Investigating the Substitutability of Alternative Nicotine and Tobacco Products for Conventional Cigarettes in an Experimental Tobacco Marketplace among Vulnerable Populations

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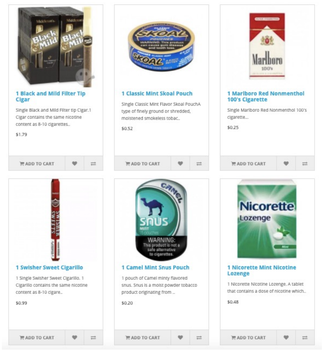
Background

Experimental Tobacco Marketplace (ETM)

- Virtual storefront wherein the price, availability, and/or product labeling may be manipulated
- Examine cigarette demand as a function of increasing price
- Examine substitutability of other fixed-price alternative products
- Can model potential regulatory policies in a simulated real-world tobacco marketplace in which a diverse variety of products are available



Purpose

- Determine cigarette demand and the substitutability of JUUL and cigarillos/little cigars (LCCs) as a function of increasing cigarette price among adult daily smokers from populations particularly vulnerable to smoking

Method

- Assigned an account balance based on weekly cigarette consumption
- Made purchases for 5 days worth of products
- Price of usual brand cigarette increased
- Price of alternative products remained fixed: JUUL pods, LCCs, Skoal, Snus, gum, & lozenges

- Within-Subject, 3 sessions
  1. All products available
  2. LCCs unavailable
  3. JUUL pods unavailable

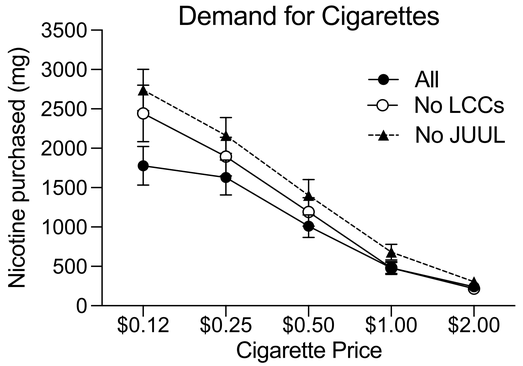
Data Analysis

- Products purchased converted to total mg of nicotine
- Linear regression performed mean data as a function of log-transformed cigarette price

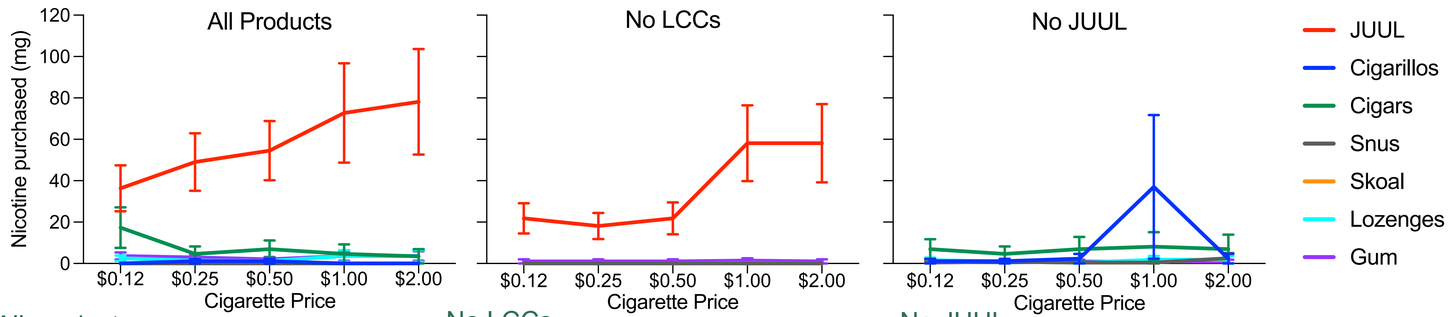
Results

Cigarette Demand

- Cigarette purchasing decreased as a function of price (slope ≠ 0)
  - All products available
    - $F(1, 3) = 81.48$, $\mathbf{p = .003}$*, $R^2 = .96$
  - No Cigars
    - $F(1, 3) = 173.14$, $\mathbf{p = .001}$*, $R^2 = .98$
  - No JUUL
    - $F(1, 3) = 288.16$, $\mathbf{p = .0004}$*, $R^2 = .99$
- Average demand intensity trended in the direction of lowest when all alternative products were available, intermediate when LCCs were unavailable, and highest when JUUL was unavailable, but not significantly ($p = 0.15$)



Alternative Product Substitutability



All products
JUUL substituted for cigarettes
$F(1, 3) = 106.48$, $\mathbf{p = .002}$*, $R^2 = .97$

No LCCs
JUUL purchases increased but not quite a significant substitute
$F(1, 3) = 8.51$, $\mathbf{p = .06}$, $R^2 = .74$

No JUUL
Cigars did not function as a substitute for cigarettes
$F(1, 3) = 0.67$, $\mathbf{p = .47}$, $R^2 = .18$

Discussion

- The current study replicates previous work with the ETM by demonstrating the substitutability of ENDS for combustible cigarettes
- Extends this work to populations especially vulnerable to smoking
- Across all sessions, cigarette purchases decreased as a function of increasing price
- Some evidence to suggest that demand intensity may vary by product availability
- JUUL was the preferred substitute when constraints on combusted cigarettes increased
- Thus, JUUL availability could be an important consideration for tobacco regulatory policies on conventional cigarettes
  - E.g., Reduced nicotine content standard for cigarettes
- No evidence that LCCs substituted for cigarettes but that observation should be interpreted cautiously pending further investigation