# Studying the impact of product packaging in a virtual store environment

## Hypotheses and Analytic Plan

**NCT #04381481**

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## Sample size

We will collect survey responses until ~2,175 adult (18 years and older) participants residing in the United States have completed the survey. Participants will be parents of children ages 1-5, whose child consumed at least one fruit drink in the past week. About one-third of the sample will be white, non-Hispanic; one-third of the sample will be black, non-Hispanic; and, one-third of the sample will be any race(s), Hispanic.

## Interim analysis

No interim analyses are planned.

## Task 1

### Predictions

The aim of Task 1 is to examine how nutrition claims on fruit drink packaging influence US parents' selections, perceptions, and reactions. We have the following predictions:

1. Parents who see a nutrition claim on a fruit drink will be more likely to select the fruit drink (versus 100% fruit juice) than those who do not see a nutrition claim (primary outcome)
2. Parents who see a nutrition claim on a fruit drink will be more likely to select the fruit drink (versus water) than those who do not see a nutrition claim
3. Nutrition claims will lead to greater perceived appeal of fruit drinks
4. Nutrition claims will lead to greater interest in giving fruit drinks to one's child
5. Nutrition claims will lead to greater interest in consuming fruit drinks
6. Parents who see a nutrition claim will be more likely to hold the misperception that the fruit drink is 100% fruit juice
7. Parents who see a nutrition claim will be more likely to hold the misperception that the fruit drink does not have added sugar
8. Nutrition claims will lead to lower estimates of the amount of added sugar people think the product contains
9. Nutrition claims will lead to higher estimates of the percentage of fruit juice people think the product contains
10. Nutrition claims will lead to lower perceived harm of fruit drinks compared to soda
11. Nutrition claims will lead to lower perceived harm of fruit drinks compared to 100% fruit juice
12. Nutrition claims will lead to greater misleadingness of the product packaging

### Analyses

We will report descriptive results for all outcomes (i.e., means and proportions by group). In all models, the predictor will be a dummy variable indicating whether the participant was randomized to one of the three intervention nutrition claim conditions. For predictions with Likert-style outcomes, we will run linear regression models, one for each outcome. We will examine skewness of the residuals and run ordinal models in sensitivity analyses if residuals

are skewed, retaining the linear models if the pattern of results does not change. For predictions with dichotomous outcomes, we will use the same approach except with logistic regression. We will use the margins command in Stata for significance testing of control vs. each claim separately, as well as each claim compared to the other claims.

We will also report results when controlling for any participant demographic characteristics (including random assignment to two experiments conducted after the primary outcome, but before measurement of some of the secondary outcomes) found to be unbalanced across treatment arms in balance tests, if these results differ substantively from unadjusted results (i.e., changes in statistical significance or direction of effect).

We will examine whether the following participant characteristics moderate the effect claims on the primary outcome:

a) Age of child shopping for (in years);
b) Gender of parent (man vs. woman);
c) Gender of child (boy vs. girl);
d) Race/ethnicity of parent (White non-Hispanic vs. Black non-Hispanic vs. Hispanic);
e) Low educational attainment (dichotomized based on sample distribution);
f) Household income (dichotomized based on sample distribution);
g) Child's frequency of consuming fruit drinks (above vs. at or below the sample median);
h) Time spent looking at Nutrition Facts Panel of the beverage;
i) Seeking vitamin C since COVID-19 pandemic

To test whether these characteristics moderate the effect of claims on selection, we will fit a series of logistic regressions models (one for each potential moderator), with trial arm, the moderator, and their interaction as predictors. We will probe significant interactions by calculating the marginal effect of nutrition claims on the outcome at different levels of the moderating variable.

We will use a critical alpha of 0.05 and statistical tests will be two-tailed. We will correct for multiple comparisons.

## **Task 2**

Predictions

The aim of Task 2 is to examine how sugar warnings on granola snack packaging influence US parents' selections, perceptions, and reactions. We have the following predictions:

1. Parents who see a warning message on a high-sugar granola snack will be more likely to select the lower-sugar snack than those who see a control message.
2. Sugar warnings will lead to lower perceived appeal of high-sugar granola snacks.
3. Sugar warnings will lead to lower intent to give a high-sugar granola snack to one's child.
4. Sugar warnings will lead to lower intent to purchase a high-sugar granola snack.
5. Sugar warnings will lead to lower intent to consume a high-sugar granola snack.
6. Sugar warnings will lead to lower perceptions of healthfulness of a high-sugar snack for one's child to consume.
7. Parents who view sugar warnings will rate them as having higher perceived message effectiveness than parents who view the control label.

8. Parents who view sugar warnings will be more likely to talk about them with others in the next week than parents who view the control label.
9. Parents who view sugar warnings will be more likely to report that they learned something new from the label than parents who view the control label.
10. Parents who view sugar warnings will rate them as grabbing their attention more than parents who view the control label.
11. Parents who view sugar warnings will rate them as making them feel scared more than parents who view the control label.
12. Parents who view sugar warnings will rate them as making them think about the health problems caused by eating the snack more than parents who view the control label.
13. Sugar warnings will lead to greater accuracy in identifying which of two snacks is higher in added sugar.
14. Sugar warnings will lead to greater accuracy in identifying which of two snacks is healthier for one's child to consume.
15. Sugar warnings will lead to lower intentions to buy the higher-sugar snack for one's child (vs. the lower sugar snack).

Analyses

We will report descriptive results for all outcomes (i.e., means and proportions by group). In all models, the predictor will be a dummy variable indicating whether the participant was randomized to one of the two warning message conditions. For predictions with Likert-style outcomes, we will run linear regression models, one for each outcome. We will examine skewness of the residuals and run ordinal models in sensitivity analyses if residuals are skewed, retaining the linear models if the pattern of results does not change. For predictions with dichotomous outcomes, we will use the same approach except with logistic regression. We will use the margins command in Stata for significance testing of control vs. each warning message separately, as well as each warning message compared to each other. We will also report results when controlling for any participant demographic characteristics (including random assignment to experiments conducted before the primary outcomes) found to be unbalanced across treatment arms in balance tests, if these results differ substantively from unadjusted results (i.e., changes in statistical significance or direction of effect).

We will examine whether the following participant characteristics moderate the effect claims on the primary outcome:

a) Age of child shopping for (in years);
b) Gender of parent (man vs. woman);
c) Gender of child (boy vs. girl);
d) Race/ethnicity of parent (White non-Hispanic vs. Black non-Hispanic vs. Hispanic);
e) Low educational attainment (dichotomized based on sample distribution);
f) Household income (dichotomized based on sample distribution);
g) Time spent looking at Nutrition Facts Panel of the snack;

To test whether these characteristics moderate the effect of warning messages on selection, we will fit a series of logistic regressions models (one for each potential moderator), with trial arm, the moderator, and their interaction as predictors. We will probe significant interactions by calculating the marginal effect of sugar warnings on the outcome at different levels of the moderating variable.

We will use a critical alpha of 0.05 and statistical tests will be two-tailed. We will correct for multiple comparisons.