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Effects of Cigarette and E-cigarette flavors on Substitutability in the Experimental Tobacco Marketplace (20-008)

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Confidentiality Statement:

This document does not contain names of research participants.

Statistical Analysis Plan

Demographic characteristics (e.g., age, race, income) and smoking-related assessments (e.g., FTCD, QSU, PHR) were described using mean, standard deviation, and percentages. For each of the product categories in the ETM, we sought to determine if the policy restrictions differentially impacted cigarette, e-cigarette, oral tobacco and nicotine products, and NRT product purchasing. We used a hierarchical linear regression to evaluate differences in purchase behavior, which considered a three-way interaction among the cigarette policy condition, the e-cigarette policy condition, and the price of the manipulated commodity (log-transformed), and a random effect for the participant. We performed model selection to determine which set of variables (i.e., cigarette policy condition, the e-cigarette policy condition, and the price of manipulated commodity), which interactions among these variables, and the degree of these interactions were supported by the data. Specifically, we performed an exhaustive search of the model space and selected the optimal model as that with the lowest Bayesian Information Criterion (BIC). Model posterior probabilities (PP) were calculated using the BIC as described in Barbieri and Berger [29]. We opted to use the BIC to evaluate model performance because the BIC is model selection consistent. Model summary statistics are reported using Type III sum of squares and Kenward-Roger degrees of freedom [30]. R software Version 4.3.0 was used for all data analysis [31]. All statistical tests were considered significant at the < 0.05 level.

Sample size calculation

The required sample size was calculated a priori. Considering a within-subject Analysis of Variance (ANOVA), where each subject completes all 4 policy conditions, a medium effect size ($f=0.25$) according to Cohen's 1988 conventions, an alpha of 0.05, and 80% power, a total of 24 individuals are required. This calculation was done using G*Power and considered a correlation among repeated measures of 0.5.