frontiers | Frontiers in Sustainable Food Systems

TYPE Original Research
PUBLISHED 19 February 2025
DOI 10.3389/fsufs.2025.1529612

OPEN ACCESS

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RECEIVED 17 November 2024
ACCEPTED 30 January 2025
PUBLISHED 19 February 2025

CITATION
Hou B, Chen Y and Wang Z (2025) Consumer-driven prepared food consumption policies: a sustainability perspective on reducing food waste. *Front. Sustain. Food Syst.* 9:1529612. doi: 10.3389/fsufs.2025.1529612

Consumer-driven prepared food consumption policies: a sustainability perspective on reducing food waste

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Introduction: Food waste is a global issue intricately linked to food crises and ecological degradation. The development of the prepared food industry and markets is a promising practice to reduce food waste globally and achieve carbon neutrality.

Methods: This study is grounded in the motivation -opportunity -ability (MOA) theory and employs a structural equation model (SEM) to establish an analytical framework to explore factors influencing the intentions of Chinese consumers to consume prepared food.

Results: Empirical analysis reveals that motivation, opportunity, and ability positively influence consumers' intentions to consume prepared food. Furthermore, opportunity and ability exert a mediating effect on motivation through convenience and health factors.

Discussion: This study innovatively applies the MOA theory to food waste issues, providing a new policy perspective. The conceptual framework developed offers a theoretical foundation for future research on pathways to reduce food waste, especially within the context of prepared food consumption in China, and serves as a theoretical starting point for academia, industry, and policymakers.

KEYWORDS

food waste, food consumption demand, prepared food, sustainable development, MOA theory

1 Introduction

The food industry is undergoing unprecedented changes because of the rapid progression of global economic integration and digital technologies, altering the concept of food consumption demand (Wang, 2024) Food consumption simultaneously introduces increasingly serious food and ecological problems related to limited resources and the environmental carrying capacities of terrestrial ecosystems (Han and Liang, 2024). According to the State Council (SC), it has long been difficult to balance food supply and demand and the gap between production and demand may become wider (State Council, 2024). Statistics reveal that almost 90 million tonnes of food is lost annually in the European Union alone; household waste accounts for 53% of this total food waste (Ilakovac et al., 2020) China discarded 460 million tonnes of food in 2022 incurring an economic loss of 1.88 trillion yuan, which equalled 22.3% of the total agricultural output value (Guangming Net, 2023). Japan wasted around 5.7 million tonnes of food in 2019, which amounted to 45 kg/year per capita and accounted for 84.906% of the per capita rice consumption in the same period (Yang, 2023). Food waste is widespread in countries worldwide; it depletes natural resources, increases environmental pressure and even exacerbates hunger and malnutrition

in some regions. Therefore, addressing food waste has become pivotal to achieving global food security and promoting sustainable development.

Numerous countries have confronted the challenges posed by food waste and have actively formulated goals, enacted legislation, adopted initiatives and fostered government–enterprise collaborations to curtail food waste (United Nations, 2020; Zhang and Huo, 2023). Among such mitigating initiatives, the development of industries and markets related to prepared food is considered an effective practice that can drive the decrease of global food waste and help nations achieve carbon neutrality (Rivera et al., 2014). The demands of Chinese consumers for prepared foods have been growing in recent years. China's prepared food market was estimated at 61.14 billion US dollars in 2022 with an average annual growth rate of 25%. This market size exhibits great development potential and is expected to exceed 144.8 billion US dollars by 2026 (Yi and Xu, 2023). Prepared foods are products of the economic development of the new era: they respond to the needs of specific consumer groups (Gong et al., 2024) and conform to the development trends of the modern food industry towards convenience, nutrition and health (Cheng et al., 2023). The proportion of prepared food in China's food system has increased gradually in recent years (Jin et al., 2023) and has entered a period of rapid development. The waste frequency of prepared foods is also low (Visschers et al., 2016; Silvennoinen et al., 2014). Prepared foods can effectively reduce the environmental impact of food production and consumption compared to other foods such as bakery goods, fruits and vegetables and dairy products. Prepared foods can help reduce carbon emissions and meet the goal of carbon neutrality by optimising crop cultivation, adjusting ingredients and improving food preparation (Espinoza-Orias and Azapagic, 2018). Therefore, an in-depth study of the intention of Chinese consumers to eat prepared food is of great significance for the healthy development of China's prepared food industry and for the effective reduction of food waste.

Most existing studies have explored new development pathways for prepared food at the macro level, investigating avenues such as government support (Liu, 2018), industry association (Liu and Luo, 2016), efficiency evaluation (Xu et al., 2022) and technological innovation (Wu, 2023). Purchasing behaviour characteristics and related influencing factors of C-end consumers of prepared foods are rarely analysed from the micro-subjects perspective (Zhang and Xiang, 2024). Moreover, existing studies are insufficient in terms of their refinement and quantitative analysis, especially in discussing behavioural characteristics. They have attended more to superficial reasons such as occupation, gender, age, place of residence and understanding of prepared food (Li et al., 2023). In-depth studies on the theory of consumption intentions and behaviours apropos prepared food remain scarce. This study aims to utilise the extended motivation–opportunity–ability (MOA) model from the micro-subjects perspective to intensively analyse the intention of Chinese consumers to buy prepared food and explore the potential factors affecting this intention. We intend to provide strong support for the healthy development of China's prepared food industry and offer referential value to help the Chinese government formulate scientific and reasonable prepared food consumption policies. This endeavour will encourage the transformation and upgrading of food consumption patterns and the reduction of food waste and will thus promote food security and ensure sustainable ecological development.

2 Theoretical basis and research hypotheses

2.1 Theoretical basis

This study based on Macinnis and Jaworski's MOA theory examines the influencing mechanism of the intention of Chinese consumers to consume prepared food. According to this theory motivation, opportunity and ability jointly affect the occurrence of individual or organisational behaviours (Macinnis and Jaworski, 1989). According to this conceptual framework, motivation is considered the direct driving force of action (i.e., 'whether you want to do it'); opportunity is primarily a restrictive environmental factor affecting motivation and behavioural activity (i.e., 'whether it is permissible'); and ability refers to the skills, knowledge, resources and other factors required to drive the production of behaviour (i.e., 'whether it can be done') (Macinnis et al., 1991). The MOA theory aligns with the logic of consumer psychology probing the intention of consumers to buy prepared food from the micro-subjects perspective. Therefore, this study uses the MOA theory to construct a model of consumer intention to buy prepared food and aims to identify the key influencing factors of the intention of Chinese consumers to purchase prepared food.

2.2 Research hypothesis

2.2.1 Opportunity and willingness to buy prepared foods

In the context of purchasing prepared food, opportunity refers to environmental factors that inhibit or promote the prepared food purchasing behaviours of consumers. According to Furst et al. (1996), a complex interaction exists between the possibility of consumers buying food and varied environmental factors such as the social milieu, culture and background. Long et al. (2023) adopted government support as the main indicator of opportunity factors in constructing the MOA model of the formation mechanism of the behaviours of tourism destination ambassadors and verified the positive incentive effects of opportunity factors such as government support on behaviours. In addition, Xiong et al. (2023) reported that online and offline information promotion methods applied to prepared foods through means such as social media platforms, TV advertisements and posters significantly improved the purchase intentions of consumers. Thus, they verified the positive correlation between information promotion and consumer purchase intentions. These findings highlight the importance of opportunity factors in the prepared food purchasing decisions of consumers.

Thus, the following hypothesis (H) is proposed for the present study:

> *H1*: Opportunity positively affects consumer intention to buy prepared foods.

2.2.2 Ability and intention to buy prepared foods

Ability determines the extent to which an individual can accomplish a particular action. In the context of prepared food purchasing, ability concerns knowledge, economic status and behavioural accessibility factors contemplated for decision-making

related to the purchase and consumption of prepared food. Finten et al. (2017) confirmed that consumers tend to exhibit higher purchase intentions when they enhance their knowledge of prepared foods. In addition, Figuié and Moustier (2009) further validated the positive impact of economic ability on consumer purchase intentions: they found that consumers with insufficient economic abilities could continue to display low purchase intentions even when they were satisfied with product quality. Carvalho et al.'s (2016) study included the statement 'I would consume sustainable products more often if the items were available closer to home/were available in more stores'. This statement verified the positive correlation between behavioural accessibility and purchase intentions: the intention to purchase a product increases significantly when consumers believe that purchase behaviour is possible and relatively easy. These findings highlight the significance of ability factors in consumer decision-making related to the purchase of prepared foods.

Thus, the following assumption is posited:

> *H2*: Ability positively influences consumer intention to buy prepared foods.

2.2.3 Mediating effects of motivation

Motivation refers to the internal stimulus that triggers consumer decisions to buy prepared foods. Insufficient individual motivation cannot fuel the internal driving force to produce the concerned purchase behaviour. Mullan et al. (2018) demonstrated that protective motivation exerts a positive effect on safe food-handling behaviour. Nezlek et al. (2021) study on the influencing factors of consumer intention to accept new foods disclosed that approach motivation and avoidance motivation significantly impacted intention to accept new foods. De-Boer and Schösler (2016) also confirmed that food-related value motivation affects consumer purchase intentions and preferences for different types of food. The acceptance and purchase intentions of prepared food are also substantively affected by motivational factors because they represent a new type of food product. For example, Geeroms et al.'s (2008) study posited that health-related motivation orientation significantly influenced consumer intention to consume prepared foods. Consumer acceptance and purchase intentions vis-à-vis prepared food result from diverse motivation factors.

Many existing studies conducted from the perspective of motivational influences on the intention of consumers to buy prepared foods have further subdivided motivational factors. Aviles et al.'s (2020) investigation of the relationships between consumer motivation and prepared food purchase decisions established the effects of important factors such as convenience, health and price on consumer intention to buy prepared food. That study also adopted the standpoint of health-related motivation to analyse the influence mechanism associated with consumer intention to buy prepared foods. Global consumer health awareness has increased and the health investment concept has expanded; thus, health concerns increasingly inform the consumer decision-making processes vis-à-vis prepared foods. The results of extant research reveal that positive health orientations can increase consumer intention to choose prepared foods (Weijzen et al., 2009). Geeroms et al.'s (2008) analysis of health motivation also confirmed the impact of health on the frequency of prepared food consumption. Numerous studies have probed the role of convenience in food choices and preferences (Candel, 2001; De-Boer et al., 2004). The convenience motive stems from the urgent needs of consumers for time management and life efficiencies. Convenience motivation has gradually become focally positioned in studies of consumer purchase motivations towards prepared foods because of the accelerated pace and increasing work pressures of modern lifestyles. Zhang and Xiang's (2024) study on consumer behaviour characteristics related to the consumption of prepared foods pinpointed that convenience factors such as 'convenient and quick preparation, time-saving and labour-saving' exert a significant positive impact on consumer purchase intentions towards prepared foods. Accordingly, the present study subdivides motivation factors into two subdivisions: convenience and health.

Thus, this study postulates the following hypotheses:

> *H3*: Motivation stemming from convenience factors positively affects consumer intention to buy prepared foods.
>
> *H4*: Motivation evoked by health factors positively influences consumer intention to buy prepared foods.

Previous studies on the relationships between opportunity and motivation factors have shown that motivation serves as a mediator between external stimuli and individual behaviours (Guan, 2018). Martínez-Cañas et al. (2023) pointed out that individuals are more likely to identify new business opportunities when they express the desire to explore new things and be creative: this motivation helps individuals more easily grasp opportunities. Moreover, found that opportunity factors such as social environments can motivate green behaviours in people. In turn, this motivation influences their behavioural intentions and significantly impacts their behavioural choices. This finding further emphasises the important roles enacted by motivation factors in the relationships between opportunity factors and behavioural intentions.

Thus, this study hypothesises that

> *H5a*: Convenience mediates the influence of opportunity factors on the intention of consumers to buy prepared foods.
>
> *H5b*: Healthiness mediates the influence of opportunity factors on the intention of consumers to buy prepared foods.

Motivation mediates between ability and behavioural intentions (Long et al., 2023). Lin et al. (2014) proposed that learning motivation can be improved by cultivating ability, thus positively motivating behaviour. At the same time, Li et al. (2023) strengthened the explanatory power of the research results and further verified the mediating role of Motivation by establishing the chain intermediary of "abilities-motivation-intention" in the study on energy-saving behaviour. From the detailed study of this chain intermediary, shows that individuals' behavioural motivation is stronger when economic ability allows, thus improving their behavioural intention. The aforementioned studies have all confirmed the mediating role enacted by motivation vis-à-vis the impact of ability on behavioural intentions.

Thus, the following assumptions are advanced for the present study:

> *H6a*: Convenience mediates the influence of ability on consumer intention to buy prepared foods.

> *H6b*: Healthiness mediates the influence of ability on consumer intention to buy prepared foods.

The theoretical model displayed in Figure 1 is based on the outlined research hypotheses.

3 Materials and methods

3.1 Questionnaire design and data sources

This study is primarily grounded in the MOA, relevant literature and preliminary evaluations conducted to ensure the superior content validity of the administered questionnaire. Specific items were designed as closed questions. The research group responsible for this study invited experts to review and modify the contents of the questionnaire, which was further refined based on a preliminary investigation conducted with 20 students from Jiangsu Normal University. The study programme was approved following an ethical review conducted by the Faculty Committee of Jiangsu Normal University (Protocol Ref#: JSNU-H2024CG-001). The questionnaire also incorporated informational prompts to adhere to ethical requirements and minimise social expectation bias. These prompts were positioned in the guidance section of the questionnaire and included statements such as 'there are no right or wrong answers', 'participation is voluntary', 'questionnaire responses will be kept confidential' and 'participants can withdraw at any time'.

All questionnaire items were evaluated on a five-point Likert-like scale in which 1 indicated complete disagreement and 5 signified complete agreement. Items related to the motivation factor were designed with reference to Han et al.'s (2023) study; statements testing the opportunity factor were adapted from Wang (2018) and queries on the ability factor were based on Malone's (1990) work. Two aspects of consumer intention to buy prepared food (IN) were measured: readiness to buy and intention to recommend others to buy. Table 1 presents the definitions and descriptive statistics of the variables measuring information sources.

The study survey targeted adult Chinese consumers (18 years and older). From February to March 2024, a simple random sampling method was employed to select participants. A mixed-method approach, combining both online and offline questionnaires, was utilised for data collection. Online surveys were distributed through standardized electronic questionnaires on the *SoJump* platform, with the survey link disseminated widely. For the offline component, paper questionnaires were administered in key locations, including large shopping malls, communities, and local markets, ensuring a diverse representation of the population. A total of 752 questionnaires were collected for the study.

The simple random sampling method was chosen to ensure that every individual in the target population had an equal probability of selection. This widely used and well-established method is considered reliable in survey research (Erol et al., 2023; Lanfranchi et al., 2016). However, the combined online and offline data collection approach may introduce some biases, particularly in terms of accessibility to digital platforms and the geographic and demographic concentration of the offline survey locations. To mitigate these potential biases, efforts were made to ensure a balanced distribution of the sample across different regions and consumer segments. The representativeness of the sample was further enhanced by selecting a variety of survey locations, thereby capturing a comprehensive range of consumer behaviours and preferences.

The initial data processing was performed after the questionnaires were collected. Questionnaires with short answer times, uniform or duplicated responses and missing values were invalidated and eliminated. Subsequently, the data were imported into SPSS 27.0 software for statistical analysis and thorough examination. The method of replacing anomalous values with their respective average values was employed to address individual data anomalies and ensure comprehensive data cleaning. Eventually, a total of 718 valid data samples were obtained at an effective rate of 95.479%.

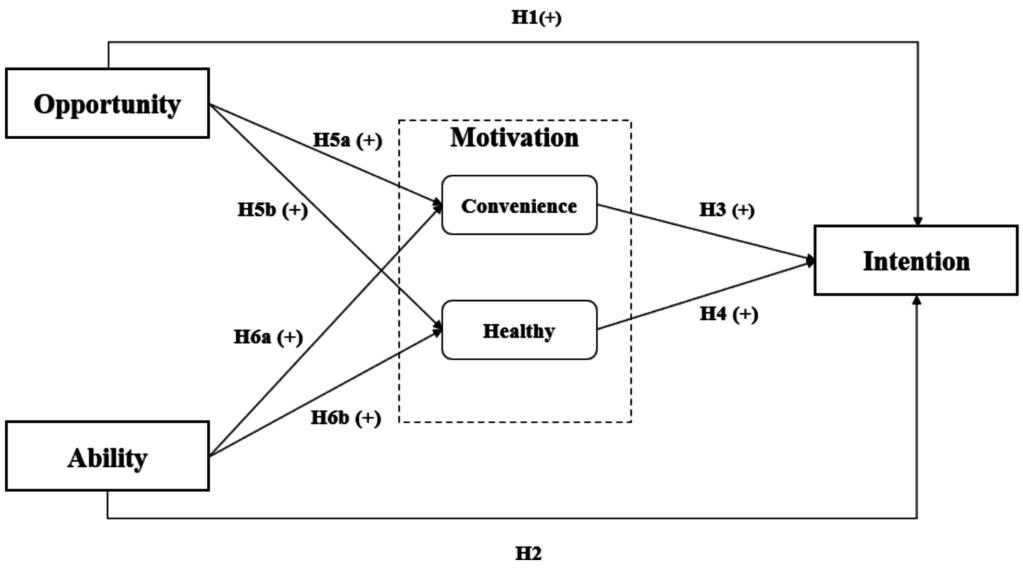

FIGURE 1
A hypothetical model for consumer intention to purchase prepared foods.

TABLE 1 Variables measuring information sources.

Variables		Description	Mean value	Standard deviation	Maximum value	Minimum value
Motivation	Convenience	MOT1-1 Prepared food saves time on shopping	3.59	1.127	5	1
		MOT1-2 Prepared food saves time in washing and preparing foods	3.66	1.125	5	1
		MOT1-3 Prepared food makes cooking easier	3.64	1.143	5	1
	Health	MOT2-1 The nutritional mix of prepared dishes is rich and reasonable	3.10	1.035	5	1
		MOT2-2 The cold chain logistics of prepared foods ensure the freshness of the ingredients	3.19	1.109	5	1
		MOT2-3 Prepared foods are produced through standardized processes to ensure food safety.	3.22	1.112	5	1
Opportunity		OPP-1 The government's release of supporting documents for the development of prepared foods will affect your purchase intentions	3.29	3.29	1.070	5
		OPP-2 The government's improved regulation of the prepared food industry will affect your intention to buy	3.50	3.51	1.068	5
		OPP-3 Government propaganda can influence your intention to buy prepared foods	3.25	3.25	1.059	5
		OPP-4 What your friends and family say about prepared foods can influence your intention to buy	3.31	3.31	1.054	5
		OPP-5 Publicity in the news media can influence your purchase intentions towards prepared foods	3.32	3.33	1.057	5
		OPP-6 Social opinions about prepared foods can influence your intention to buy	3.40	3.41	1.085	5
Ability		ABL-1 You can afford to buy prepared foods	3.37	3.38	1.002	5
		ABL-2 You have the knowledge and skills to buy and select prepared foods	2.97	2.97	1.077	5
		ABL-3 You can easily purchase prepared foods	3.37	3.38	1.057	5
Intention to buy prepared foods		IN-1 I prefer to buy prepared foods	3.17	3.17	1.076	5
		IN-2 I would like to recommend well-regarded prepared foods and share my skills and knowledge with friends and family	3.16	3.17	1.097	5

3.2 Determination of food category classification

In this study, we classified prepared foods according to the NOVA classification system, which includes Unprocessed or Minimally Processed Foods (Group 1), Processed Culinary Ingredients (Group 2), Processed Foods (Group 3), and Ultra-Processed Foods (Group 4) (Monteiro et al., 2019). According to the "Notice on Strengthening the Food Safety Supervision of Prepared Foods" jointly issued by the State Administration for Market Regulation, the Ministry of Education, the Ministry of Industry and Information Technology, the Ministry of Agriculture and Rural Affairs, the Ministry of Commerce, and the National Health Commission in March 2024, prepared foods are clearly defined as products that have been appropriately processed and packaged and can be consumed after heating or simple cooking. These foods are typically produced through industrialized and standardized methods, ensuring a longer shelf life through advanced storage and processing technologies without the use of preservatives.

According to the notice, the scope of prepared foods includes, but is not limited to, prepared dishes, frozen ready-to-cook meat products, frozen rice and noodles, etc. It does not include fresh-cut vegetables (e.g., vegetables that are simply cleaned, peeled, or cut), staple foods (e.g., frozen rice and noodle products, boxed meals, etc.), ready-to-eat foods (e.g., canned foods, sausages, salads, etc.), dishes made in central kitchens, or foods containing preservatives. This study primarily focuses on prepared foods that meet the definition above, which are considered to primarily belong to the Ultra-Processed Foods (Group 4) category in the NOVA classification.

3.3 Model selection

The Structural Equation Model (SEM) is an analytical framework that utilises the covariance matrix of variables to examine causal relationships among them. It effectively combines factor analysis and path analysis into a single quantitative research paradigm. This model allows for simultaneous estimation of both factor structures and relationships, clarifying the causal chains within complex combinations of causal conditions. Additionally, SEM estimates the overall fit between the model and the sample data, enabling verification of the model's overall suitability. Given the complex path relationships and the potential for subjective measurement errors in

latent variables in the theoretical model constructed in this study, SEM is employed for empirical analysis.

4 Data analyses

4.1 Demographic characteristics

A total of 718 valid questionnaires were collected in this study. The distribution characteristics of the samples are shown in Table 2.

4.2 Reliability and validity analysis

We tested the internal consistency of the scale via Cronbach's α coefficient. The results revealed that the overall Cronbach's α coefficient of the questionnaire was 0.908, and the Cronbach's α of each latent variable ranged from 0.805 to 0.923. This outcome indicates that the measurement model fit the data satisfactorily and exhibited good internal consistency.

In addition, we employed the Kaiser–Meyer–Olkin (KMO) and Bartlett sphericity tests to determine whether the study data were suitable for factor analysis. Next, we utilised exploratory factor analysis to determine whether the pre-grouping was reasonable. The KMO statistic for the study was calculated at 0.929, and the significance of the Bartlett sphericity test was 0.000, indicating that the data were suitable for exploratory factor analysis. We performed an exploratory factor analysis on the measurable variables of influencing factors of prepared food purchase using SPSS27.0 to analyse the mechanism of influencing factors of prepared food purchase intentions. We determined the number of factors included in the model statistics using the Oblimin oblique rotation method because of the correlation between the variables.

(1) We extracted an effective factor for motivation. The measurable variables with a factor load greater than 0.6 were MOT1-1, MOT1-2, MOT1-3, MOT2-1, MOT2-2 and MOT2-3. The cumulative variance interpretation rate of the six variables was 85.982%. The measurable variables for determining the latent variables of the motivation were MOT1-1, MOT1-2, MOT1-3, MOT2-1, MOT2-2 and MOT2-3.
(2) We used factor analysis to extract an effective factor for opportunity. The measurable variables with factor loads greater than 0.6 were OPP1, OPP2, OPP3, OPP4, OPP5 and OPP6, and the cumulative variance explanation rate of the six variables was 72.242%. The measurable variables for determining the latent attitude variables were OPP-1, OPP-2, OPP-3, OPP-4, OPP-5 and OPP-6.
(3) We extracted an effective factor for ability. The measurable variables with factor loads greater than 0.6 were ABL1, ABL2 and ABL3, and the cumulative variance explanation rate of the three variables was 72.085%. The measurable variables of the subjective normative latent variables were ABL-1, ABL-2 and ABL-3.
(4) We extracted an effective factor for the intention to buy prepared foods. The measurable variables with factor loads greater than 0.6 were IN-1 and IN-2, and the cumulative variance explanation rate of the two variables was 90.474%. The measurable variables of the subjective normative latent variables were IN-1 and IN-2.

We verified the rationality of pre-grouping in this study using exploratory factor analysis. The test results of the factor load and reliability of the measurable variables elucidated that the variance contribution of the first effective factor of the dimension formed by each latent variable exceeded 70%. Thus, the hypothesis model displayed good structural validity of the four latent variables and 17 measurable variables.

4.3 Fit degree evaluation

We utilised the AMOS 26.0 software to construct the SEM to test the hypothesis relationship between the study variables. The overall fit results presented in Table 3 confirm a good fit between the theoretical model and the sample data. Thus, the model constructed for this study was reasonable and reliable.

4.4 Hypothesis testing

4.4.1 Direct effect test

The structural model reflects the causal relationship between latent variables and can be used to verify the relationship between variables. The test results in Table 4 show that opportunity factors and ability factors exerted significant promoting effects on convenience factors, health factors and purchase intentions. Hence, H1, H2, H3 and H4 were affirmed.

4.4.2 Indirect effect test

We constructed a hypothesis model with convenience and health as the mediating variables to further study the mechanism of the intention of the public to buy prepared foods. Using the Bootstrap mediation effect testing method, we randomly selected 5,000 Bootstrap samples to estimate the indirect effects in the model. In each sampling process, we performed resampling on the original data to generate multiple bootstrap samples, thereby obtaining more robust statistical estimates.

Specifically, we employed a 95% confidence interval and used the Bias-corrected and Percentile methods for interval estimation. For each mediation effect, we checked whether the 95% confidence interval contained zero. If the confidence interval did not include zero and the two-tailed p-value was less than 0.05, the indirect effect was considered significant. Based on these criteria, the results indicated the presence of significant mediation effects, as shown in Table 5. The findings support hypotheses H5a, H5b, and H6b, while hypothesis H6a was not supported.

4.4.3 Stability test

We utilised the Amos26.0 software to conduct SEM multi-group analysis tests of different consumer groups with and without brand consideration to verify the invariance of our theoretical model for different sample segments. We established the M1 structural weights restriction model in addition to the baseline model in the multi-group test. The comparison results of model fit and nested model are presented in Table 6. The results revealed that the baseline model and

TABLE 2 Descriptive statistics.

Variable	Attribute	Number	Percentage
Gender	Males	334	46.52%
	Females	384	53.48%
Age	18–25 years old	347	48.33%
	26–35 years old	96	13.37%
	36–45 years old	106	14.76%
	46–60 years old	144	20.06%
	Over 60 years old	25	3.48%
Degree	Junior high school and below	34	4.74%
	High school	113	15.74%
	Undergraduate/ junior college	493	68.66%
	Master's degree and above	78	10.86%
Monthly income	Below 3,000 yuan	303	42.20%
	3,000–5,000 yuan	121	16.85%
	5,001–8,000 yuan	162	22.56%
	8,001–15,000 yuan	101	14.07%
	Above 15,000 yuan	31	4.32%
Marital status	Married	323	44.99%
	Unmarried	384	53.48%
	Other (divorced, widowed, etc.)	11	1.53%
Are there any children under the age of 14 at home	Yes	157	21.87%
	No	561	78.13%
Are there any elderly persons over 60 years old in the family	Yes	560	77.99%
	No	158	22.01%
Consider brand effects	Yes	288	40.11%
	No	430	59.89%
Purchase frequency of prepared food	Never	248	34.54%
	1–2 times a month	310	43.18%
	1–2 times a week	97	13.51%
	3–4 times a week	37	5.15%
	5 times or more per week	26	3.62%

the constraint model were both satisfactorily suited. Thus, we assumed that the model was universally applicable to both brand-specific consumer groups and consumers with no brand loyalty.

5 Discussion

5.1 Further analysis of direct effects

This study based on the MOA theory and SEM was conducted with survey data obtained from 718 adult consumers in China. It explored the influence mechanism of the constructs of motivation, opportunity and ability on the purchase intentions of consumers apropos prepared foods. The results revealed significant direct effects and confirmed the applicability of our model based on the MOA theory. The factors of motivation, opportunity and ability were also found to exert a positive impact on the purchase intentions of consumers vis-à-vis prepared foods. This outcome aligns with the conclusions derived by Yener et al. (2023) and Jiao and Wang (2024).

Further analysis of the degree to which varied factors influenced the purchase intentions towards prepared food evidenced that opportunity factors represented the cornerstones of consumer intentions to buy prepared foods. This result agrees with the outcomes reported by Furst et al. (1996) and Long et al. (2023). Opportunity factors include policy and institutional support, media publicity and the trust of relatives and friends of consumers, which can significantly increase their likelihood of buying prepared foods. The ability factor substantively supported purchase intentions towards prepared foods, in congruence with the results reported by Arvola et al. (2008) and Arli et al. (2018). The ability primarily entails economic ability, knowledgeability and behavioural accessibility of consumers. Prepared foods satisfy the purchasing needs of consumers because of their simple production and time-saving characteristics. Motivational factors are deemed to catalyse consumer purchase intentions towards prepared foods, and the results of this study align with previous studies. Convenience and health are important motivators in the context of purchasing prepared foods because they echo consumer quests for high-efficiency, time-saving and nutritious products. The combined effects of these two motivators encourage and shape consumer purchase intentions towards prepared foods.

Our comparison of the path coefficients of direct effects revealed that opportunity factors exercised the most influence on purchase intentions vis-à-vis prepared foods, followed by ability factors. Motivation factors least influenced consumer decision-making in this context. Our analysis of motivation factors divulged that convenience features were less important than health aspects in driving consumer decisions to buy prepared foods. This finding differs somewhat from the conclusions reported by Raimondo et al. (2024) that motivational factors most impacted consumer intention to consume recycled foods. Possibly, this study divided motivational factors into the facets of convenience and health, which could clash during actual purchase processes. For example, some high-calorie prepared foods could cause tensions between convenience and health. In such instances, consumers would weigh the two aspects and could prioritise the nutritional value and health impact of the concerned food, resulting in the diminished influence of the convenience motive. This phenomenon could further affect the actual impact of motivational factors.

5.2 Further analysis of indirect effects

The following conclusions can be derived from the analyses and comparisons of the total effect size, direct effect size and indirect effect size. The intermediate influence path of opportunity on the purchase intention of prepared food defined as Opportunity → Health → Intention contributed 0.148 indirect effect size and accounted for 47.44% of the total effect size. The direct effect size of Opportunity → Intention was 0.160, explaining

TABLE 3 The fitting results of SEM overall fitness.

Index type	Specific indicator	Evaluation criteria	Fitting value	Fitting result
Absolute fitting index	$\chi 2$/df	<3	2.923	Ideal
	Goodness of Fit Index (GFI)	>0.9	0.954	Ideal
	Adjusted Goodness of Fit Index (AGFI)	>0.9	0.930	Ideal
	Root Mean Square Residual (RMR)	<0.08	0.030	Ideal
	Root Mean Square Error Approximation (RMSEA)	<0.08	0.052	Ideal
Relative fitting index	Tucker-Lewis Index (TLI)	>0.9	0.975	Ideal
	Comparative Fit Index (CFI)	>0.9	0.981	Ideal
	Normed Fit Index (NFI)	>0.9	0.972	Ideal

51.28% of the total effect size. Thus, opportunity can affect purchase intentions both directly and indirectly through the two motivational factors of health and convenience. This finding is analogous to the results of previous studies (Long et al., 2023; Finten et al., 2017). However, the mediating path Opportunity → Convenience → Intention was not significant: it explicated only 1.28% of the total effect size. This outcome could suggest that convenience does not pivotally mediate opportunity in influencing purchase intentions towards prepared foods, especially in contexts in which convenience may not represent the primary motivation of consumers contemplating prepared food purchases.

From the perspective of the influence path of ability on purchase intentions towards prepared foods, the intermediary effect of Ability → Convenience → Intention contributed 0.018 indirect effect size and accounted for 2.59% of the total effect size. The intermediate effect of Ability → Health → Intention contributed 0.351 indirect effect size, explaining 50.58% of the total effect size. The direct effect size of Ability → Intention was 0.325 and justified 46.83% of the total effect size. Wei and Meng (2024) and Srimulyani and Hermanto (2021) similarly enhanced the explanatory power of research conclusions by building a causal path of 'abilities-motivation' in exploring the relationship between ability and intention. However, some studies in the field of food waste have reported the negative mediating role of motivation vis-à-vis the ability to purchase prepared foods (Jiao et al., 2022). This adverse outcome could be attributed to the fact that the ability factor of their study focused on cooking techniques and similar aspects in consumers. However, this study attends to the knowledge and skill levels, economic abilities and behavioural accessibility of consumers apropos prepared foods. This difference highlights the dynamic and complex nature of the relationships between ability, motivation and purchase intentions in discrete research contexts.

5.3 Further analysis of policy implications and strategic focus

In addressing the challenge of food waste reduction through the promotion of prepared food consumption, several strategies can be adopted by public authorities to support the transition towards sustainable consumption patterns. These strategies not only enhance consumer willingness to adopt prepared foods but also contribute to the broader goal of reducing food waste at the systemic level. This study innovatively proposes that the MOA theory provides a new policy perspective for addressing food waste issues.

5.3.1 Policy development and media advocacy: enhancing external opportunities and consumer purchase intentions

Government policy and media advocacy play critical roles in enhancing consumer purchase intentions for prepared foods, directly impacting food waste reduction. This perspective is consistent with existing research (Lorenz and Langen, 2017; Zenk et al., 2015). It is recommended that governments implement supportive policies such as tax incentives, subsidies, and the establishment of industry standards to foster the growth of the prepared food industry. These measures could stimulate innovation in technology and product quality, ultimately building consumer trust in the sector. Simultaneously, media campaigns can be a powerful tool in shaping consumer perceptions, which is in line with the research of Furst et al. (1996) and Long et al. (2023). By highlighting the convenience, nutritional benefits, safety, and food waste reduction potential of prepared foods, media outreach can foster positive consumer attitudes. Furthermore, showcasing successful industry cases, health-conscious eating trends, and environmental sustainability practices can further engage consumers, motivating them to adopt more sustainable consumption behaviours. This strategy underscores the need for an integrated approach, where policy and media work together to raise consumer awareness and support sustainable food systems.

5.3.2 Improving the health attributes of prepared foods: internal motivators for increased purchase intentions

The health attributes of prepared foods are a key factor influencing consumer willingness to purchase. This perspective is consistent with existing research (Fu et al., 2024; Dong et al., 2022). Given the increasing concerns about health, offering nutritionally balanced and additive-free products becomes a critical strategy for attracting consumers. Prepared food companies can respond by optimising product formulations, selecting high-quality ingredients, and employing advanced production techniques that meet both taste and health standards. Collaborating with health experts to introduce specific functional products—such as low-sugar, low-fat, and high-fibre options—can further enhance consumer trust and purchase intentions. This focus on health not only improves the appeal of

TABLE 4 Direct effect analysis.

Hypothesis	Path	Estimate	S.E.	C.R.	*p*
H1	Opportunity → Intention	0.160	0.043	3.695	***
H2	Ability → Intention	0.325	0.074	4.37	***
H3	Convenience → Intention	0.025	0.035	0.708	*
H4	Health → Intention	0.512	0.05	10.16	***

*$p < 0.5$; **$p < 0.01$; ***$p < 0.001$.

TABLE 5 Analysis of indirect effects.

Variables	Coefficient	Bootstrapping					
		Standardisation Error	Bias-corrected		Percentile		Two-tailed salience
	β	S.E.	Lower	Upper	Lower	Upper	*p*
Total effect							
Ability → Intention	0.694	0.105	0.490	0.904	0.484	0.898	**
Opportunity → Intention	0.312	0.091	0.131	0.481	0.135	0.490	**
Indirect effect							
Opportunity → Convenience → Intention	0.004	0.009	−0.008	0.03	−0.01	0.025	*
Opportunity → Health → Intention	0.148	0.061	0.044	0.277	0.043	0.276	**
Ability → Convenience → Intention	0.018	0.036	−0.053	0.09	−0.058	0.084	0.536
Ability → Health → Intention	0.351	0.056	0.259	0.49	0.237	0.463	*

TABLE 6 Multi-group analysis model fit.

	p	CMIN/DF	RMR	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA
Unconstrained	0	2.538	0.038	0.941	0.964	0.954	0.978	0.972	0.978	0.039
M1 Structural weights	0	2.503	0.045	0.94	0.963	0.955	0.978	0.972	0.978	0.039
Standard (Little, 1997)	<0.05	<3	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	<0.08

prepared foods but also addresses growing concerns about dietary habits, aligning with global trends towards healthier eating and sustainability.

5.3.3 Raising consumer cognition: a pathway to achieving rood waste reduction

A crucial pathway for reducing food waste through prepared food consumption lies in enhancing consumer awareness (Wu et al., 2024). Consumers must understand the basic attributes of prepared foods, including their convenience, health benefits, and appropriate storage techniques. Through consumer education, misconceptions and biases can be addressed, fostering a more comprehensive and objective understanding of these products. Educational efforts can take various forms, including school curricula, community programmes, and online platforms, all designed to cultivate awareness of healthy eating, environmental sustainability, and sustainable consumption practices. Additionally, teaching consumers how to select, store, and identify healthy prepared foods will enhance their confidence, making them more likely to incorporate prepared foods into their daily diets. This approach not only supports food waste reduction but also aligns with long-term sustainability goals.

6 Conclusion

This study focused on the issue of reducing food waste from the perspective of prepared foods consumption. Grounded in the Motivation-Opportunity-Ability (MOA) theory, the study employed Structural Equation Modeling (SEM) and utilised the Bootstrap self-sampling method. A random sample of 718 adult Chinese consumers was selected to investigate their purchase intentions regarding prepared foods. The direct effect results revealed that motivation, opportunity and ability significantly affect consumer purchase intentions towards prepared foods. Also, opportunity and ability can positively influence both convenience and health motivations. Policymakers and food companies could use this finding as their basis for optimising strategies to better satisfy consumer needs and drive sustainable growth in the prepared food market. The indirect effect results reinforced these results and revealed that motivation factors mediate the influencing mechanisms of opportunity and ability on purchase intentions in distinct ways. Robustness test results confirmed the universality of the hypothesis model with respect to different brand selection groups. Thus, the hypothesis model used for this study exhibited cross-brand selection invariance.

7 Limitations

Although this study provides valuable insights into consumer-driven prepared food consumption policies and reveals the mechanisms through which motivation, opportunity, and ability influence consumers' purchase intentions, several limitations remain. First, the results of this study are limited by our use of non-experimental cross-sectional data. Future studies can enhance the reliability and certainty of their research conclusions by utilising longitudinal data compiled as spatiotemporal series. Second, interactions could exist between the three latent variables of this study and exhibit complexities that were not comprehensively apprehended by the current model. Future studies should focus on interactions to further validate and refine the model constructed for this study. Third, the primary focus of this study is on consumer behaviour and the intention to consume prepared foods, without delving into the use of additives, waste generation, packaging materials, and their impact on sustainability in the production process of prepared foods. Future research could explore more comprehensive pathways for food waste reduction by integrating sustainability at both the consumer and production ends. Nevertheless, this study provides a framework based on the MOA theory, which can effectively guide policy design in the field of sustainable consumption behaviour and promote the sustainable development of the prepared food industry in reducing food waste.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

Ethics statement

The studies involving humans were approved by the Faculty Committee of Jiangsu Normal University (Protocol Ref#: JSNU-H2024CG-001). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

BH: Methodology, Writing – original draft, Writing – review & editing. YC: Formal analysis, Investigation, Writing – original draft. ZW: Conceptualization, Funding acquisition, Resources, Supervision, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. This paper was supported by National Social Science Project of China (grant no. 24CGL078).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Generative AI was used in the creation of this manuscript.

Publisher's note

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