Perceptions of Nicotine and Tobacco Products in the US Adult Population – A Latent Class Analysis

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— FAMILY OF COMPANIES —

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ACCURATE PERCEPTIONS about relative harm are associated with switching behaviors among US adults who smoke

THOSE WITH ACCURATE PERCEPTION:

DUAL USE[1]
(cigarettes and e-cigarettes)

More likely to transition to exclusive e-cigarette use
OR=2.9, 95% CI=1.7, 4.8

Less likely to transition to exclusive cigarette smoking
OR=0.6, 95% CI=0.5, 0.7

SMOKED CIGARETTES

More likely to adopt ENDS
aOR 1.31; 95% CI=1.15, 1.50

Switch completely to ENDS
aOR 2.24; 95% CI=1.89, 2.65

SMOKERS WHO SWITCHED[2]
(within the past year)

Avoidance of resumption of smoking in the next wave
aOR 0.55; 95% CI=0.33-0.93

aOR=adjusted odds ratio; CI=confidence interval; OR=odds ratio.
1. PATH wave 2 & 3; Persoskie et al. 2019. 2. PATH wave 4 & 5; Kim et al., 2022.

PERCEPTION:

Change to accurate relative harm perceptions was associated with smoking reduction among US adults who smoke[1]

Inaccurate to Accurate

Decreased number of days smoked
–2.1, 95% CI = 3.5, -0.6

Increased number of days using e-cigarettes
5.3, 95% CI = 2.6, 8.0

Accurate to Inaccurate

No significant change in days smoked
0.6, 95% CI = -0.04, 1.3

No significant change in days using e-cigarettes
–2.1, 95% CI = -4.3, 0.1

Individuals with accurate perceptions about nicotine
are more likely to use ENDS or consider switching among adults who smoke[2]
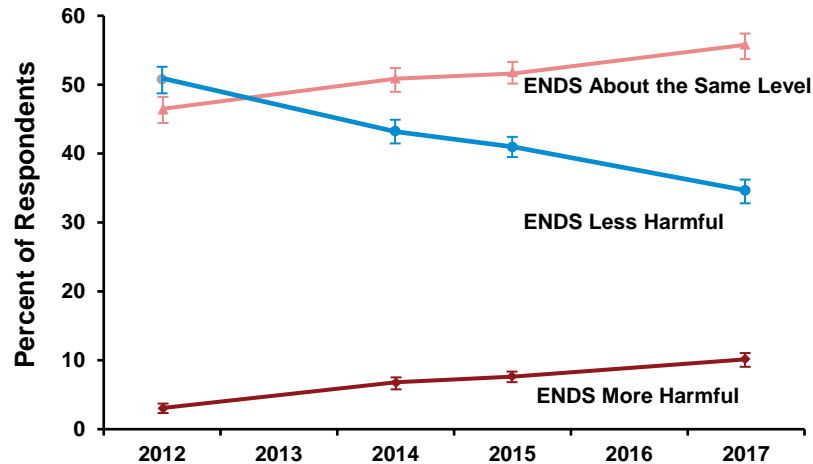
1. Persoskie et al. 2019. 2. Weiger et al. 2022.

Background

Misperceptions about Nicotine and the Relative Harm of E-cigarettes are Common Among US Adults
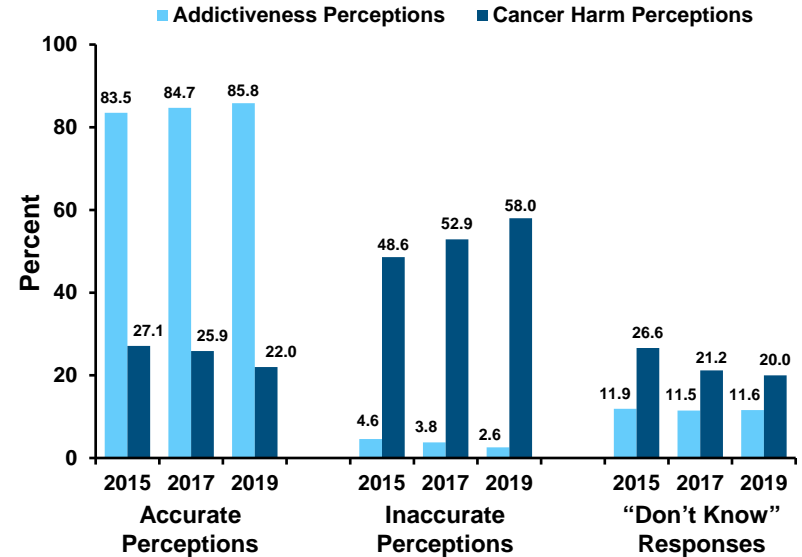
Perceived Harm of Electronic Cigarettes Relative to Combustible Cigarettes
Health Information National Trends Surveys[1]

Perceived Addictiveness and Cancer Harm of Nicotine in Relation to Nicotine
(Health Information National Trends Survey, 2015, 2017, & 2019)[2]

1. Huang et al., 2019. 2. Peterson et al., 2023.

ACCURATE PERCEPTIONS
about nicotine and relative harm of e-cigarettes are higher among:

- ✓ Men
- ✓ Younger age
- ✓ Non-Hispanic White

- ✓ Higher income levels
- ✓ Higher education levels
- ✓ Had used tobacco

Source: Rubenstein et al., 2023; Kim et al, 2022; Villanti et al, 2019; O'Brien et al, 2017; Byron et al, 2019.
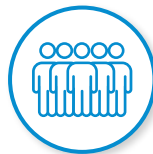
Rationale and Aim

Literature Shows

PERCEPTIONS
are correlated

SIMILARITIES
in demographic correlates

SIMILARITIES
in association with
tobacco use patterns

Research Questions

Are there population subgroups with **different perceptions of nicotine and harm of tobacco products** when assessed jointly?

If so, are there **differences in demographic characteristics and tobacco use history** across these groups?

Methods

STUDY POPULATION

US adults 18+

STUDY DESIGN

Cross-sectional household survey

DATA SOURCE

PATH wave 4 (n=23,739)

ASSESSMENT

ACASI

ASSESSMENT PERCEPTIONS

about nicotine and tobacco products

ACASI

ANALYSIS

Latent class analysis

Generalized linear regression

Items Included in the LCA

DOMAIN	SURVEY QUESTION	RESPONSE OPTIONS
Nicotine	1. Do you believe nicotine is the main substance in tobacco that makes people want to use tobacco products? 2. Do you believe nicotine is the chemical that causes most of the cancer caused by smoking cigarettes?	**Definitely yes** **Probably yes** Probably not Definitely not
	3. How harmful do you think nicotine is to health? 4. How harmful do you think the nicotine in cigarettes is to health? 5. How harmful do you think the nicotine in e-cigarettes or other electronic nicotine products is to health?	**Not at all harmful** **Slightly harmful** **Somewhat harmful** Very harmful Extremely harmful
Harm to Health	6. How harmful do you think cigarettes are to health? 7. How harmful do you think e-cigarettes or other electronic nicotine products are to health? 8. How much do you think people harm themselves when they smoke cigarettes some days but not every day? 9. How much do you think people harm themselves when they use e-cigarettes or other electronic nicotine products on some days but not every day?	**No harm** **A little harm** **Some harm** A lot of harm
Relative Harm to Health	10. Is using e-cigarettes or other electronic nicotine products less harmful, about the same, or more harmful than smoking cigarettes?	**Less harmful** About the same More harmful

Response options to all questions included "Don't know" and "refused," which were coded as missing values.

Results

Question 1 – Are There Population Subgroups?

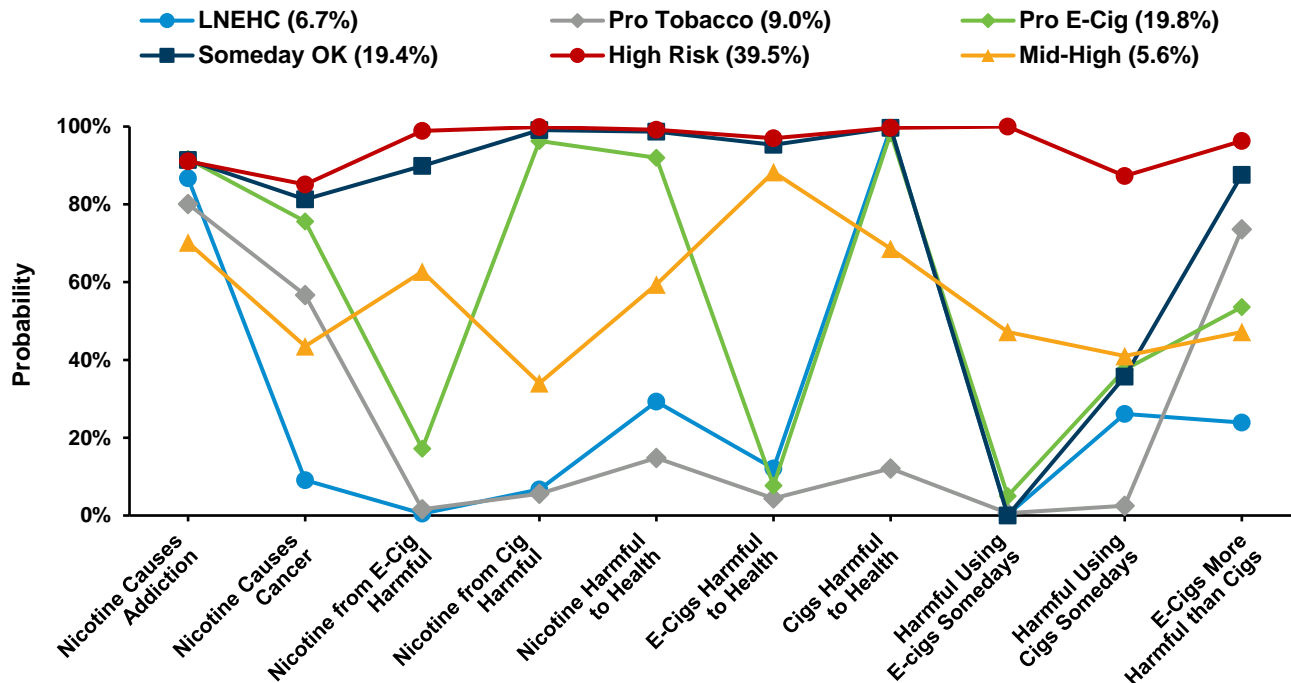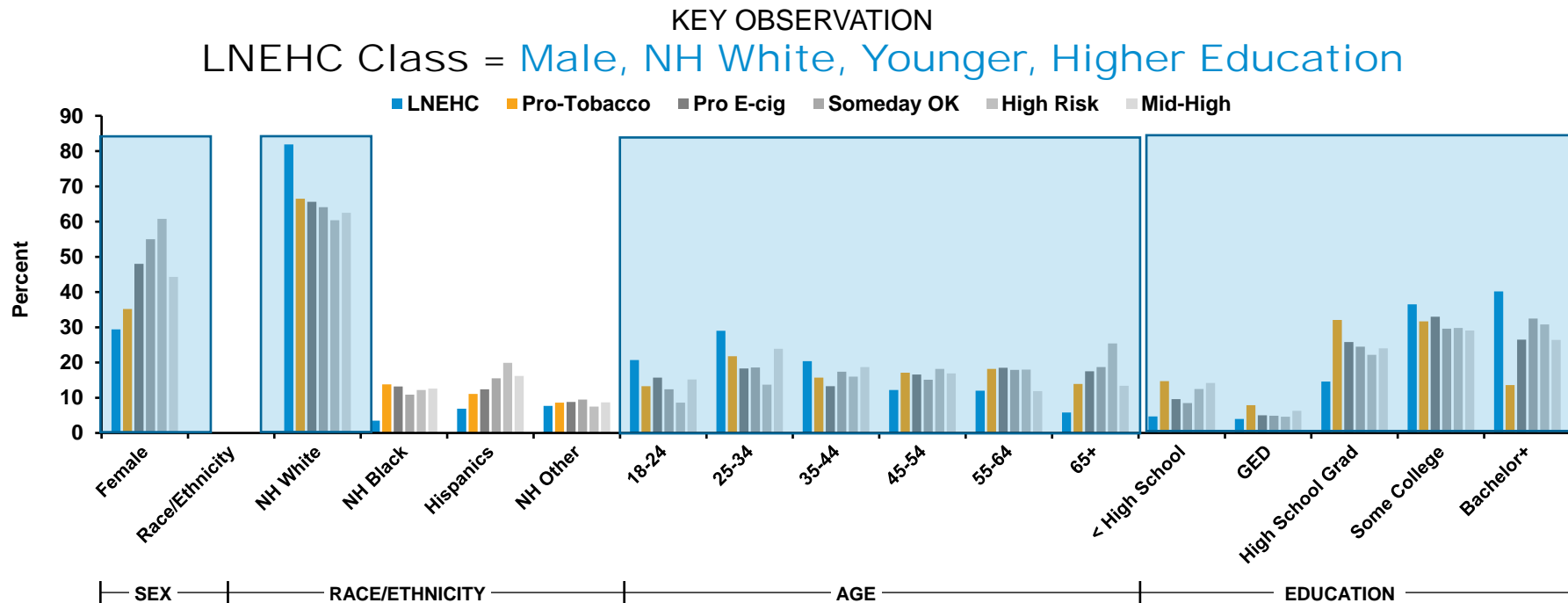|	
LNEHC	Low risk of nicotine and e-cig and high risk of cigarettes
PRO-TOBACCO	Low risk of e-cig and cigarettes
PRO–E-CIG	Low risk of e-cig and high risk of cigarettes
SOMEDAY OK	Low risk of using e-cig or cigarettes someday
HIGH RISK	High risk of nicotine, e-cig, and cigarettes
MID-HIGH	Moderate likelihood of high risk of all items

Legend: LNEHC (6.7%), Pro Tobacco (9.0%), Pro E-Cig (19.8%), Someday OK (19.4%), High Risk (39.5%), Mid-High (5.6%)

Y-axis: Probability

X-axis categories: Nicotine Causes Addiction; Nicotine Causes Cancer; Nicotine from E-Cig Harmful; Nicotine from Cig Harmful; Nicotine Harmful to Health; E-Cigs Harmful to Health; Cigs Harmful to Health; Harmful Using E-cigs Somedays; Harmful Using Cigs Somedays; E-Cigs More Harmful than Cigs

Correlates – Demographic Characteristics

KEY OBSERVATION

LNEHC Class = Male, NH White, Younger, Higher Education
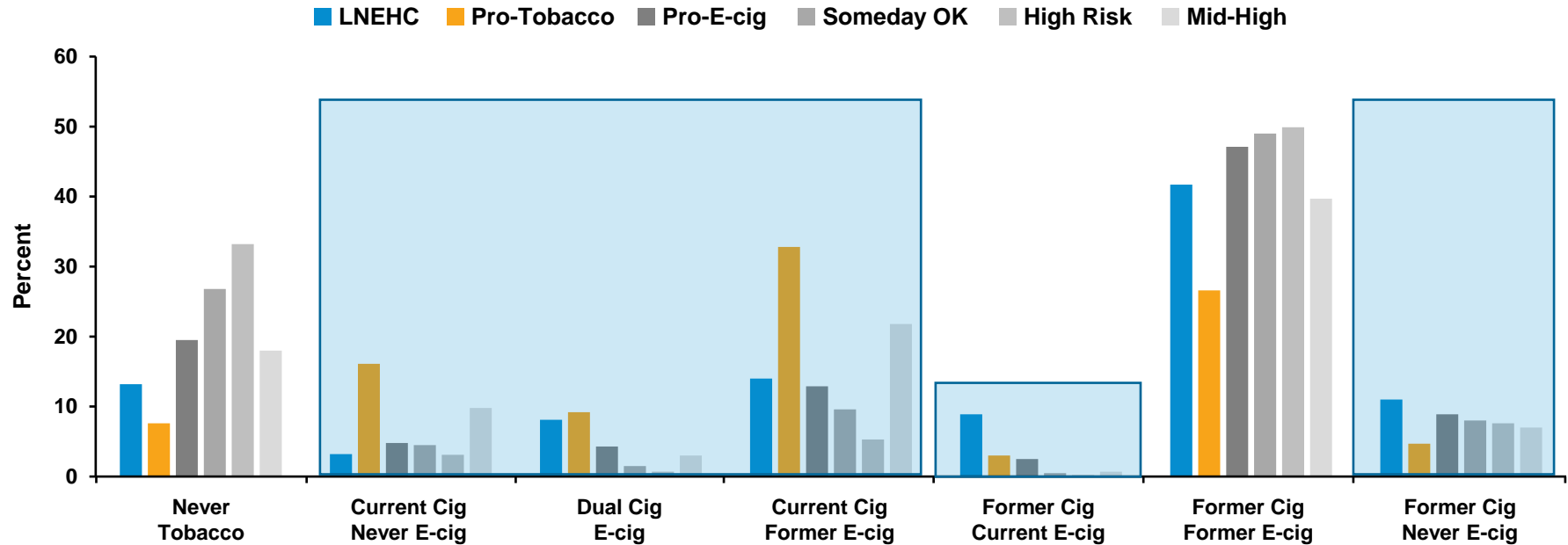
High Risk=high risk of nicotine, e-cig, and cigarettes; LNEHC=low risk of nicotine and e-cig and high risk of cigarettes; Mid-High=high risk of nicotine, e-cig, and cigarettes; NH=non-Hispanic; Pro–e-cig=low risk of e-cig and high risk of cigarettes; Pro-Tobacco=low risk of e-cig and cigarettes; Someday OK=low risk of using e-cig or cigarettes someday.

Correlates – Tobacco Use History

Legend: LNEHC, Pro-Tobacco, Pro-E-cig, Someday OK, High Risk, Mid-High

Categories: Never Tobacco, Current Cig Never E-cig, Dual Cig E-cig, Current Cig Former E-cig, Former Cig Current E-cig, Former Cig Former E-cig, Former Cig Never E-cig
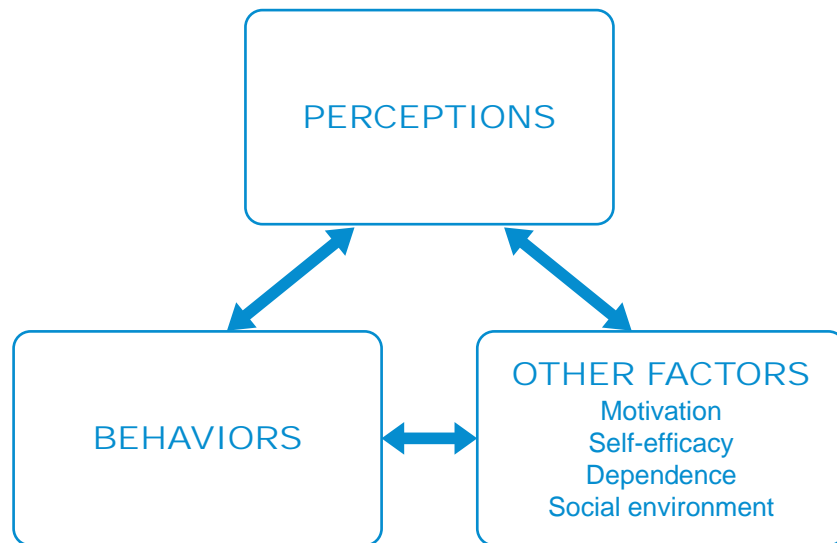
Y-axis: Percent (0–60)

High Risk=high risk of nicotine, e-cig, and cigarettes; LNEHC=low risk of nicotine and e-cig and high risk of cigarettes; Mid-High=high risk of nicotine, e-cig, and cigarettes; Pro–e-cig=low risk of e-cig and high risk of cigarettes; Pro-Tobacco=low risk of e-cig and cigarettes; Someday OK=low risk of using e-cig or cigarettes someday.

Discussion

✓ **Investigated perceptions of nicotine and tobacco products jointly**

✓ **Heterogeneous perception groups**

✓ **LNEHC is not common**

✓ **Tobacco use and perceptions**
Strong association between perceptions and tobacco use
Temporal relationship? Causation?

✓ **Disparity across demographic subgroups**

LNEHC=Low risk of nicotine and e-cig and high risk of cigarettes.

PERCEPTIONS

BEHAVIORS

OTHER FACTORS
Motivation
Self-efficacy
Dependence
Social environment

Strengths and Limitations

STRENGTHS

Nationally representative sample
Holistic approach on perceptions
More nuanced tobacco use history

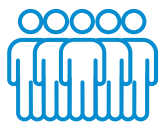**LIMITATIONS**

Observational
Cross-sectional

For the US adult population as a whole

✓ it is **uncommon to perceive** LOW risk of nicotine and e-cigarettes and HIGH risk of cigarette smoking

✓ **Perception subgroups are not evenly distributed** in the population

Concentrated among adults who had stopped smoking and currently using ENDS

Thank You
for your time today

Any questions?