

**Impact of Environmental Nudges on Dietary Quality
Hypotheses and Analytic Plan
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Hypotheses

The overall purpose of this study is to evaluate the impact of a suite of environmentally focused nudges on the nutritional quality of consumers' food selections.

Primary Outcome

The primary outcome is the healthfulness of product selections, operationalized as Nutri-Score scores.

We hypothesize that compared to the control arm (no eco-labels, swaps, or peer comparisons on products), the experimental arm (eco-labels, swaps, and peer comparisons on products) will lead to improved healthfulness of product selection.

Secondary Outcomes

The secondary outcomes are as follows: carbon footprint of selections [operationalized as products' greenhouse gas emissions (GHGE) per 100g]; acceptability of eco-labels, swaps, and peer comparisons; thinking about health, cost, taste, and environmental sustainability during the shopping task; perceived healthfulness and sustainability of sustainable and unsustainable items; purchase intentions for sustainable and unsustainable items; injunctive norms; and descriptive norms.

We hypothesize that the experimental arm will lead to:

Environmental

- A) Lower carbon footprint from selections (operationalized as GHGE per 100g)

Psychological

- B) Higher acceptability of eco-label intervention
- C) Higher acceptability of swaps intervention
- D) Higher acceptability of peer comparison intervention
- E) Higher thinking about the health of food products
- F) Higher thinking about cost of food products
- G) Higher thinking about taste of food products
- H) Higher thinking about environmental sustainability of food products
- I) Higher perceived healthfulness of sustainable items
- J) Higher perceived sustainability of sustainable items
- K) Lower perceived healthfulness of unsustainable items
- L) Lower perceived sustainability of unsustainable items
- M) Higher intention to purchase sustainable items
- N) Lower intention to purchase unsustainable items
- O) Stronger injunctive and descriptive norms to buy sustainable items

Statistical Considerations

Statistical Methods

The study is a randomized controlled trial. The analysis will rely on random assignment to identify the effect of front-of-package eco-labels, swaps, and peer comparisons on consumer choices compared to the control arm.

We will descriptively report unadjusted values for primary and secondary outcomes. We will use a two-sided critical alpha of 0.05 to conduct all statistical tests. Per CONSORT guidelines, we will not test for balance in covariates but will describe participant characteristics by trial arm. Primary analyses will be intent-to-treat, including all eligible participants with non-missing data for the outcome being analyzed.

For the primary, secondary, and other outcomes, we will assess whether the outcomes vary by study arm using linear regressions.

Because all analyses are pre-specified and each analysis only compares treatment to control (vs. comparing multiple treatment arms to one another), we do not plan to adjust analyses for multiple comparisons.

Exploratory Analyses

We will examine whether the following participant characteristics moderate the intervention effects on the primary outcome:

- a. Gender
- b. Educational attainment
- c. Income
- d. Frequency of red meat intake
- e. Political orientation
- f. Interest in sustainability

To test whether these characteristics moderate the effect of each intervention on healthfulness of product selection, we will fit a series of linear regression models (one for each potential moderator), with trial arm, the moderator, and their interaction as predictors.

Sample Size and Power

This is the first study to our knowledge to test the effects of environmental nudges on healthfulness of food selections. Thus, we powered the study to detect a small standardized effect of Cohen's $d=0.15$. The target sample size of 2,000 (1,000 per arm) provides 90% power to detect a difference in means between the experimental and control arms of $d=0.15$ or larger, assuming $\alpha=0.05$.

Outliers and Exclusions

The response scale does not permit outliers. We will exclude participants who complete the survey in $<1/3$ of the median completion time.