

Complete Title: Online Randomized Experiment Evaluating Eco-Labels on Restaurant Menus

Short Title: Eco-labels on Restaurant Menus

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Protocol Synopsis

Study Title	Online Randomized Experiment Evaluating Eco-Labels on Restaurant Menus
Funder	Harvard Pilgrim Health Care Institute Department of Population Medicine Faculty grant
Clinical Phase	NA
Study Rationale	<ul style="list-style-type: none">• Food retailers are increasingly using eco-labels to market the foods they sell.• These labels could be a promising strategy for informing consumers about sustainable food options and reducing consumption of less-sustainable foods.• However, the effect of these labels on the nutritional quality of consumers' food choices remains largely unknown.
Study	Primary
Objective(s)	<ul style="list-style-type: none">• To evaluate whether eco-labels improve the healthfulness of consumers' selections of entrees and appetizers compared to a control arm (no labels).
	Secondary
	<ul style="list-style-type: none">• Secondary objectives are detailed in the Statistical Considerations section.
Study Design	Randomized experiment.
Subject	Inclusion Criteria
Population	<ol style="list-style-type: none">1. Age 18 and older
key criteria for and Exclusion:	<ol style="list-style-type: none">2. Reside in the United States3. Able to complete a survey in English
	Exclusion Criteria
	<ol style="list-style-type: none">1. Under the age of 182. Reside outside of the United States3. Unable to complete a survey in English
Number of Subjects	3,100 US adults, with an oversample of young adults ages 18-29 (half of total sample)
Study Duration	Each subject's participation will last approximately 20 minutes. The enrollment period is expected to last 1 week.
Study Phases	There are two phases: (1) <u>Screening</u> : screening for eligibility and obtaining consent and (2) <u>Intervention</u> : study intervention/experimental treatment.

Efficacy Evaluations	<p>The primary outcome is the healthfulness of entrees and appetizers selected by participants, assessed using the United Kingdom's OfCom Nutrient Profiling Model Score.</p> <p>The secondary outcomes are detailed in the Statistical Considerations section.</p>
Statistical and Analytic Plan	<p>Primary outcome</p> <ul style="list-style-type: none"> • We will use linear regression to examine the effect of the eco-labels on the healthfulness of entrees and appetizers selected compared to the control arm (no label). • We will perform moderation analyses assessing whether the effect of the eco-labels on healthfulness of entrees and appetizers selected differ by 1) age group (young adult vs. older adults) or 2) interest in environmental sustainability. <p>Secondary outcomes</p> <ul style="list-style-type: none"> • We will use linear regression to examine the effect of the eco-labels on secondary outcomes that are continuous variables, compared to control. • We will use logistic regression to examine the effect of the eco-labels on secondary outcomes that are dichotomous variables, compared to control. • We will descriptively report participants' reactions to the eco-label.
Data and Safety Monitoring Plan	<ul style="list-style-type: none"> • The principal investigators are responsible for data quality management and ongoing assessment of safety.

Introduction

The goal of the analyses is to examine whether eco-labels improve the healthfulness of participants' entrée and appetizer selections from a restaurant menu using data collected from an online randomized experiment. This analysis plan pre-specifies the analyses before collecting data and therefore serves as our ex-ante planned analysis.

Study Protocol

Participants will complete an online randomized experiment programmed in Qualtrics. After providing informed consent, participants will be randomized to 1 of 2 arms: 1) eco-label or 2) control. In the eco-labels arm, participants will view a mock restaurant menu based on a popular US sit-down restaurant with an eco-label next to each of the more sustainable menu items. In the control arm, participants will view the same restaurant menu without the eco-label. Participants will be instructed to select the item or items they would like to order from the restaurant. We will record participants' selections from the menu. After completing the ordering task, participants will complete an online survey about their perceptions of the eco-label.

Statistical Considerations

General Principles

We will use a two-sided critical alpha of 0.05 to conduct all statistical tests. All confidence intervals presented will be 95% and two-sided. We will use complete case analysis to handle any missing data in analyses of the primary and secondary outcomes.

Primary Outcome

The primary outcome is the healthfulness of participants' entrée and appetizer selections, calculated as the average Ofcom Nutrient Profiling Model (NPM) score of the entrees and appetizers the participants select in the restaurant ordering task.

Hypothesis 1. We hypothesize that participants in the ecolabel arm will have healthier entrée and appetizer selections (i.e., lead to higher Ofcom NPM scores) than participants in the control arm.

Secondary Outcome

Menu selection outcomes:

- Healthfulness of participants' selections across all restaurant items (calculated as the average of the Ofcom NPM score of menu items selected by participants)
- Calories of all items selected
- Calories of entrees and appetizers selected
- Sodium of all items selected
- Sodium of entrees and appetizers selected
- Saturated fat of all items selected
- Saturated fat of entrees and appetizers selected

- Sugar of all items selected
- Sugar of entrees and appetizers selected
- Fiber of all items selected
- Fiber of entrees and appetizers selected
- Protein of all items selected
- Protein of entrees and appetizers selected
- Carbon footprint of all items selected
- Carbon footprint of entrees and appetizers selected

Noticing:

- Noticing of the eco-label

Cognitive elaboration

- Thinking about the environmental effects of food
- Thinking about the healthfulness of food
- Thinking about the taste of food

Menu item perceptions:

- Perceived sustainability of sustainable items
- Perceived healthfulness of sustainable items
- Perceived tastiness of sustainable items
- Perceived sustainability of unsustainable items
- Perceived healthfulness of unsustainable items
- Perceived tastiness of unsustainable items

Reactions to the eco-label:

- Liking of the eco-label
- Wanting to see the eco-label on restaurant menus
- Label helpfulness in choosing more environmentally sustainable foods
- Perceptions of control over making sustainable eating decisions

Statistical Methods

1. Analyses of the primary outcome:

- a. We will use linear regression to **evaluate the effect of the eco-labels on the healthfulness of participants' entrée and appetizer selections.** We will regress healthfulness of participants' selected entrees and appetizers on an indicator variable for trial arm. The control arm (no label) will serve as the referent. Hypothesis 1 will be supported if the coefficient on the eco-label arm is positive and statistically significant.

- b. We will perform two separate moderation analyses assessing whether the effect of the eco-labels on healthfulness of entrees and appetizers selected differ by 1) age group (young adult [18-29 years] vs. middle and older adults [30 years and older]) or 2) interest in environmental sustainability (GREEN scale,¹ treated continuously). We will regress the primary outcome on an indicator variable for trial arm, the moderator, and the interaction between trial arm and the moderator.
2. Analyses of the secondary outcomes:
 - a. We will use linear regression to **evaluate the effect of ecolabels on the continuous secondary outcomes** (i.e., menu selection outcomes, cognitive elaboration outcomes, and menu item perceptions). In separate regressions, we will regress each secondary outcome on an indicator variable for trial arm. The control arm will serve as the referent.
 - b. We will use logistic regression to **evaluate the effect of the eco-labels on binary secondary outcomes** (i.e., noticing). We will regress noticing on an indicator variable for trial arm. The control arm will serve as the referent.
 - c. We will **descriptively report participants' reactions to the eco-label**. First, we will dichotomize responses into agree (scores 4 or 5) vs. disagree or neutral (scores 1-3). Then, we will estimate the proportion of participants who agreed with each outcome (e.g., liked the eco-labels, etc.).

Sample Size Needs

We plan to collect data from national convenience sample of 3,100 US adults, with an oversample of young adults ages 18-29 (50% of total sample). Power analyses in G*Power² indicated that a sample size of 3,100 will provide 90% power to detect a standardized mean difference between the eco-label vs. the control arm of Cohen's $d=0.12$ or larger. This estimate of effect size is conservative based on prior studies of environmental²⁻⁴ and health⁵⁻⁷ labels.

Exclusions and Outliers

We will exclude participants who complete the survey implausibly quickly (defined as <1/3 of the median completion time).

References

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