Healthy Food Dining Strategies: A Study Focusing on Consumer Psychology and Behavioral Economics

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Abstract—**With the global proliferation of Online Food Delivery (OFD) platforms, their impact on public dietary structures has become increasingly significant. However, the complexity of the platform environment often leads consumers to make unhealthy choices. This study aims to apply classic theories from consumer psychology and behavioral economics to the digital context, constructing a systematic framework for healthy dining strategies. We propose a three-dimensional model encompassing "Digital Attention Guidance," "Multimodal Expectation Building," and "Dynamic Value Perception." The effectiveness of this model was tested through a simulated OFD platform randomized controlled trial involving 500 participants. The results indicate that a combined intervention integrating all three strategies was most effective, significantly reducing participants' mean total energy intake by 330 kcal ($p < 0.001$) compared to the control group, without compromising user satisfaction. Among single strategies, "Digital Attention Guidance" (e.g., optimizing default sorting) was the most efficient, while "Multimodal Expectation Building" (e.g., using high-quality images and descriptive language) played a key role in enhancing users' sensory expectations and satisfaction. This research confirms that by designing the digital choice architecture thoughtfully, OFD platforms can effectively "nudge" consumers toward healthier choices without harming business interests, providing empirical evidence and practical guidance for a win-win scenario between public health and commercial development.**

Keywords—Digital Nudging, Behavioral Economics, Choice Architecture, Online Food Delivery, Healthy Eating

I. INTRODUCTION

Growing global awareness of public health, together with the rising burden of chronic conditions, has pushed healthy eating to the center of public attention [1]. At the same time, digitalization has fundamentally altered consumption patterns. Online Food Delivery (OFD) services, valued for convenience and variety, have quickly become embedded in everyday life and now play an important role in shaping dietary intake [2]. Market evidence indicates that the OFD sector continues to scale worldwide; among younger users in particular, mobile ordering has become a dominant way to obtain meals [3]. Yet this convenience may carry health costs. Abundant options, dense promotional cues, and time-pressured decisions can steer users toward energy-dense foods high in fat, sugar, and calories, thereby increasing the likelihood of unhealthy diets [4]. In this context, identifying effective ways to encourage healthier choices within OFD interfaces is both theoretically meaningful and practically urgent.

Prior work in the restaurant domain shows that menus are influential decision aids, and that menu engineering can meaningfully shape preferences and purchasing behavior [5]. Drawing on consumer psychology and behavioral economics, these approaches “nudge” diners through mechanisms such as strategic item placement, appealing descriptions, and price anchoring to promote targeted dishes or higher-margin items [6]. However, it remains unclear whether findings derived from paper-based, in-store menus translate directly to digital ordering interfaces, which differ substantially in interaction patterns, information structure, and user experience. Systematic evidence on this transferability is still limited.

Research on digital settings is beginning to address this gap. Scholars have examined how online “choice architecture” affects food selection and have provided initial support for “digital nudging” as a means to foster healthier purchasing [7]. Examples include reordering items by default, applying traffic-light nutrition labels, and offering immediate feedback about healthier options, each of which can raise exposure to—and selection of—healthier foods [8, 9]. Nonetheless, three constraints persist. First, many studies emphasize short-lived outcomes of single nudges rather than evaluating coordinated, multi-strategy designs. Second, a substantial portion of the evidence comes from laboratory or simulated contexts, so generalizability to real OFD platforms remains uncertain. Third, how to combine platform-specific, dynamic features (e.g., personalized recommendations, user reviews, time-limited discounts) with established psychological mechanisms to create more effective guidance systems is still underexplored.

Accordingly, this study seeks to integrate classic theories from consumer psychology and behavioral economics with the distinctive properties of OFD platforms, and to develop a digital-oriented framework for promoting healthy dining choices. We focus on three key dimensions — Digital Attention Guidance, Multimodal Expectation Building, and Dynamic Value Perception — and translate them into actionable interface and information-design strategies. Their effectiveness will be examined via a controlled simulation experiment. Beyond offering platform managers a set of health-oriented tools that can reconcile business goals with social responsibility, this work also aims to extend behavioral-economics applications in digital consumption contexts.

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II. LITERATURE REVIEW

This study builds on the intersection of consumer psychology and behavioral economics, centering on Nudge theory and the broader notion of Choice Architecture, and applies these perspectives to healthy-choice design on Online Food Delivery (OFD) platforms.

A. Selecting a Template

Within traditional restaurants, menus function not only as information displays but also as subtle marketing instruments that shape what customers choose. Seminal work by Wansink and colleagues synthesizes menu-engineering tactics that can increase sales of targeted items, including healthier or higher-margin offerings [5]. These tactics leverage cognitive biases and heuristic decision-making, and can be organized into three components:

Attention Guidance: Because attention is scarce, where an item appears matters. Evidence suggests that visually salient zones — such as page corners and list endpoints — receive disproportionate gaze and can improve the likelihood that items placed there are noticed and purchased [10].

Expectation Management: Anticipated experience affects both choice and satisfaction. Using vivid, sensory, and imaginative descriptions (e.g., replacing a plain label with a richer, evocative name) can boost perceived attractiveness, raise sales by as much as 27%, and improve post-consumption evaluations [11].

Value Perception: Price presentation shapes value judgments. Anchoring, a well-known behavioral-economics effect, is often operationalized by including a high-priced reference item so that other options appear more reasonably priced and thus more appealing [12].

B. Choice Architecture and Health Nudges in the Digital Environment

As OFD grows, choice architecture has shifted from paper menus to screen-based interfaces. Digital systems can reproduce the same drivers — attention, expectations, and value — while also adding interactive capabilities that broaden the scope for Digital Nudging [7]. Recent work has assessed whether such nudges can improve online dietary quality. In a systematic review of 22 randomized controlled trials, Ge et al. report that interventions including nutrition labeling, enhanced accessibility of healthier products, framing, and priming can measurably improve diet quality [7]. Among these, nutrition labels (e.g., calorie displays and traffic-light indicators) and accessibility manipulations (e.g., listing healthier items earlier) are both common and consistently effective. A randomized trial by Bianchi et al. using a simulated OFD interface further highlights position effects: presenting lower-energy restaurants and dishes first reduced the total energy content of final selections [4].

C. Research Gaps and the Positioning of This Study

Despite advances, several issues remain unresolved. First, most studies isolate one or a small set of nudges, whereas real OFD interfaces operate as complex environments in which ratings, reviews, sales cues, discounts, and recommendation tags jointly shape decisions. A unified framework is therefore needed to integrate multiple nudges and examine whether they reinforce or undermine one another. Second, because many findings come from tightly controlled simulations, their relevance to commercial platforms — characterized by competitive offerings and algorithm-driven recommendations — requires further validation. Third, Wansink ’ s classic three-part structure (attention, expectation, value) has not been fully re-theorized for digital contexts.

To address these gaps, we connect foundational theory with digital practice by updating Wansink et al.’ s three-step menu-engineering logic and proposing a three-dimensional Digital Healthy Dining Strategy framework for OFD platforms: Digital Attention Guidance, Multimodal Expectation Building, and Dynamic Value Perception.

III. METHODOLOGY

To systematically examine how to promote healthier choices on Online Food Delivery (OFD) platforms, this study revises and expands Wansink et al. ’ s classic menu engineering framework [5] and develops a three-dimensional model tailored to digital ordering contexts. The model is designed to generate an integrated set of Digital Nudging interventions by targeting critical psychological phases within users’ decision-making.

A. Theoretical Framework: Digital Healthy Dining Strategy Model

The proposed framework comprises three interrelated dimensions: Digital Attention Guidance, Multimodal Expectation Building, and Dynamic Value Perception.

Digital Attention Guidance: This dimension seeks to shift users from routine scrolling to deliberate evaluation by refining interface structure and information display so that healthier options become more noticeable. Key tactics include positional primacy, enhanced visual salience, and category re-engineering.

Multimodal Expectation Building: This dimension focuse s on strengthening appetitive expectations for healthy items a nd countering the common assumption that “healthy” equ ates to “less enjoyable.” Core strategies involve sensory-o riented descriptions, high-quality imagery, and social proof c ues.

Dynamic Value Perception: This dimension aims to incre ase the perceived benefits of healthy foods while reducing th e psychological and practical costs of selecting them through adaptive pricing and promotion mechanisms. Representative approaches include price anchoring and bracketing, incentive bundling, and non-monetary rewards(Figure 1).

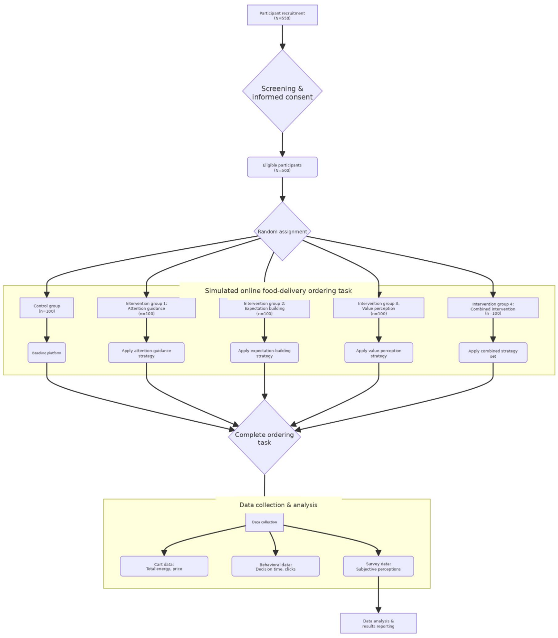

Fig. 1. Experimental Design and Procedure Flowchart

- Participants: We recruited 500 eligible adults through an online panel. All participants provided informed consent. Inclusion criteria were: (1) age ⩾ 18; (2) at least one use of an online food delivery (OFD) service within the past three months; and (3) successful completion of an attention check during screening. Screening occurred prior to randomization; thus, all enrolled participants met the analytic eligibility requirements.
- Experimental Platform: A lightweight, highly controllable simulated OFD ordering interface was developed for the experiment. The system included standardized restaurant and menu pages, item cards, and a cart/checkout page. It was optimized for behavioral measurement (e.g., item choices, basket totals, and task duration) rather than commercial deployment, thereby lowering implementation costs and improving replicability.
- Experimental Groups: Participants were randomly allocated to one of five conditions: Control, Attention Guidance, Expectation Building, Value Perception, or Combined Intervention.
- Procedure: Participants were asked to place a lunch order for themselves under a standardized scenario (weekday lunch, single diner). The menu set was identical across all conditions; only interface and nudge elements varied by group assignment. Participants could browse freely, add items to the cart, and finalize the order upon completion.
- Data Collection: We recorded (1) total basket energy (kcal), calculated as the sum of item-level energy values; (2) the share of healthy items selected, determined using a pre-specified nutrition-labeling rule applied uniformly to all items; (3) total expenditure; (4) decision time; and (5) subjective evaluations. Item-level energy values and healthy-item labels were prepared in advance using a standardized nutrition reference and a consistent coding protocol.
- Data Analysis: Between-condition differences were tested using one-way ANOVA, followed by Tukey's HSD for post hoc pairwise comparisons, in line with the pre-registered analysis plan for a five-condition between-subjects design.

IV. Results

This section presents the results based on N = 500 eligible participants who completed the study after passing screening. To ensure balanced group sizes, we used blocked random assignment with a fixed allocation ratio of 1:1:1:1:1 (100 participants per condition).

A. Participant Baseline Characteristics

As shown in Table I, baseline characteristics were comparable across conditions, with no evidence of meaningful imbalance across key demographics and OFD usage frequency.

TABLE I. Baseline Characteristics of Participants by Experimental Group

Experimental Group	Sample Size (n)	Age (Mean ± SD)	Gender (M/F)	Weekly OFD Freq. (Mean ± SD)
Control	100	27.5 ± 5.0	60/40	3.3 ± 1.0
Attention Guidance	100	28.0 ± 5.2	53/47	3.3 ± 1.0
Expectation Building	100	28.4 ± 4.2	58/42	3.5 ± 1.0
Value Perception	100	27.9 ± 4.8	55/45	3.4 ± 1.1
Combined Intervention	100	28.4 ± 5.1	62/38	3.5 ± 1.1

B. Impact on Primary Outcome: Total Energy Intake

The primary outcome was the total energy (kcal) in the participants' final shopping baskets. As shown in Figure 2, there was a significant difference in mean total energy across the groups ($F(4, 495) = 25.8$, $p < 0.001$, $\eta^2 = 0.17$).

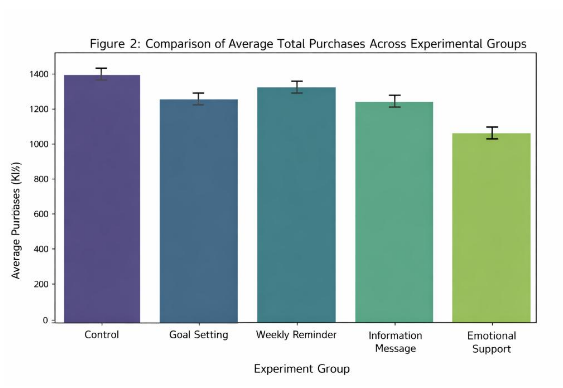

Fig. 2. Comparison of Mean Total Energy in Shopping Basket Across Experimental Groups

The Combined Intervention group showed the most significant effect, reducing mean energy intake to 1055 kcal, a 330 kcal reduction compared to the control group (1385 kcal). Post-hoc comparisons (Figure 3) confirmed that the Combined Intervention group was significantly different from all other groups(Table II).

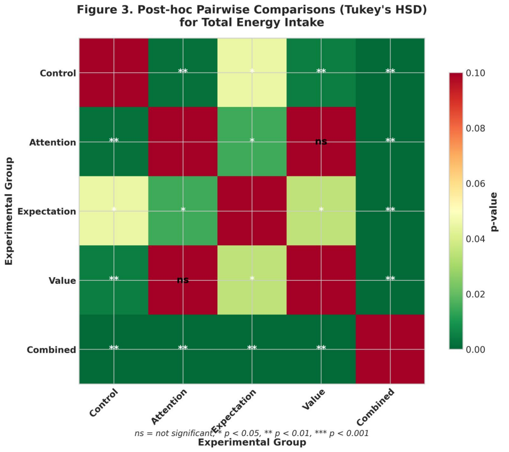

Fig. 3. Post-hoc Pairwise Comparisons (Tukey's HSD) for Total Energy Intake

TABLE II. SUMMARY STATISTICS FOR PRIMARY OUTCOME VARIABLE BY EXPERIMENTAL GROUP

Experimental Group	Mean Total Energy (kcal)	SD	Difference from Control	p-value
Control	1385	150	-	-
Attention Guidance	1215	140	-170	< 0.01
Expectation Building	1310	150	-75	< 0.05
Value Perception	1240	145	-145	< 0.01
Combined Intervention	1055	130	-330	< 0.001

C. *Impact on Secondary Outcomes*

We further analyzed the impact of each intervention on secondary outcome measures including healthy food selection proportion, total spending, and decision time.

Healthy Food Selection Proportion: As shown in Figure 4, the interventions significantly increased the proportion of healthy foods selected ($F(4, 495) = 18.9$, $p < 0.001$). The Combined Intervention group had the highest proportion at 45%, compared to 18% in the control group.

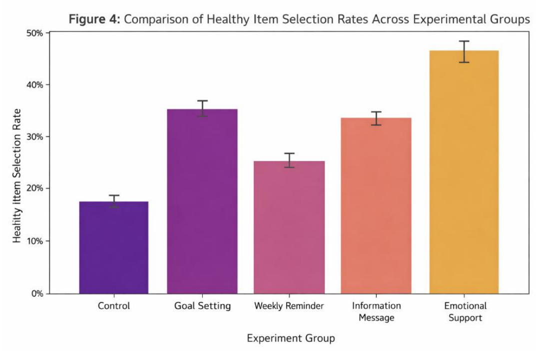

Fig. 4. Comparison of Healthy Food Selection Proportion Across Experimental Groups

Total Spending: There was a significant difference in spending ($F(4, 495) = 8.2$, $p < 0.001$). The Value Perception group had significantly lower spending due to bundled discounts (Figure 5).

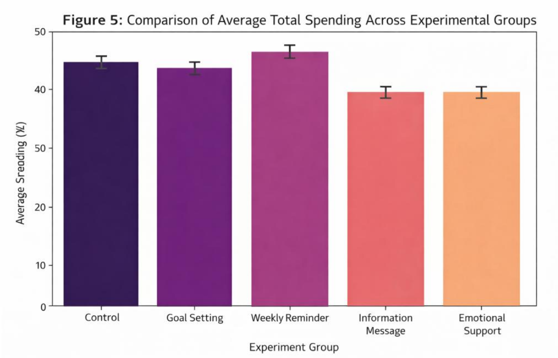

Fig. 5. Comparison of Mean Total Spending Across Experimental Groups

Decision Time: There was a significant difference in decision time ($F(4, 495) = 5.6$, $p < 0.001$). The Attention Guidance and Combined Intervention groups had the shortest decision times, while the Expectation Building group had the longest (Figure 6)(Table III).

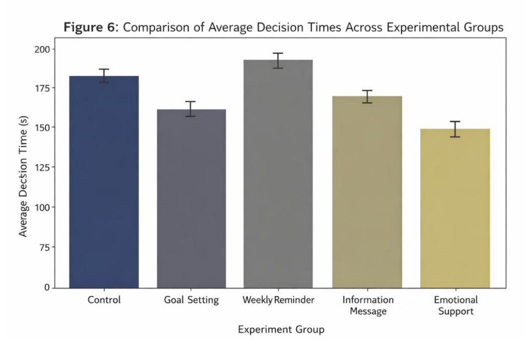

Fig. 6. Comparison of Mean Decision Time Across Experimental Groups

TABLE III. SUMMARY STATISTICS FOR SECONDARY OUTCOME VARIABLES BY EXPERIMENTAL GROUP

Experimental Group	Healthy Food Proportion (%)	Mean Spending (CNY)	Decision Time (s)
Control	18	45	180
Attention Guidance	35	43	150
Expectation Building	22	47	200
Value Perception	32	38	170
Combined Intervention	45	40	140

D. *Subjective Perception Ratings*

After completing the ordering task, participants rated their experience on a 7-point Likert scale. As shown in the radar chart (Figure 7), the Expectation Building and Combined Intervention groups scored highest on "Expected Tastiness." The Value Perception and Combined Intervention groups scored highest on "Perceived Value." Importantly, choice satisfaction did not decrease in the intervention groups, and platform usability was highest in the Attention Guidance and Combined groups.

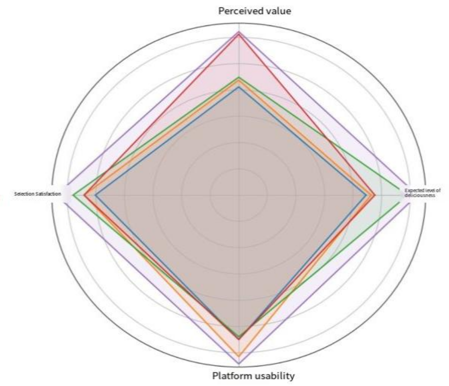

Fig. 7. Subjective Perception Ratings Across Experimental Groups (7-point Likert Scale)

- Expected Tastiness: The "Expectation Building" and "Combined Intervention" groups scored highest, significantly higher than the other three groups, demonstrating the effectiveness of multimodal information in enhancing appetite expectations.
- Perceived Value: The "Value Perception" and "Combined Intervention" groups scored highest, indicating that discount bundles and point incentives successfully enhanced users' perceived value of healthy foods.
- Selection Satisfaction: Although all intervention groups received varying degrees of "nudging," their selection satisfaction did not significantly decrease compared to the control group, and the "Combined Intervention" group even showed a slight increase. This indicates that well-designed nudge strategies can guide healthy choices without sacrificing user experience.
- Platform Usability: The "Attention Guidance" and "Combined Intervention" groups scored highest on usability, consistent with the decision time data, once again demonstrating the importance of good information architecture.

V. DISCUSSION

This study finds that the integrated Combined Intervention is the most effective approach for encouraging healthier selections on OFD platforms. The result implies a synergistic mechanism in which multiple nudges jointly influence different stages of decision-making. Specifically, attention guidance increases the likelihood that healthy options enter consideration, expectation-building strengthens their anticipated appeal, and value-based cues reduce resistance by improving perceived cost–benefit trade-offs.

Second, Digital Attention Guidance emerges as a foundat ional lever, highlighting the strength of default-oriented desi gn in digital environments. This pattern is consistent with est ablished evidence on default effects in behavioral economics [6] and indicates that the menu “position effect” document ed in offline settings [10] generalizes to screen-based orderin g interfaces.

Third, Dynamic Value Perception acts as a robust behavioral driver, underscoring the effectiveness of economic framing. The observed reductions in both total energy and spending within the Value Perception condition suggest that users are sensitive to deal structures—such as bundles and framed discounts — when these are tied to healthier items.

Finally, Multimodal Expectation Building appears to operate in a more indirect manner. Rather than strongly shifting choices on its own, it primarily improves the user experience and helps counter the belief that healthy food is inherently less palatable. Although this component produced the smallest standalone decrease in energy, it supported satisfaction outcomes and may therefore be important for sustaining interventions over time.

Overall, these findings extend prior work by showing that a comprehensive, multi-dimensional nudge framework can be effective in a digital consumption setting. From an applied perspective, the results offer OFD platform designers a data-informed set of strategies to advance public-health objectives while remaining compatible with commercial performance.

VI. CONCLUSION

This study systematically investigated the application of consumer psychology and behavioral economics to promote healthy eating on OFD platforms. We conclude that a combined nudge strategy is most effective, that default positioning is a key driver of choice, and that a well-designed choice architecture can create a win-win for public health and business.

A. *Limitations and Future Directions*

This study was conducted in a simulated environment, so future research should aim to validate these findings in real-world field experiments. The sample may not be fully representative of all OFD users, and the long-term effects of these nudges are unknown. A significant avenue for future research is the exploration of personalized nudging, which leverages user data to deliver tailored interventions.

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AVAILABILITY OF DATA

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AUTHOR CONTRIBUTIONS

Haoqian Chen: Conceptualization; Methodology; Investigation; Writing – original draft; Project administration.

Jinling Liang: Software; Data curation; Formal analysis; Validation; Visualization; Writing – review & editing.

Wenhui Zhao: Supervision; Resources; Methodology (supporting); Writing – review and editing.

COMPETING INTERESTS

The authors declare no competing interests.