartz, "Basic Values: How They Motivate and Inhibit Prosocial Behavior," in Prosocial Motives, Emotions, and Behavior: The Better Angels of Our Nature, M. Mikulincer and P. R. Shaver, Eds., Washington, DC: American Psychological Association, 2010, pp. 221-241.
[19] K. C. Gehrt and L. J. Yale, "The Dimensionality of the Convenience Phenomenon: A Qualitative Reexamination," Journal of Business and Psychology, vol. 8, no. 2, pp. 163-180, 1993.
[20] R. Yadav, M. S. Balaji, and C. Jebarajakirthy, "How Psychological and Contextual Factors Contribute to Travelers' Propensity to Choose Green Hotels?" International Journal of Hospitality Management, vol. 77, no. 1, pp. 385-395, 2019.
[21] L. Ding, "The Effects of Self-Efficacy and Collective Efficacy on Customer Food Waste Reduction Intention: The Mediating Role of Ethical Judgment," Journal of Hospitality and Tourism Insights, vol. 5, no. 4, pp. 752-770, 2022.
[22] C. H. Hsiao, C. P. Chen, H. C. Yang, J. L. Liang, and K. Y. Tang, "Examining the Impact of Sustainable Value and Economic Value on TPASS Usage Intention," Advances in Technology Innovation, vol. 11, no. 1, pp. 79-89, 2026.
[23] C. Park, S. Lee, C. K. Lee, and Y. Reisinger, "Volunteer Tourists' Environmentally Friendly Behavior and Support for Sustainable Tourism Development Using Value-Belief-Norm theory: Moderating Role of Altruism," Journal of Destination Marketing & Management, vol. 25, article no. 100712, 2022.
[24] T. L. Childers, C. L. Carr, J. Peck, and S. Carson, "Hedonic and Utilitarian Motivations for Online Retail Shopping Behavior," Journal of Retailing, vol. 77, no. 4, pp. 511-535, 2001.
[25] R. T. Wang and K. Kaplanidou, "I Want to Buy More Because I Feel Good: The Effect of Sport-Induced Emotion on Sponsorship," International Journal of Sports Marketing and Sponsorship, vol. 15, no. 1, pp. 52-66, 2013.
[26] S. Manca and F. Fornara, "Attitude Toward Sustainable Transport as a Function of Source and Argument Reliability and Anticipated Emotions," Sustainability, vol. 11, no. 12, article no. 3288, 2019.
[27] J. I. M. de Groot, K. Bondy, and G. Schuitema, "Listen to Others or Yourself? The Role of Personal Norms on the Effectiveness of Social Norm Interventions to Change Pro-Environmental Behavior," Journal of Environmental Psychology, vol. 78, article no. 101688, 2021.

[28] W. B. Dodds, K. B. Monroe, and D. Grewal, "Effects of Price, Brand, and Store Information on Buyers' Product Evaluations," Journal of Marketing Research, vol. 28, no. 3, pp. 307-319, 1991.

[29] Y. Baek, "Analysis of User's Attitude Toward Apps, Intention to Use and Continual Consuming Intention–Focused on Mobile Commerce," International Journal of Contents, vol. 9, no. 4, pp. 35-44, 2013.

[30] E. Park, "Social Acceptance of Green Electricity: Evidence from the Structural Equation Modeling Method," Journal of Cleaner Production, vol. 215, pp. 796-805, 2019.

Appendix: Measurement Items

Altruism Value (AV); adapted from Park et al. [23]
AV1. I am motivated to make Taiwan a better place.
AV2. I am motivated to reduce the amount of waste in Taiwan.
AV3. I am motivated to learn more about Taiwan's environmental issues.
AV4. I am motivated to fulfill moral obligations to help Taiwan's environment.
AV5. I am motivated to do something meaningful to improve Taiwan's environment.
App Convenience Value (ACV); adapted from Childers et al. [24]
ACV1. Using the near-expired food app to find items helps me save time.
ACV2. Using the near-expired food app allows me to find available items in nearby stores, saving me time.
ACV3. Using the near-expired food app to search for near-expired food is a convenient way.
ACV4. I can use the near-expired food app anytime to find food that is about to expire in nearby stores.
ACV5. I can use the near-expired food app anywhere to find near-expired food in nearby convenience stores.
Monetary Saving (MS); adapted from Wang and Kaplanidou [25]
MS1. I save money when I purchase food via the near-expired food app.
MS2. I can make inexpensive purchases via the near-expired food app.
MS3. The food I buy via the near-expired food app is cheaper than if I had made the purchase elsewhere.
Emotional Attitude (EA); adapted from Wang and Kaplanidou [25]; Manca and Fornara [26]
EA1. Purchasing near-expired convenience store meals makes me feel delighted.
EA2. I feel proud of being able to buy near-expired convenience store meals.
EA3. Purchasing near-expired convenience store meals makes me feel satisfied.
EA4. Purchasing near-expired convenience store meals makes me feel happy.
Rational Attitude (AW); adapted from De Groot et al. [27]
AW1. I feel that food waste is a serious environmental issue.
AW2. I feel that food waste is an important social issue (e.g., world hunger).
AW3. Foods are scarce over the world and should be consumed consciously.
AW4. Foods are gifts of nature and have to be treated as such.
Purchase Intention (PI); adapted from Dodds et al. [28]
PI1. The likelihood that I would purchase near-expired convenience store meals in the future is high.
PI2. My willingness to buy near-expired convenience store meals is very high.
PI3. In the near future, I would consider purchasing near-expired convenience store meals.
App Download Intention (AI); adapted from Baek [29]
AI1. I have the intention to download the near-expired food app.
AI2. I will try to download the near-expired food app.
AI3. I plan to download the near-expired food app.
AI4. The probability that I will download the near-expired food app is high.
Willingness to Reduce Food Waste (PR); adapted from Park [30]
PR1. I am willing to take practical actions to reduce food waste.
PR2. I will support the reduction of food waste through my purchasing actions.
PR3. I will recommend others to join in the effort to reduce food waste.