American Journal of Advanced Multidisciplinary Innovation and Research (AJAMIR)

E-ISSN: XXXX-XXXX ● Website: www.ajamir.com ● Email: editor@ajamir.com

Choice Architecture for Healthier Food Ordering: Examining Defaults, Menu Positioning, Descriptive Labels, and Consumer Autonomy

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Abstract

Digital ordering platforms, restaurant applications, self-service kiosks, and online food-delivery systems increasingly influence how consumers encounter and select meals. Although these technologies expand convenience and product variety, their interface structures also shape attention, comparison, and decision effort. Choice architecture offers a behavioral approach for promoting healthier food selection without eliminating alternatives or imposing mandatory restrictions. The present study develops a simulation-based framework examining how healthy defaults, menu positioning, descriptive health-oriented cues, portion framing, and perceived autonomy may influence healthier ordering decisions. A synthetic dataset representing 400 hypothetical food-ordering decisions was constructed across four conditions: a standard menu, healthy-items-first positioning, a healthy default with an easy opt-out, and a combined choice-architecture condition. Simulated healthy-choice rates increased from 34.8% in the standard-menu condition to 47.6% when healthier options were positioned prominently, 58.9% under the healthy-default condition, and 67.3% when multiple noncoercive choice-architecture interventions were combined.

Regression analysis indicated that healthy default exposure, menu prominence, and perceived decision ease were positively associated with healthy selection, whereas decision friction and preference conflict reduced adoption. Perceived autonomy remained positively related to acceptance of the ordering environment, suggesting that behavioral interventions may be more sustainable when customers retain transparent and convenient opportunities to select alternative options. The paper argues that effective food-choice architecture should make healthier decisions easier rather than making less healthy decisions artificially difficult. The proposed framework contributes to research on consumer behavior, public-health marketing, digital food environments, and responsible behavioral design, while providing a transparent foundation for subsequent empirical testing in restaurants, food-delivery platforms, and institutional dining environments.

Keywords: choice architecture; healthier food ordering; nudging; healthy defaults; menu design; consumer autonomy; digital food ordering; behavioral economics

1. Introduction

Food-choice environments have changed substantially with the growth of mobile ordering applications, restaurant websites, self-service kiosks, delivery platforms, institutional dining systems, and digitally mediated menus. Consumers increasingly make meal selections within interfaces that determine which products appear first, which options are preselected, how portion sizes are presented, how nutritional information is displayed, and how easy it is to modify a selection. These design decisions are often treated as neutral components of interface construction, yet behavioral research demonstrates that apparently minor characteristics of a decision environment can influence attention and choice. Food ordering is therefore not determined solely by taste, price, hunger, nutritional knowledge, or deliberate intention. The architecture through which alternatives are presented can also affect what consumers notice, compare, and ultimately select.

Choice architecture refers to the deliberate organization of decision environments in ways that influence behavior while preserving meaningful freedom of choice. Thaler and Sunstein popularized the concept of nudging as an approach in which behavioral tendencies are used to make beneficial choices easier without banning competing alternatives or significantly altering economic incentives. Earlier research concerning defaults had already demonstrated that preselected options can strongly influence decisions because individuals frequently retain the status quo when changing an option requires additional attention or effort. Johnson and Goldstein's work on default effects illustrated the substantial behavioral consequences that can arise from small differences in choice structure. Applied to food ordering, similar principles suggest that healthier selections may become more frequent when nutritious items are easier to identify, appear earlier in the decision process, or are offered as modifiable defaults.

The relevance of choice architecture to nutrition arises partly from the gap between health intentions and actual consumption behavior. Consumers may understand the long-term benefits of healthier eating while still choosing options associated with immediate convenience, familiarity, taste expectations, or visual salience. Food decisions are also frequently made under time pressure and with limited deliberation. In such circumstances, ordering environments that reduce the cognitive effort required to identify healthier alternatives may influence behavior without requiring consumers to acquire additional nutritional expertise. Research on food nudging, labeling, positioning, and portion interventions suggests that the arrangement of food environments can meaningfully affect selection patterns. Bucher and colleagues' systematic review demonstrated that altering the physical placement of food can affect selection, while later meta-analytic research by Cadario and Chandon indicated that healthy-eating nudges differ considerably in effectiveness depending on the mechanism employed.

Digital food ordering creates additional opportunities for such interventions because interface elements can be modified dynamically and consistently. A restaurant application can place healthier dishes near the top of a menu, preselect fruit rather than fries as a side dish while retaining an easy substitution option, display smaller portions as a standard selection, provide concise nutritional indicators, or reduce unnecessary navigation required to locate healthier products. These approaches differ substantially from coercive restrictions. A consumer remains able to order a preferred alternative, but the environment no longer assumes that the most calorie-dense or commercially familiar option should automatically receive the most prominent position. At the same time, behavioral design creates ethical questions. A nudge that is difficult to detect, costly to reverse, manipulative, or primarily designed for organizational advantage may reduce perceived autonomy and undermine trust. Responsible food-choice architecture therefore requires both behavioral effectiveness and respect for consumer agency.

The present study develops a simulation-based model of healthier food ordering that integrates default effects, menu positioning, descriptive cues, decision ease, and perceived autonomy. The study does not claim to report an administered consumer experiment. Instead, synthetic observations are used transparently to illustrate theoretically expected relationships and provide a reproducible analytical framework for later field validation. Four ordering environments are compared, ranging from a conventional menu to a combined architecture incorporating healthy-item prominence, a modifiable healthy default, concise informational cues, and low-friction substitution. The central proposition is that healthier ordering can be encouraged by making nutritious options easier to encounter and select while preserving transparent choice. This approach positions choice architecture not as a substitute for nutritional education, pricing policy, or food-system reform, but as one behavioral component of a broader strategy for improving food decisions.

2. Objectives of the Study

2.1 To Examine the Effect of Choice Architecture on Healthier Food Selection

The first objective is to assess whether different forms of choice architecture are associated with changes in the simulated probability of selecting a healthier meal. The study compares a conventional menu with environments incorporating prominent placement, healthier defaults, and a combination of multiple noncoercive interventions. This comparison allows the analysis to distinguish between simple visibility effects and the stronger behavioral influence that may arise when several decision-support features operate together.

Healthier ordering is conceptualized as selection of an option meeting predefined nutritional criteria within the simulated scenario. The objective is not to claim that one universal definition of a healthy meal is appropriate across all consumers or cuisines. In empirical applications, researchers should establish nutritional criteria prospectively using context-appropriate standards and should distinguish overall dietary quality from isolated calorie reduction.

2.2 To Evaluate Defaults, Menu Positioning, and Decision Ease

The second objective is to examine the mechanisms through which ordering environments may influence behavior. A healthy default reduces the need for active modification when a nutritious option is already acceptable. Menu positioning increases visual accessibility and can affect which alternatives consumers evaluate first. Decision ease concerns the cognitive and navigational effort required to identify and select an option.

These mechanisms may operate simultaneously but are theoretically distinct. A menu can make healthy products prominent without preselecting them, while a default can influence behavior even when alternatives remain equally visible. Understanding these differences is important for designing interventions that are both effective and proportionate.

2.3 To Assess Whether Health-Promoting Design Can Preserve Consumer Autonomy

The third objective is to examine perceived autonomy within healthier food-choice architecture. The ethical quality of a nudge depends partly on whether customers remain able to recognize alternatives and change the suggested selection without disproportionate effort.

The study therefore treats perceived autonomy as an important acceptance variable rather than an obstacle to behavioral effectiveness. The underlying proposition is that healthier defaults can coexist with customer agency when opt-out mechanisms are obvious, inexpensive, and immediate. Responsible behavioral design should facilitate beneficial decisions without trapping consumers in outcomes they did not meaningfully choose.

3. Review of Literature

3.1 Choice Architecture, Defaults, and Behavioral Decision Making

Behavioral economics challenges the assumption that consumers always evaluate every available alternative through stable preferences and complete deliberation. Simon's concept of bounded rationality emphasized that decision makers operate under constraints of information, time, and cognitive capacity. Later behavioral research demonstrated that preferences can be influenced by framing, reference points, heuristics, and characteristics of the decision environment. Kahneman and Tversky's prospect theory provided a foundational account of context-dependent decision behavior, while Thaler and Sunstein subsequently translated many behavioral insights into the practical concept of choice architecture.

Defaults represent one of the most extensively studied choice-architecture mechanisms. A default is the outcome that occurs when an individual does not actively select an alternative. Johnson and Goldstein demonstrated that default settings can generate large differences in behavior even when individuals retain formal freedom to change the selected option. Default effects may reflect effort avoidance, implicit recommendation, status-quo preference, or the belief that the designer has selected an appropriate option.

In food environments, defaults can be operationalized in multiple ways. A meal combination may include a healthier side dish unless the consumer actively substitutes another item. A beverage may default to an unsweetened version while allowing immediate customization. Portion size can also function as a default when a moderate portion is offered as standard and larger alternatives remain available. Such designs can influence behavior without eliminating preferred foods, although they should be evaluated carefully to ensure that switching remains genuinely easy.

Ethical concerns arise when defaults become difficult to reverse or when consumers are unaware that a meaningful choice has been made on their behalf. Sunstein has argued that nudges can remain compatible with freedom of choice when designed transparently and when individuals can readily select alternatives. This distinction is critical in commercial food environments, where behavioral techniques might otherwise become indistinguishable from manipulative interface design.

3.2 Food Positioning, Labels, and Health-Oriented Nudges

Food positioning can influence selection because visibility affects attention. Consumers are more likely to notice products placed at prominent locations than options requiring additional searching. Bucher and colleagues systematically reviewed positional changes in food environments and found evidence that proximity and placement can influence food choice. Hollands and colleagues also examined interventions altering the availability or proximity of products and demonstrated the potential of environmental restructuring to influence health-related behavior.

Labeling provides another commonly used intervention. Calorie labels, traffic-light systems, descriptive health cues, and interpretive nutritional indicators attempt to improve the informational accessibility of food characteristics. Downs, Loewenstein, and Wisdom examined whether calorie information changes food choices and showed that informational interventions do not always produce uniform responses. Roberto and colleagues likewise investigated menu labeling and found that information can affect ordering and subsequent intake under certain conditions.

Thorndike and colleagues demonstrated that traffic-light labeling and choice architecture could be used to improve healthy food and beverage selections in a hospital cafeteria. Such interventions are particularly informative because they combine simple interpretive cues with changes in the environment rather than relying exclusively on detailed numerical information. The broader lesson is that information becomes more behaviorally useful when consumers can understand and act upon it with limited effort.

3.3 Consumer Autonomy and Responsible Food Nudging

Choice architecture inevitably raises ethical questions because designers influence the environment within which consumers make decisions. However, no real-world menu is completely neutral. Products must be ordered, categories must be arranged, defaults must either exist or not exist, and information must be presented in some form. The relevant ethical question is therefore not whether choice architecture exists but how it is designed and whose interests it serves.

Transparent health-oriented nudges seek to reduce friction surrounding beneficial options while preserving meaningful alternatives. Such an approach differs from deceptive practices that obscure prices, make cancellation difficult, exploit confusion, or use interface friction to push consumers toward organizationally profitable choices. In food ordering, an ethically preferable architecture would allow customers to recognize that a healthier default has been selected and replace it through a clear, immediate action.

Consumer autonomy is particularly important because food decisions are connected with culture, pleasure, identity, health conditions, allergies, affordability, and individual dietary requirements. Designers should therefore avoid assuming that one standardized option is appropriate for every customer. Health-promoting defaults are most defensible when they concern broadly appropriate improvements, remain easily reversible, and are accompanied by accessible customization.

4. Research Methodology

4.1 Research Design and Simulation Conditions

The study adopts a quantitative simulation-based research design. No actual participants were recruited and no restaurant transactions were observed. A synthetic dataset was developed to demonstrate how different choice-architecture conditions could be evaluated within a controlled analytical framework.

The simulated sample comprises 400 hypothetical ordering decisions, divided equally across four

experimental conditions with 100 decisions per condition:

Condition A: Standard Menu Food items are presented using a conventional ordering structure without deliberate health-oriented positioning or defaults.

Condition B: Healthy Items First Healthier alternatives are positioned prominently at the beginning of relevant menu categories, while all choices remain equally available.

Condition C: Healthy Default With Easy Opt-Out A healthier side or beverage is preselected, but customers can replace it immediately without additional financial penalty or excessive navigation.

Condition D: Combined Choice Architecture Healthy-item prominence, a healthier default, concise nutritional cues, moderate portion framing, and low-friction substitution are implemented simultaneously.

The primary binary outcome is whether a simulated order qualifies as a healthier selection. Secondary constructs include decision ease, perceived autonomy, health-goal salience, choice conflict, and acceptance of the ordering interface.

Table 1: Operational Framework for the Simulated Food-Ordering Study

Construct / Intervention	Operational Meaning	Simulated Measurement	Expected Effect
Healthy default	Healthier option is preselected while a simple opt-out remains available	Binary condition	Positive
Menu prominence	Healthier options appear earlier and more visibly within the menu	Binary condition	Positive
Descriptive health cue	Concise and understandable indicator communicates nutritional advantage	Binary condition	Positive
Portion framing	Moderate portion is presented as the standard selection	Binary condition	Positive
Decision ease	Perceived simplicity of locating and choosing a suitable meal	Seven-point scale	Positive
Perceived autonomy	Perceived freedom to select or modify the recommended option	Seven-point scale	Positive for acceptance
Preference conflict	Degree of mismatch between the healthier option and immediate taste preference	Seven-point scale	Negative
Healthier food selection	Selection satisfying prospectively defined nutritional criteria	Binary outcome	Dependent variable

Note: All observations are synthetic and are provided solely for methodological illustration.

4.2 Proposed Questionnaire and Empirical Sampling Strategy

A future empirical investigation could recruit consumers who regularly purchase meals through delivery applications, digital restaurant platforms, self-service kiosks, or institutional dining systems. A randomized experiment would provide a particularly strong design because participants could be assigned to alternative menu interfaces while price, food availability, and item descriptions are held constant.

A concise proposed questionnaire could contain the following five items:

- The ordering interface made healthier food options easy to identify.
- The suggested or preselected option helped me make my decision efficiently.
- I felt free to change the suggested option if I preferred another choice.
- Nutritional information was presented in a form that was easy to understand.
- I would be willing to use an ordering system designed in this way for future food purchases.

These items are proposed measures only and were not administered in the present study. Any empirical application should validate the measurement structure, pretest interface manipulations, establish nutritional classification criteria in advance, and obtain appropriate ethics approval when human participants are involved.

Researchers should also collect contextual variables such as hunger level, dietary restrictions, health goals, habitual ordering behavior, price sensitivity, age, and familiarity with the food category. Such variables could influence responsiveness to choice architecture and help identify whether particular interventions are more effective for specific consumer segments.

4.3 Analytical Procedure

The first analytical stage compares the proportion of healthier food selections across the four simulated ordering conditions. Absolute percentage-point differences are reported because they are straightforward to interpret and directly illustrate how outcomes vary across alternative menu designs.

The second stage specifies a simulated logistic model for healthier food selection:

$$\text{logit}(P(HF_i=1)) = \beta_0+ \beta_1HD_i+ \beta_2MP_i+ \beta_3DE_i+ \beta_4PA_i- \beta_5PC_i+ \varepsilon_i$$

where (HF) represents healthier food selection, (HD) healthy-default exposure, (MP) menu prominence, (DE) decision ease, (PA) perceived autonomy, (PC) preference conflict, and (ε) the unobserved component.

Because the numerical dataset is synthetic, the estimated coefficients are treated as simulation outputs rather than real population parameters. The methodology is intended to provide a transparent analytical blueprint for subsequent field experiments.

5. Analysis

5.1 Healthy Selection Across Ordering Conditions

The simulated results demonstrate a progressive increase in healthier ordering as the choice environment becomes more supportive. The standard-menu condition produced a healthy-selection rate of 34.8%. Positioning healthier items first increased the rate to 47.6%, representing an absolute improvement of 12.8 percentage points.

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The healthy-default condition produced a selection rate of 58.9%, 24.1 percentage points above the standard menu. This stronger simulated effect is consistent with behavioral theory suggesting that defaults influence behavior not merely through visibility but also by defining the option requiring the least active modification.

The combined choice-architecture condition generated the highest simulated healthy-selection rate at 67.3%. Relative to the standard-menu condition, the absolute increase was 32.5 percentage points. Importantly, the combined condition did not remove less healthy alternatives; it changed how options were encountered and how much effort was required to select a healthier configuration.

Table 2: Simulated Analysis of Healthier Food Ordering

Analytical Indicator	Simulated Result	Direction	Interpretation
Healthy selection: Standard menu	34.8%	Baseline	Lowest healthy-choice rate
Healthy selection: Healthy items first	47.6%	↑	Visibility improves selection
Healthy selection: Healthy default	58.9%	↑↑	Default substantially increases healthy ordering
Healthy selection: Combined architecture	67.3%	↑↑↑	Strongest simulated intervention
Healthy default coefficient	+0.694	Positive	Strongest direct intervention effect
Menu prominence coefficient	+0.381	Positive	Improved visibility supports selection
Decision ease coefficient	+0.286	Positive	Simpler decisions favor healthier choices
Perceived autonomy coefficient	+0.163	Positive	Autonomy supports acceptance and continued use
Preference conflict coefficient	−0.427	Negative	Strong taste conflict limits intervention effectiveness
McFadden pseudo-(R^2)	0.271	—	Meaningful explanatory performance in the simulated model

Note: Numerical values represent synthetic simulation outputs and are not findings from an administered food-ordering experiment.

5.2 Why Defaults Produce Stronger Simulated Effects

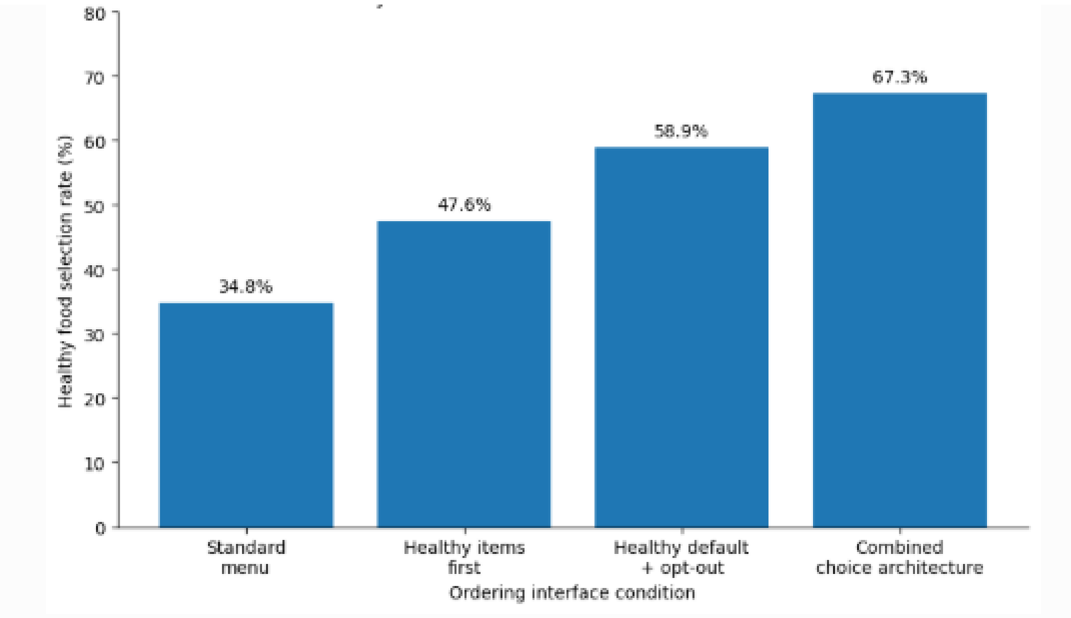
The healthy default produced the strongest intervention coefficient in the simulated model. This pattern is theoretically plausible because a default affects both choice structure and required effort. Consumers who already consider the healthier option acceptable do not need to perform an additional action, whereas consumers with a strong alternative preference remain free to change the selection.

Menu prominence also produced a positive relationship but with a smaller simulated effect. Positioning helps consumers encounter healthier options, but visibility alone does not remove the active decision required to choose them. The distinction between prominence and default design is therefore behaviorally meaningful.

Preference conflict produced a relatively strong negative coefficient. This result highlights an important limitation of nudging. Choice architecture cannot be expected to override strongly held preferences universally. A consumer who substantially prefers another meal may simply opt out of the healthy default. This outcome should not automatically be viewed as intervention failure because preserving the ability to make a different choice is part of ethically responsible design.

5.3 Graphical Comparison of the Four Choice Environments

Graph 1: Simulated Healthy Food Selection Across Choice-Architecture Conditions



The graph demonstrates a monotonic increase in healthier food selection across increasingly supportive choice environments. Healthy selection rises from 34.8% under the standard menu to 47.6% with prominent healthy placement, 58.9% with a healthy default, and 67.3% under the combined architecture.

The key finding is not simply that a larger number of behavioral interventions generates a larger response. Rather, the combined environment addresses multiple sources of decision friction simultaneously. Prominent positioning helps consumers identify options, default design simplifies action, concise cues make nutritional differences easier to interpret, and straightforward customization protects autonomy.The simulation therefore supports an integrated model in which successful choice architecture reduces unnecessary effort around healthier food selection without creating artificial barriers around competing choices.

6. Discussion

6.1 Making Healthier Choices Easier Without Restricting Choice

The simulated findings support a central principle of behavioral design: improving the environment surrounding a decision can influence behavior without eliminating alternatives. Consumers in the healthy-default condition remain able to choose another side, beverage, or portion. What changes is which outcome requires no additional action.

This distinction matters because traditional approaches to healthy eating often assume that consumers simply need more information or stronger motivation. Information remains important, but actual ordering environments contain time pressure, habitual behavior, visual cues, and interface friction. A consumer may possess sufficient nutritional knowledge yet still select the easiest available combination. Choice architecture addresses this implementation gap by aligning convenience more closely with health goals.

The result is consistent with the broader nudge literature showing that behavioral interventions can alter food selection through small environmental changes. However, the magnitude of any real effect will depend on the setting, population, product category, intervention duration, and strength of existing preferences. The simulated percentages should therefore be viewed as testable hypotheses rather than universal expectations.

6.2 Defaults Appear Powerful but Require Ethical Safeguards

The strong simulated effect associated with healthy defaults illustrates both their potential and their ethical sensitivity. A default is influential precisely because many consumers accept a preselected configuration. This effectiveness creates a responsibility for designers to ensure that default options are defensible and easily reversible.

In food environments, appropriate defaults should not disregard allergies, medical requirements, religious practices, cultural preferences, or individual dietary needs. Interfaces should make substitution visible, immediate, and financially transparent. A healthy default should therefore function as a suggestion rather than a hidden constraint.

Perceived autonomy remained positively associated with acceptance of the ordering environment. This suggests that behavioral effectiveness and autonomy do not necessarily conflict. Consumers can accept guidance when they retain practical control. The ethically problematic condition is not influence itself but influence that exploits opacity, confusion, or disproportionate switching costs.

6.3 Implications for Restaurants and Digital Ordering Platforms

For restaurants, cafeterias, food-delivery platforms, and institutional dining systems, the findings suggest that healthier-food strategies should be incorporated into menu architecture rather than confined to educational messages. Prominent placement, clear categorization, sensible defaults, and concise nutritional cues can make healthier options easier to process at the moment of decision.

Businesses should nevertheless avoid evaluating such interventions only through immediate sales. A responsible implementation should also consider customer satisfaction, opt-out behavior, repeat usage, perceived autonomy, dietary inclusivity, and whether changes unintentionally disadvantage particular groups. Transparent A/B testing in real ordering systems could determine which interventions improve healthy selection while maintaining customer acceptance.

Commercial incentives also require attention. Platforms frequently prioritize products based on margins, sponsorship arrangements, popularity, or predicted conversion. Health-oriented choice architecture may conflict with these objectives if highly promoted foods are nutritionally weaker. Responsible platform governance should therefore make clear whether ranking systems are designed around commercial performance, customer preference, nutritional objectives, or combinations of these goals.

7. Conclusion

This study developed a simulation-based framework for examining how choice architecture may influence healthier food ordering. The analysis compared a standard menu, healthy-item prominence, a modifiable healthy default, and a combined architecture incorporating several noncoercive behavioral interventions. Simulated healthy-selection rates increased from 34.8% under the conventional menu to 67.3% under the combined condition, illustrating the potential behavioral importance of seemingly modest design decisions.

Healthy defaults produced the strongest simulated direct intervention effect, followed by menu prominence and decision ease. Preference conflict reduced the likelihood of healthier selection, demonstrating that choice architecture does not eliminate individual preferences. Perceived autonomy remained positively associated with acceptance, reinforcing the view that effective nudging should not depend on making alternative choices unnecessarily difficult.

The principal practical implication is that food-ordering systems should be evaluated not only according to the options they contain but also according to the architecture through which those options are presented. Restaurants and digital platforms inevitably structure customer decisions through placement, ordering, defaults, visual prominence, and navigation. Designing these features responsibly can make healthier choices easier without transforming recommendations into mandates.

The study remains limited by its synthetic design. The reported percentages and coefficients should not be interpreted as population estimates or evidence from actual restaurant customers. Future research should employ randomized field experiments, controlled digital-menu studies, transactional ordering records, and longitudinal designs. Particularly useful extensions would compare default effectiveness across food categories, price levels, age groups, cultural settings, and levels of health motivation. Researchers should also examine whether repeated exposure produces sustained dietary improvements or whether customers gradually adapt and override the intervention. Such empirical work can determine how behavioral design can contribute responsibly to healthier food environments while protecting consumer agency and diversity of preference.

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